PART-II AGENDA ITEMS FOR THE 69TH MEETING OF THE ACADEMIC COUNCIL SCHEDULED ON 16TH AND 17TH JUNE, 2003

3. RATIFICATION OF ACTION TAKEN BY THE VICE-CHANCELLOR:

i)	Declaration of Ph.D/M.Phil Results.	: 3:1(1)
ii)	Panel of Examiners for Ph.D/M.Phil.	: 3:2(1)
iii)	Panel of examiners for various papers of the subject of Computer Science.	: 3:3(1)

5. - ACADEMIC MATTERS:

5:1 - STATUTES/ORDINANCES/REGULATIONS AND RULES

iii)	Framing of Ordinances for Professional Courses - Committee's recommendation thereof.	: 5:1:3(1-8)
iv)	Second Conference of the Vice-Chancellor of Central Universities held on May 25-26,01 at IGNOU Campus, New Delhi.	: 5:1:4(1-6)
v)	Ordinance on Career Advancement Scheme for the University teachers.	: 5:1:5(1-2)
vi)	Guidelines for counting of past service for promotion from Reader to Professor under Career Advcement Scheme.	: 5:1:6(1-3)

5:2 - SYLLABUS:

ii)	Revised Syllabus for B.Sc. in Computer Science.	5:2:2(1-60)
iii)	Revised Syllabus for M.A. in Philosophy.	: 5:2:3(1-44)
iv)	Revised M.A.(Education) Syllabus.	: 5:2:4(1-55)
v)	Revised Syllabus for M.A./M.Sc Economics 2002.	: 5:2:5(1-3)
vi)	Syllabus of two Diploma Courses in 1) Visual Arts(Painting) and 2) Performing Arts(Music).	: 5:2:6(1-28)

5:3 - OTHERS:

iv)	Appointment of Rajiv Gandhi Chair.	: 5:8:4(1)

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Item No: 3 - Ratification of action taken by the Vice-Chancellor.

(i) Declaration of Ph.D/M.Phil Results.

The Respective School Board Considered and approved the following Ph.D/M.Phil results and the matter is placed before the Council for ratification.

Sl.No.	Name of the Candidate	Deptt.	Degree
1.	Ramongliana	Philosophy	Ph.D
2.	Juthsutho Phoji	-do-	-do-
3.	Sivasish Biswas	English	-do-
4.	Manti Venkat Raghu Ram	-do-	-do-
5.	Sheba M.Nongpoh	Khasi	M.Phil
6.	Hasting R.Kharkongor	-do-	-do-
7.	Homelin M.Bareh	-do-	-do-
8.	External B.Lytan	-do-	-do-
9.	Dapber Khongsngi	-do-	-do-
10.	Banylla Lapang	-do-	-do-
11.	Pyniarbor M.Tiewsoh	-do-	-do-
12.	Riana Nongbri	-do-	-do-
13.	Grace Darling	Philosophy	-do-
14.	Bendangrenla	-do-	-do-
15.	G.Sangchungnunga	-do-	-do-
16.	Simchi K.Marak	English	-do-
17.	Pranjal Sarma	Sociology	Ph.D
18.	Maushumi Bora	-do-	-do-
19.	R.Hmingthanzuala	Political Sc.	-do-
20.	Mr Varghese J Manathrachira,	Library & Information Science	Ph D
21.	Mr K L Ngullie,	Economics	Ph D
22.	Mr K Kumomo Chung	Economics	Ph D

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ii) Panel of Examiners for Ph D/M Phil.

The respective School Board considered and approved the panel of examiners in respect of the following candidates.

Sl No:	Name of the Candidates	Department	Degree
1.	Regina Thabor	Education	Ph D
2.	Sangeeta Angom	- do -	Ph D
3.	Saji Varghese	Philosophy	Ph D
4.	Aniruddha Burmon	English	Ph D
5.	John Joy Appathara	English	Ph D
6.	Barrylia M Wolfleng	Khasi	Ph D
7.	Sarabha Kharbangar	Khasi	Ph D
8.	Ms Sujata Dutta Hazarika	Sociology	Ph D
9.	Mr Andrew H Vanlaldika	Sociology	Ph D
10.	Mr K Rio	Economics	Ph D
11.	Mr Talitemsu Ao	Library and Information Science	Ph D
12.	Mr Lalhmachhuana	Library and Information Science.	Ph D
13.	Mr M Mezbah-Ul-Islam	- do -	Ph D
14.	Mr C Lalmuankima	Economics	Ph D
15.	Mr B Gogoi	Physics	Ph D
16.	Mr G S Chaubey	Chemistry	Ph D
17.	Mr A Malhotra	Chemistry	Ph D
18.	Piramita Das	Philosophy	M Phil.

SG

(ii) Panel of examiners for various papers of the subject of Computer Science.

The Board of Under-Graduate Studies in Computer Science in its meeting held on 19th May, 2003 considered and approved the panel of Examiners for B.Sc. in Computer Science which is pertaining the Under-Graduate examination.

The matter is placed before the Council for consideration.

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(iii) Framing of Ordinances for Professional Course - Committee's recommendation thereof.

In pursuance of the AC Resolution No.AC:68:2002:5:5(ii) which was held on 4th and 5th December,2002, a Committee was constituted by the Vice-Chancellor to look into the framing of Ordinance for B.E. and other professional courses constituting of Prof. A.N.Rai(as Chairman), Prof. K.Ismail(as Member) and D.R(Exam)(as Convener).

The above said Committee met on 7th April, 2003, and has recommended the necessary amendments/addendum on the Ordinance(OA5) as per Annexure(I), on the Ordinance(OC8) as per Annexure(II), and on the Ordinance(OA13) as per Annexure (III).

For clarity, it may be highlighted in brief that a single Ordinance for professional courses cannot be framed, since such professional courses are so varied and different in nature from each other. Therefore, the Committee has recommended to add one clause within the relevant Ordinances, so that once the professional courses have provision Clause(s) within the Ordinance, then the respective regulations for the respective professional course(s) can be framed and be legally valid.

Another matter relating to Ordinance(OA-13) an amendment is recommended on the title - "On Board of Studies for Professional Course" which has to be changed/ corrected as "On the Board of Post-Graduate Studies for Professional Courses", since the whole context under OA-13 is relevant only for the Post-Graduate level of studies.

Hence the proposed amendments and addendum are placed before the Council for its kind perusal and decision.

NO. F. DR/EX-ANRAI-COM.
(EXAM DEPTT).

ANNEXURE - I

Existing Ordinances	Proposed amendments/ addendum
OA-5 ON DEGREES,DIPLOMAS AND CERTIFICATES Under Section 26(1) of NEHU Act,1973 The following Degrees,Diplomas and Certificates in accordance with conditions, which may be laid down from time to time in each case by an Ordinance or otherwise, will be awarded by the University in accordance with the provisions of the Ordinances and Regulations if any, in each case:	No change
(i) Research Degrees of Master of Philosophy, Doctor of Philosophy, Doctor of Science, Doctor of Literature and Doctor of Law;	No change
(ii) Master's Degree in Arts,Sciences, Home Science,Commerce,Education, Law,Agriculture,Management Studies,Pharmacology,Medicine and Engineering;	No change
(iii) Bachelor's Degree(General and Honours) in Arts,Science, Commerce,Home Science,Pharmacology,Education,Agriculture, Medicine,Engineering and Law;	No change
(iv) Post Graduate Diploma in special branches of learning or practical skills,like Statistics,Planning, Public Administration,Electronics, Instrumentation;	No change
(v) Diploma in Civil,Mechanical and Electrical Engineering,Electronics, Agriculture and such other fields as may be approved by the Academic Council from time to time;	No change
(vi) Diplomas and Certificates in various Languages;	No change
(vii) Certificates in Arts,Science Commerce,Agriculture and other courses as may be approved by the Academic Council from time to time;	No change
(viii) Certificates in special branches of learning or practical skills, technical subjects,foreign languages,Statistics etc,;and	No change
(ix) Honorary Degrees.	No change The following be added as Clause X: (X) "Degrees(Masters and Bachelors)Diplomas and Certificates in various professionals Courses introduced by the University from time to time".

ANNEXURE - II

Existing Ordinances	Proposed ammendments/ addendum
OC-8 ON THE STRUCTURE OF BACHELOR OF ARTS,SCIENCE,HOME SCIENCE AND COMMERCE COURSES Under Section 26(1) (b) of the NEHU Act,1973	
Course of Study 1. There shall be courses of study leading to the Degrees of Bachelor of Arts,Bachelor of Science, Bachelor of Commerce(General or Honours).	No change
Eligibi-lity 2. Students who have passed the two years PU examination of NEHU or any other equivalent examination from any recognised University/Board shall be eligible to seek admission to the first year of the Degree course.However,with effect from the 1997 academic session the candidates desiring to opt for Honours shall be required to have obtained 45% marks in the concerned subject or 45% in the aggregate if that particular subject is not offered at the P.U.or equivalent level.	No change
Duration and Structure 3. The duration of the Degree courses with or without Honours shall be of three years.There shall be three examinations,the first being at the end of first year,the second being at the end of second year and the third being at the end of third year. However,with effect from the 1997 academic session there shall be two University Examinations only for the Three Year Degree Course,Part I falling at the end of the second year and covering the existing syllabi of the first and second year and Part II Examination at the end of the third year covering the existing third year sullabi without backlog facilities and with improved facility only on successful completion of the Part I and II Examinations.	No change
Division and Classes 4. In order to pass the Degree examination,a candidate shall obtain the following minimum marks:- (A) Candidates without Honours: (a) 30% marks in each theory paper (b) 40% marks in each practical paper wherever applicable. (c) A candidate securing 33% marks or more but less than 45% marksinn aggregate shall be declared to have qualified for the degree as Simple Pass;a candidate securing 45% marks or more but less than 60% in aggregate shall be placed in the Second Division and candidates securing 60% marks or more shall be placed in the First Division.	No change

...2...

Existing Ordinances	Proposed amendments/addendum
(B) Candidates with Honours:	No change
(a) 30% marks in each theory paper.	No change
(b) 40% marks in each practical paper.	No change
(c) A candidate securing 33% or more but less than 45% marks in aggregate in the Honours subjects shall be declared to have qualified for the degree as Simple Pass; a candidate securing 45% marks or morenbut less than 60% marks in aggregate in the honours subjects shall be placed in the Second Class and the candidates securing 60% marks or more in the honours subjects in aggregate shall be placed in the First Class.	
(C) Distinctions: A candidate obtaining 75% marks or more in a particular subject shall be awarded Distinction in that particular subject but a candidate shall be required to secure a minimum of 85% marks to obtain Distinction in G.F.C.	No change
Award of Degrees 5.(a)The candidates shall be eligible to get the Degree for the respective stream taking into account their performances in the three examinations namely,the examination at the end of the First Year,the examination at the end of the Second Year and the examination at the end of the Third Year. For the purpose of classification of divisions/classes, the aggregate of the marks obtained in all the three examinations shall be taken into account.	No change
However,for the candidates admitted with effect effect from the 1997 academic session,the candidates shall be eligible to get their degree for the respective stream taking into account their performances in the two examinations,namely,Part I and Part II Examinations. For the purpose of classification of divisions/ classes the aggregate of the marks obtained in the two part examination shall be taken into account.	No change
(b) Regardless of whether the candidates pass or fail in one or more subjects of the first and second year examination(s) shall be eligible to proceed to the next Year's course without having to wait for the declaration of the concerned result. However,a candidate failing in one or more subjects shall be required to appear and pass the subjects failed earlier availing subsequent two chances. A student shall have to clear the degree within 5 years from the date of admission to the Degree Course,beyond which a candidate shall be required to seek readmission into the first year as a fresh candidate.	No change
However,with effect from the 1997 academic session the candidate shall be required to have passed the Part I examination before he/she can appear for the Part II examination.The student shall be required to clear the Degree Course within five years from the date of admission to the Degree Course during which he/she shall be eligible to re-appear in the failed subjects as many times as will be allowed by the limitation of years beyond which the candidate shall be required to seek re-admission to the first year as a fresh candidate.	No change

...3...

Existing Ordinances	Proposed amendments/addendum
Course Structure 6.(a)Bachelor of Arts(General): The course structure and the distribution of marks for B.A.General shall be as under:	No change

Subject	1st year	2nd year	3rd year
English	100	100	-
G.F.C.	-	-	100
M.I.L.	-	100	100
Elective - I	100	100	100
Elective - II	100	100	100
Elective- III	100	100	100
Total:	400	500	500

Grand Total:1400 Marks

(b) Bachelor of Science and Bachelor of Home Science General:
The course structure and distribution of marks for B.Sc and Home Science Courses General shall be as under:- — No change

Subject	1st year	2nd year	3rd year
English	100	-	-
G.F.C.	-	-	100
Elective - I	100	200	100
Elective - II	100	200	100
Elective - III	100	200	100
Total:	400	600	400

Grand Total:1400 Marks

(c) Bachelor of Commerce General: — No change
The course structure and the distribution of marks for B.Com Courses General shall be as under:-

Subject	1st year	2nd year	3rd year
English	100	100	-
G.F.C.	-	-	100
M.I.L.	-	100	100
Elective - I	100	100	100
Elective - II	100	100	100
Elective - III	100	100	100
Total:	400	500	500

Grand Total:1400 Marks

(d) Bachelor of Arts with Honours: — No change
The course structure and the distribution of marks for the B.A.course with Honours shall be as under:-

Subject	1st year	2nd year	3rd year
English	100	100	-
G.F.C.	-	-	100
M.I.D.	-	100	-
Elective - I	100	100	100
Elective - II	100	100	100
Major(Elective)	200	300	300
Total:	500	700	600

Grand Total:1800 Marks

...4...

ANNEXURE - II

Existing Ordinances	Proposed amendments/addendum
(e) Bachelor of Science and Bachelor of Home Science with Honours :	No change
The course structure and distribution of marks for the B.Sc with Honours and B.Sc(Home Science) with Honours shall be as under:-	
Subject — 1st year — 2nd year — 3rd year	
English 100 — —	
G.F.C. — — 100	
M.I.L. — — —	
Elective-I 100 200 100	
Elective-II 100 200 100	
Major(Elective) 200 300 300	
Total : 500 700 600	
Grand Total : 1800 Marks	
(f) Bachelor of Commerce with Honours :	No change
The course structure and the distribution of marks for the B.Com course with Honours shall be as under :-	
Subject — 1st year — 2nd year — 3rd year	
English 100 100 —	
G.F.C. — — 100	
M.I.L. — 100 —	
Elective-I 100 100 100	
Elective-II 100 100 100	
Major(Elective) 200 300 300	
Total : 500 700 600	
Grand Total: 1800 Marks	
Common Courses 7. There papers of each elective subject, General Foundation Course and MIL shall be common to both categories of candidates, with or without honours. the three common papers of the elective subject shall be spread over the three years, i.e. one paper in each year except for the candidates being admitted with effect from the 1997 academic session.	No change
Miscelleneous 8. (i) This Ordinance shall be effective from the academic session beginning fro from 1993 except where indicated.	No change
(ii) The Organisation of the Programmes leading to the Degrees in this Ordinance, framing of the course and conduct of examinations and other related matters shall be laid down in the regulations framed for this purpose from time to time.	No change
(iii) The students who have been studying for the two years Degree pass course or three years Degree Honours Course immediately before the Commencement of this Ordinance shall be governed by the provision of the Ordinance in force at the time of their enrolment.	No change

Contd..../-

ANNEXURE- II

Existing Ordinances	Proposed ammendments/addendum
(iv) Notwithstanding anything contained in this Ordinance, the Academic Council shall take any such decision as may be deemed necessary for overcoming any difficulties that may arise during the transitional period.	No change
(v) A student from the Arts group may be permitted to opt for only one elective having 400 marks and such candidates shall have only none MIL paper of 100 marks.	No change
(vi) The MIL paper in the third year shall be common to both the categories of candidates with or without major/honours. This paper may comprise of prose, poetry, drama etc.	No change
(vii) A student from Science stream opting Economics as one of the electives shall have 4 papers in Economics, the 4th paper being from the major/honours group which is not common paper.	No change
(viii) A student choosing English as major elective shall be required to opt for one elective in lieu of general English of 200 marks and one MIL of 100 marks.	No change
(ix) A student going for major/honours may opt to switch over to a course without major but not vice-versa. However, with effect from the 1997 academic session such switch over shall not be allowed beyond the Part I examination.	No change Another Clause(say Clause 9)be added to OC-8 as follows:- Professional Courses 9: For each Professional Course introduced, there shall be a "REGULATION" detailing the Course of study, eligibility, duration and structure, division and classes, award of Degrees, course structure, common courses, etc".

ANNEXURE-III

Existing Ordinances	Proposed ammendments/ addendum
OA-13 Title - "ON BOARD OF STUDIES FOR PROFESSIONAL COURSES"	Title to be changed/ corrected as:- "ON THE BOARD OF POST-GRADUATE STUDIES FOR PROFESSIONAL COURSES"

(iv) -- Second Conference of the Vice-Chancellór of Central Universities held on May 25-26,2001 at IGNOU Campus,New Delhi.

The Recommendation of the Second Conference of the Vice-Chancellors of Central Universities held on May 25-26, 2001 at IGNOU Campus,New Delhi, as received from the Ministry of Human Resource Development is placed at Annexure 'A' for perusal & consideration of the council. The Ceans Committee in its meeting held on 13.12.2002 endorse the recommendations for consideration of the Academic Council.

The Deputy Secretary,MHRD stressed on submission of an Action Taken Report . An Action Taken Report /interim reply sent to MHRD is placed at Annexure 'B'

The University could not give any ATR or reply on some points of the Recommendations which relates to policy matters i.e.On Amentment of Act,Statutes on decentralization of decision -making responsibilities and on review of financial management.

The matter is placed before the Academic Council for consideration & decisions on the Recommendations of the Vice-Chancellors' Conference or any of the points therein.

5:1:4(2) ANNEXURE-'A'

Ministry of Human Resource Devel.
Deptt. of Secondary Education & Higher Education
Government of India
SHASTRI BHAVAN
NEW DELHI - 110 001.

R,D. SAHAY
DEPUTY SECRETARY

D.O.NO.F.20-1/2002-DESK(U)(A) the 18th December,02

Dear Sir,

Kindly refer to the correspondence resting with various communications sent by us seeking the Action Taken Report on the recommendations of the Second Conference of the Vice-Chancellors of the Central Universities held on May 25-26,2001 at IGNOU Campus,New Delhi.

I regret to say that despite several reminders, the Action Taken Report is awaited from your organisation A statement indicating the gist of recommendations of the Conference and the name of the Institutions/Universities, from which the Action Taken Report is awaited is enclosed.

According to the Resolution No,23 adopted at the said Conference, the next Conference of the Vice-Chancellors of the Central Universities was to be held in November, 2001 at Pondicherry. However, the same could not be held for want of Action Taken Report on the recommendations of the Second Conference of the Vice-Chancellors of the Central Universities.

May I request you again,Sir, to kindly look into this matter personally and direct the concerned officers of the University/organisation to expedite the requisite report to this Ministry so that the next Conference of the Vice-Chancellors of the Central Universities could be organised at the earliest.

With regards,

Yours sincerely,
Sd/-
(R.D. Sahey)

Prof. Mrimal Miri
Vice-Chancellor
North Eastern Hill University
Shillong 793 022.

SECOND CONFERENCE OF VICE-CHANCELLORS OF CENTRAL UNIVERSITIES HELD ON MAY 25-26,2001 AT IGNOU CAMPUS, NEW DELHI = ACTION TAKEN REPORT

S.No.	Gist of Recommendations	Remarks
1.	All CUs to prepare ''Vision 2025'' Document on priority.Copies to be sent to MHRD and NIEPA,NIEPA to give its comments and bring out a compendium on Vision Documents of all CUs	Information is awaited from the University of Delhi,JNU,Univ. of Hyderabad,AMU,Visva Bharti, NEHU,Assam Univ.,Nagaland Univ., MANU,MGAHV,BHU and NIEPA.
2.	NIEPA to bring out good practices series in the area of Higher Education on quarterly basis.	-do-
3.	NIEPA to bring out compilation of CUs Legislations	Information is awaited from NIEPA
4.	AIU to bring out compilation of Court judgements in Higher Education	Information is awaited from AIU
5.	Each CU to review its Act and Statutes	Information from Univ. of Delhi, JNU,Hyderabad Univ.,AMU,Visva Bharti, NEHU,Assam Univ.,Nagaland Univ.,MANU, BHU and MGAHV is awaited
6.	Each CU to strengthen its mal-practices Cell	-do-
7.	NIEPA to conduct cross-country study on financing of Higher Education	Information from NIEPA is awaited.
8.	Pending amendment in Acts and Statutes, all CUs may consider decentalization of decision making setting up of Standing Committees to look after the delegated responsibilities of the Academic Council,devising appropriate mechanism for finalisation and appvl. of the minutes of the meeting creating mechanism for greater use of IT and implementation of Management Information System	Information is awaited from Univ. of Delhi,JNU,Hyderabad Univ.,AMU, Visva Bharti,NEHU,Assam Univ., Nagaland Univ.,MANU,BHU and MGAHV.

Contd/-

9.	CUsto consider suitable adoption /adaption of the innovative practices being followed in BITS ,Pilani towards better financial management and improved student satisfaction levels	- do -
10.	All CUs to take concrete steps for reducing the teaching to non-teaching staff ratio	- do -
11.	NIEPA to work out details of the Block Grant Schemes for the Universities	Information is awaited from NIEPA
12.	All CUs to adopt proactive approach for operationalisation of INTRANET,Internet and Library Networks	Information from Univ. of Delhi JNU,Hyderabad Univ., AMU,Visva Bharati,NEHU,Assam Univ.,Nagaland MANU,BHU and MGAHV is awaited.
13.	Areas of collaboration between Open Universities and Conventional Universities	- do -
14.	All CUs which are still not assessed and accredited by NAAC, to initiate action in the matter	- do -
15.	The benefit under CAS to teachers to given from the date of eligibility of the teacher concerned or w.e.f. 27.7.98,whichever is later	- do -

5:1:4(5)

ANNEXURE- 'B'

NORTH-EASTERN HILL UNIVERSITY
NEHU Campus, Shillong- 793022

No.G.40-5/Acad./ACU/2001-03-2601 Dated:February 10 2003.

To,

R.D. Sahay,
Deputy Secretary,
Ministry of Human Resource Development,
Department of Secondary Education & Higher Education
Govt. of India,
Shastri Bhavan,
New Delhi - 110 001.

Sub: Second Conference of the Vice-Chancellor of the Central University's Held on May 25-26,2001 at IGNOU, New Delhi.

Ref: Your letter No.F.20-1/2002-Desk(U)(A), dated 18.12.2002.

Sir,

With reference to the above, I am directed to furnish below the report:

Item 6: Strengthening the mal practice Cell:

The University has the mal practice Cell under the Examinations Department thcugh mal practices in the University Examinations are very rare. The University also has a Grievance Cell.

Item 9: Adoption of Innovative Practices followed in BITS,Pilani:

BITS Pilani being contacted for more details/Advice.

Item 19.Reducing Teaching to Non-teaching:

Already taken as per U.G.C. guidelines for ration of 1:3 Academic to Non-Academic in NEHU it is now 1:3.1.

Item 11:Block Grant Schemes:

Have sent several reminders to MHRD regarding their proposed and apparently approved infrastructural support to NEHU amounting Rs. 8.31 crores.Reply is yet to be received though correspondence by letter, e-mail,phone and personal meeting made by the Registrar with Deputy Secretary, MHRD (Hon'ble) Mr.R.D. Sahay).

Item 13:Areas of collaboration between Open University & Conventional University's :

Collaboration exists between NEHU and IGNOU. Computer classes is conducted in NEHU for students of IGNOU.

Item 14:NAAC Accreditation;

Already accredited by NAAC.

Item 15:Effective date of benefit of CAS:

The benefit of CAS is given w.e.f. date of the teacher's eligibility or 27.7.98,whichever is later.

Contd/-

I am also to inform you that the action taken report on the same subject had been sent to Ravi Chand,Under Secretary, MHRD, Department of Secondary & Higher Education vide this University's letter No.F.2-5/Acad./REFORMS/2002-2373, dated 11.10.2002 pursuant to his letter No.F. 20-1/2001-Desk(U)(A),dated 19.7.02.

Yours faithfully,

Sd/-

Deputy Registrar
(Academic)

(v) Ordinance on Career Advancement Scheme for the University teachers.

In terms of Clause (5) & (6) of the Statute 41, the amended Ordinance OE-16 on CAS was notified. Meanwhile, the Ministry had intimated that the amended Ordinance was not in consonence with the guide-lines provided by the U.G.C, vide letter at Annexure 'A'

The matter is placed before the Council for consideration.

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5:1:5(2)

Annexure-'A'

No.F.8-22/2002-Desk(U)
Government of India
Ministry of Human Resource Development
Department of Secondary and Higher Education
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New Delhi, the 10th April,2003

To

The Vice-Chancellor,
North-Eastern Hill University,
Shillong.

Subject: Amendment of Ordinance OE-16 on Career Advancement Scheme of the Teachers of NEHU.

Sir,

I am directed to refer to your office communication No:Conf/13-5/Ord/99(Vol-II)-3 dated 3rd April, 2003 on the above mentioned subject and to say that the proposed amendment to the Ordinance is presently under examination in the Ministry in consultation with the University Grants Commission. It is stated that the University Grant Commission has already issued clarification to all Universities relating to promotion from Reader to the Post of Professor under Career Advancement Scheme vide its letter dated 5th Oct.,2000. It may be noted that the Commission clarified that 8 years service as Reader must remain the minimum eligibility for consideration of promotion from Reader to the post of Professor under Career Advancement Scheme. A copy of the communication since issued by the UGC referred to above is enclosed.

2. In view of above, it is requested that no further action may be taken by the University, pursuant to the Notification dated 4th March, 2003, till a decision is taken, in consultation with UGC, by the competent authority.

Yours faithfully

Sd/-

(P.S.Chakraborty)
Under Secretary to the Govt.of India
Tel No.2338 1662

Encl: As above

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5: – Academic Matters

(vi) Guidelines for counting of past service for promotion from Reader to Professor under Career Advancement Scheme.

The Joint Secretary, U.G.C vide letters No.F.2-5/2000(PS) dated 13.3.03 and No.F.2-5/2000(PS) dated 28.5.03 are placed as Annexure 'A' and 'B' respectively wherein the Commission considered the guidelines for counting of past service for promotion for Reader to Professor. However, the Commission decided to consider only those who had rendered their services in the same scale of pay (Rs.3700-5700)(Pre-revised) (Rs.12,000-18,300/-(Revised) in the Govt. of India/State Govt./Autonomous Bodies of Govt. of India or State Govt. Laboratories of which who had possessed qualification equivalent to that of Reader while working in the aforesaid Institutions/Establishments under Career Advancement Scheme.

The matter is placed before the Council for consideration.

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5:1:5(2) ANNEXURE -'A'

UNIVERSITY GRANTS COMMISSION
BAHADUR SHAH ZAFAR MARG
NEW DELHI-110002

F.2-5/2000(PS) 13th March, 2003

The Registrar
(All Universities)
(As per list attached)

Sub: Guidelines for counting of past service for promotion from Reader to Professor under Career Advancement Scheme.

Sir/Madam,

The Commission in its meeting held on 23.1.2003, considered the guidelines for counting of post service for promotion from Reader to Professor and decided that past services rendered as Reader/Associate Professor(in the scale of pay of Rs.3700-5700 or revised Rs.12,000-18,300) in any other recognized University/College be counted for promotion to the post of Professor under Carcer Advancement Scheme.

This is for information & necessary action.

Yours faithfully

Sd/-
(Dr.(Mrs) Pankaj Mittal)
Joint Secretary

Copy to :-

Sh. A.K.Khanna
Under secretary
Government of India
Ministry of Human Resource Development
Department of Secondary and Higher Education
Shastri Bhawan
New Delhi - 110 001.

Sd/-
(Sushma Nayyar)
Section Officer

******** ******** ********

5:1:6(3) ANNEXURE- 'B'

UNIVERSITY GRANTS COMMISSION
BAHADUR SHAH ZAFAR MARG
NEW DELHI - 110002

F.2-5/2000(PS) 28th May, 2003

The Registrar
North Eastern Hill University
P.O NEHU, Campus, Mawkynroh,
Umshing,
Shillong -793 022

******* ******* *******

Sub: Guidelines for counting of past service for promotion from reader to Professor under Career Advancement Scheme.

Sir/Madam,

In continuation to this office circular of even number dated 13.3.2003 (copy enclosed for ready reference) on the subject cited above, I am directed to inform you that the Commission in it's meeting held on 9.4.2003 considered the guidelines for counting of past service for promotion from Reader to Professor and decided that past service of a Reader be considered for promotion to the post of Professor only if he or she had rendered his or her services in the same scale of pay (Rs.3700-5700(pre-revised)Rs.12,000-18,300(revised) in the Government of India/State Government/ Autonomous Bodies of Government of India or State Government Laboratories and if he or she had possessed qualifications equivalent to that of Reader while working in the aforesaid institutions/establishments.

Yours faithfully

Sd/-

(Dr.(Mrs)Pankaj Mittal)
Joint Secretary

****** ****** ******

5:2 - SYLLABUS

ii) Revised Syllabus for B.Sc. in computer Science.

The Board of Under-Graduate Studies in Computer Science in its meeting held on 19th May, 2003 considered and approved the Revised Syllabus for B.Sc in Computer Science which is placed as Annexure 'B'

The matter is placed before the Council for consideration.

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5:2:2(2)

Annexure – 'A'

SYLLABUS FOR

BACHELOR OF SCIENCE (COMPUTER SCIENCE)

NORTH EASTERN HILL UNIVERSITY
SHILLONG

5:2:2(3)

Contents

Preamble

Overview

The Three Year B.Sc. Course in Computer Science, for both Pass and Honours students, builds on the recently revised course of Computer Science for classes VIII to XII. However, it is also a fact that many students have not had the opportunity to take up this subject at the pre-degree or they have studied it only in the non-formal sector. Hence, provision has been made for such situations by offering an elective in Paper I, which covers a syllabus similar to that of Class XII. For the long term it is envisaged that only students who have completed a course in computer science at the Higher Secondary stage would be permitted to take up this course at the Degree level.

Eligibility

Students who have sastisfied the University norms if they had taken up Computer Science in Class XII, or who have have knowledge of Programming in C and had Mathematics in Class XII.

Practical Record Book

In the papers involving practicals, a standard set of problems have been listed. These and/or others similar to them are to be done as practical work and submitted by the student in a laboratory record book. For each problem, the following sections are to be recorded :

1. definition of the problem
2. glossary of variables
3. pseudocode and/or flowchart
4. sample test data
5. source code
6. sample input/output screens.

Internal Assessment

The marks for internal assessment specified for each paper is to be given on the basis of

1. tests held during the year (for both theory and practical)
2. assignments submitted and/or seminars given
3. laboratory record book in the papers applicable.

A Record of this may be maintained in the college.

Practical Examination

For the examination in practicals, the problems need not be restricted to those given in the syllabus. However, they should be of similar standard. For evaluation of practical examination, the following points may be considered

10% : Syntax and Input/Output screens
30% : Logic and efficiency (source code, pseudocode, algorithm)
20% : Error trapping (illegal or invalid input, stack overflow, underflow, insufficient physical memory etc.)
20% : Completion
20% : Result

COURSE OUTLINE (GENERAL & HONOURS)

Year	Stream	Paper	Name	Minimum Class Hours			Exam Time (Hours)		Marks			
				Theory	Practical	Total	Theory	Practical	Theory	Practical	Internal	Total
I	General	I	Elective 1 : Programming & Problem Solving Using C Elective 2 : Data Structures Using C	60	60	120	2	3	50	40	10	100
	Honours	VI	Database Management System	85	25	120	3	-	90	-	10	100
II	General	II	Elective 1: Visual Programming Using VB Elective 2: Visual Programming Using VB.NET Elective 3: Computer Oriented Numerical Methods	60	60	120	2	3	50	40	10	100
	General	III	Computer Organisation	120	-	120	3	-	90	-	10	100
	Honours	VII	Data Communication and Networks	120	-	120	3	-	90	-	10	100
III	General	IV	Software Engineering	60	-	60	2	-	40	-	10	50
	General	V	Project	-	100	100	-	-	-	40	10	50
	Honours		Project	-	150	150	-	-	-	50	20	70
	Honours	VIII	Elective 1. Object Oriented Programming through C++ Elective 2: Object Oriented Programming through Java	60	60	120	2	3	50	40	10	100
	Honours	IX	Operating System and Introduction to Unix	120	-	120	3	-	70	-	10	80

Tutorial

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COURSE OUTLINE FOR GENERAL STUDENTS

Year	Stream	Paper	Name	Minimum Class Hours			Exam Time (Hours)		Marks			
				Theory	Practical	Total	Theory	Practical	Theory	Practical	Internal	Total
I	General	I	Elective 1 : Programming & Problem Solving Using C Elective 2 : Data Structures Using C	60	60	120	2	3	50	40	10	100
II	General	II	Elective 1. Visual Programming Using VB Elective 2. Visual Programming Using VB.NET Elective 3. Computer Oriented Numerical Methods	60	60	120	2	3	50	40	10	100
	General	III	Computer Organisation	120	-	120	3	-	90	-	10	100
III	General	IV	Software Engineering	60	-	60	2	-	40	-	10	50
	General	V	Project	-	100	100	-	-	-	40	10	50
TOTAL MARKS									230	120	50	400

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COURSE OUTLINE FOR HONOURS STUDENTS

Year	Paper	Name	Minimum Class Hours			Exam Time (Hours)		Marks			
			Theory	Practical	Total	Theory	Practical	Theory	Practical	Internal	Total
I	I	**Elective 1** : Programming & Problem Solving Using C **Elective 2** : Data Structures Using C	60	60	120	2	3	50	40	10	100
	VI	Database Management System	85	25 Tutorial	120	3	-	90	-	10	100
II	II	**Elective 1**: Visual Programming Using VB **Elective 2**: Visual Programming Using VB.NET **Elective 3**: Computer Oriented Numerical Methods	60	60	120	2	3	50	40	10	100
	III	Computer Organisation	120	-	120	3	-	90	-	10	100
	VII	Data Communication and Networks	120	-	120	3	-	90	-	10	100
III	IV	Software Engineering	60	-	60	2	-	40	-	10	50
	V	Project	-	180	180	-	-	-	50	20	70
	VIII	**Elective 1**: Object Oriented Programming through C++ **Elective 2**: Object Oriented Programming through Java	60	60	120	2	3	50	40	10	100
	IX	Operating System and Introduction to Linux	120	-	120	3	-	70	-	10	80
TOTAL MARKS								530	170	100	800

Paper I (Elective 1): Programming & Problem Solving through C

Objective

The objective of the course is to introduce the fundamentals of C programming language and develop the skills for solving problems using computers. After completion of this course, a student will be able to

- understand and use the process of abstraction using a programming language such as 'C'
- analyse step by step and develop a program to solve real world problems
- use some of the simple data structures viz. Stacks, queues, linked list and trees
- understand the basics of system programming, graphics programming and design user interface

Outline of the Course

Minimum Class Hours			Exam time (Hours)		Marks			
Theory	Practical	Total	Theory	Practical	Theory	Practical	Internal	Total
60	60	120	2	3	50	40	10	100

Unit	Topic	Minimum Class Hours			Marks (Theory)
		Theory	Practical	Total	
I	C fundamentals, I/O functions, Control statements, The C preprocessor	8	7	15	8
II	Functions, arrays and pointer	13	12	25	10
III	Structure and Union, Data files	12	13	25	10
IV	Simple data structures, VDU Basics, Keyboard Basics	15	15	30	12
V	Graphics and mouse programming	12	13	25	10
Total		80	80	120	50

Detailed Syllabus

Unit I: C fundamentals, I/O functions, Control statements, The C preprocessor **8+7 Hours**

C Fundamentals: The C character set, identifiers and keywords, Data types, constants, variables and arrays, declarations, symbolic constants, Operators (Arithmetic, unary, relational, logical, bitwise, assignment), expressions, statements, C program structure, Need of header files, Process of compiling and running a C program

I/O functions: Header files (stdio.h, conio.h) getch(), getche(), getchar(), putch(), putchar(), scanf(), printf(), gets(), puts(), clrscr(), window()

Control statements: Decision making and branching (**if..else, switch**), Decision making and looping (**while, do .. while, for**), Jumping (**break, continue, goto**), Nested loops

The C Preprocessor: Macro Expansions, Macro with arguments and Macro versus function, File Inclusion, Conditional Compilation, #if and #elif directives, Miscellaneous directives (#define and #undef)

Unit II: Functions, Arrays and Pointer **13+12 Hours**

Functions: Overview (definition, declaration), defining a function, accessing a function, function prototypes, call by value, call by reference, recursion, iteration, Advantages and disadvantages of recursion over iteration, Storage classes (Automatic, Register, External, Static), String functions (strcmp (), strlen (), strrev (), strcat (), toupper (), tolower ()), Math functions (sqrt (), abs (), sin (), cos () Standard function- exit (), Memory allocation functions (malloc (), free (), realloc(), calloc())

Arrays and Pointers: Defining an array, array initialization, processing an array, passing array to a function, multidimensional arrays, arrays and strings, pointer declarations, passing pointer to a function, pointer and one dimensional arrays, Operation on pointers, pointers and multidimensional arrays, arrays of pointers, passing functions to other functions, pointer to function, functions returning pointers.

Unit III: Structure and Union, Data files **12+13 Hours**

Structures and Unions: Defining a structure, processing a structure, user defined data types, structures and arrays, structures and pointers, passing structures to a function, self referential structures, bit fields in structures, Union, Union of structures, Enumerated, typedef

Data files: File opening modes, character I/O(getc(), putc()), String I/O (fgets(), fputs()), Formatted console I/O(fscanf(), fprintf()), text mode versus binary mode, Unformatted console I/O functions - record I/O(fread(), fwrite(), fseek(), rewind(), rename()), Record operations (append, delete, update, search, display, sorting of records) checking file opening error, closing data files, Command line parameters, low level disk I/O (setting buffer, read buffer, file opening modes).

Unit IV: Simple data structures, VDU Basics, Keyboard Basics **15+15 Hours**

Section (a): *Simple Data structures:* Stack(push, pop, isempty, pop and display, display top operations), Queue using array (insert, delete, isempty , isfull operations), Creation of linked list, insertion, deletion, searching, of nodes for linked lists(singly, doubly Circular), Balanced Binary tree (creation, recursive tree traversals – inorder, preorder postorder)

Section (b): *VDU Basics:* Screen memory accessing, memory segments, far pointers, writing to VDU memory, text mode, color attribute, Interrupts, interrupt vector table, WORD register, BYTE register, DOS interrupts, BIOS interrupts, int86() functions(controlling cursor size, position of cursor, visibility) and int86x() functions(make, remove, change directory and delete file)

Keyboard Basics: Operation on keyboard, Shift and Toggle keys

Unit V: Graphics and Mouse Programming **12+13 Hours**

Graphics Programming: Introduction, Input devices (keyboard and mouse), Graphic output devices (VDU, LCD), plotter, printer, Video Graphics Adapter (VGA, CGA, SVGA), VRAM, Resolution, Library file- graphics.h, 2-D Coordinate system, Simple Graphics Functions(initgraph(), line(), circle(), arc(), rectangle(), ellipse(), drawpoly(), closegraph(), restorecrtmode(), setfillstyle(), putpixel(), getmaxx(), getmaxy(), outtextxy(), setcolor(), fillcolor(), settextstyle(), moveto(), lineto(), moverel(), linerel()) Pallete and color. Animation functions(imagesize(),getimage(),putimage() and arguments)

Breshenham's Line drawing algorithms, Brehsenham's Circle generation. Introduction to Curves (B-Spline and Bezier)

Mouse Programming: GUI and mouse, dos.h, mouse initialization, show and hide mouse pointer, restricts mouse movement, Cursor Position and button status, menus using mouse.

Practical Assignments

(Questions need not be restricted to this list)

1. Write a program to display the message "Welcome to the C programming world" on the screen.
2. Write a program to find out the sum of two integer values and display the result on the screen. Input the two values from the keyboard.
3. Write a program to find out the greatest of three numbers.
4. Write a program for swapping the two numbers with / without using another variable.
5. Write a program to find whether the given year is a leap year or not (use % modulus operator)
6. Write a program to find out the real roots of quadratic equation, $Ax^2+Bx+C=0$.
7. Write a program to convert the given temperature in Fahrenheit to Celsius using the following conversion formula, C=(F-32)/1.8.
8. Write a program to find out the average of any ten numbers. (Use (a) while loop, and (b) for loop).
9. Write a program to generate Fibonacci sequence. (1,1,2,3,5,8,13, ...)
10. An employee is paid 1.5 times the normal rate for every hour beyond 40 hours worked in a week. Write a program to calculate the weekly wage of an employee.
11. Write a program to check whether the given string is palindrome or not.
12. The total distance traveled by a vehicle in t seconds is given by

Distance = ut + (at^2)/2

Where u is the initial velocity (meters per second), a is the accelaration (meters per second2). Write a program to evaluate the distance traveled at regular intervals of time, given the values of u and a. The program should provide the flexibility to the user to select his own time intervals and repeat the calculations for different values of u and a.

13. For a certain electrical circuit with an inductance L and resistance R, the damped natural frequency is given by

Frequency = $\sqrt{(1/LC-R^2/4C^2)}$

It is desired to study the variation of this frequency with C (capacitance). Write a program to calculate the frequency for different value of C starting from 0.1 in steps of 0.01.

14. Write a program to read the following numbers round them off to the nearest integers and print out the results in integer form:

7.7 50.21 -23.73 -46.45

15. Given the string "WORDPROCESSING", write a program to read the string from the terminal and display the same in the following formats:

(a) WORD PROCESSING (b) WORD PROCESSING (c) W. P.

16. Admission to a professional course is subject to the following conditions:

(a) Marks in mathematics >=60
(b) Marks in physics >=50
(c) Marks in chemistry >=40
(d) Total in all three subjects >=200

Or

Total in mathematics and physics >=150

Write a program to search of admission of students. The user has to enter the marks from the keyboard of the corresponding subjects.

17. Write a program that will read the value of x and evaluate the following function

Y= 1 for x>0
0 for x=0
-1 for x<0

Using

(a) nested if statements,
(b) else if statements, and
(c) conditional operator?

18. Write a program to calculate the monthly telephone bill according to the following rules:

(a) Rural subscribers:

Upto 250 calls	Free
251 calls to 450 calls	0.60
451 calls to 500 calls	0.80
501 calls to 1000 calls	1.00
above 1000 calls	1.20

(b) Urban subscribers:

Upto 150 calls	Free
151 calls to 400 calls	0.80
401 calls to 1000 calls	1.00
above 1000 calls	1.20

(c) The rental for urban subscribers depends on the number of calls upto 400 calls the rental will be 200/- and above 400 calls the rental will be 240/- For rural subscribers the rental is always 200/-

19. Write a C program to input the Name, City Type (whether Metro or Non-Metro) and Basic Pay of an employee and calculate the salary according to the following rules:

    (a) Dearness allowance (DA)
        (i) Upto Rs. 3500 110% of basic pay
        (ii) Above Rs.3500 90% of the basic pay subject to a maximum of Rs. 3850 (i.e. DA should be at least Rs. 3850.
    (b) House Rent Allowance (HRA) is 15% of the basic pay subject to a maximum of Rs. 800 (i.e. never more than Rs. 800)
    (c) If City is Metro, City Compensatory Allowance (CCA)=800 else if it is Non-Metro, CCA=600.
    (d) Provident Fund (PF) is 12% of the basic pay.
    (**Total Salary**=Basic Pay +DA+HRA+CCA-PF)

    The **output** should be in the following format (Example only)

Example Name	ABCDEF
Basic Salary	5000
Dearness Allowance	4500
HRA	750
CCA: Non-Metro	600
PF	500
Total Salary	10250

20. Write a program to sum the following series:
    a) The first n natural numbers
    b) The first n odd natural numbers
    c) The first n even natural numbers
21. Write a program to sum the series : 2 * 3 – 3 * 5 + 4 * 7 + to n terms
22. Given a number, write a program using while loop to reverse the digits of the number. For example, the number 12345 should be written as 54321 (**Hint:** Use modulus operator to extract the last digit and the integer division by 10 to get the n-1 digit number from the n digit number.)
23. Write a program for sorting the elements of an array by using Selection sort, Bubble sort, Insertion sort.
24. Write a program to generate positive prime numbers.
25. Write a program to display the multiplication table of a given number from 1 to 20.
26. Write a program to display the multiplication table of a given number for a given range.
27. Write a program to display the multiplication table of a given group of numbers (maximum five numbers) for a given range.
21. Write a program to find the biggest and smallest number and its position in the given array.
22. Write a program to find addition, subtraction and multiplication of matrices using function.
23. The factorial of an integer m is the product of consecutive integers from 1 to m. That is,

    Factorial m = m! =m*(m-1)*(m-2)*...*1.

24. Write a program to find the sum of row, column, and diagonals of the given matrix.
25. Write a program to find the largest number of the given matrix using function.
26. Write a program to sort all the elements of a matrix using function
27. Write a program to input a string and perform the following tasks without using library functions: (a) to find its length, (b) to change it to upper case / lower case (c) to extract the left most n characters, (d) to extract the right most n characters (e) to extract n characters from it staring from position p, (f) to insert another string in it at position p (g) to replace n characters in it starting at position p with a given string
28. Write a program to search a pattern in a given text.
29. Write a program to search a pattern in a given text and replace very occurrence of it with another given

string.

30. Write a program to write a given number in words using function.

31. Write a program to display the text in a FILE. (TYPE command in DOS).

32. Write a program to copy the contents of one text to another text file using command line arguments.

33. Write a program to merge the two text file to another text file.

34. Write a program to copy the contents of one text file to any number of given files using command line arguments.

35. Write a program to count the number of characters, lines and words in a text file.

36. Write a program to print every line of a text file containing a given pattern.

37. To copy a file by converting lower case text file to upper case text file using command line argument.

38. Write a program to input, sort, and display n names using using array of pointers.

39. Write a program to count the number of vowels, consonants, and other characters and the number of words in a string / file. A space, tab, or a punctuation mark separates a word (. ; : !).

40. Write a menu driven program to create records of students with marks in various subjects and store them in a file (sequential, random or binary). Make provision for viewing all the records, searching a particular record, editing a particular record, deleting a particular record and listing a particular group of records.

41. Write a program to find the memory (RAM) size using call to ROM-BIOS function.

42. Write a function **cls( )** which would wipe the contents of the screen and place the cursor on top left corner of the screen when called.

43. Display a menu on the screen containing 4 items (File, Edit, View, Setting). Highlight the first item of the menu, and as the Up and Down arrow keys are hit the highlighted bar should move from one menu item to another. User must be able to select a menu item by hitting the Enter key, when the highlighted bar is placed on that item.

44. Write a general purpose function **goto_rc( )** to place the cursor at any given position on the screen. Test this by displaying the message "Rat a tat a tat" at 10th row, 20th column on the screen.

45. Write a general purpose function **size( )** which when called would change the size of the cursor in text mode. The function should be intelligent enough to hide the cursor when called upon to do so.

46. Write a general purpose function **writestring( )** which will display a message on the screen by writing it directly into VDU memory. The function should be capable of displaying the message in the attribute that is sent to it.

47. Write a program which continuously keeps changing the capital letters present on the screen into small case letters and small case letters present on the screen into capitals. You are not allowed to use printf(), putchar(), puts() or putch().

48. Design a graphics program to draw a circle, a square and an isosceles triangle. The triangle should be inside the square and the square must be inside the circle. The program should allow

    (a) to zoom a single figure (50%, 200%)

    (b) to zoom all figures at a time(50%, 200%)

49. Draw two lines crossing all the figures diagonally across the screen. Do the clipping operation with (reference to the diagram drawn using problem 48) of the lines. After the operation, the segment of the line outside the figure will disappear.

50. Write a program to design a circular shaped mouse cursor

Instructions For paper setter

(The question papers will be set according to the following scheme)

Unit	Theory Questions		Practical Questions		
	To be set	To be answered	To be set	To be answered	Marks
I	2	1	2	1	8
II	2	1			
III	2	1	3	2	10
IV	4 (2 from each section)	1 from each section	3	2	12
V	2	1	2	1	10

Distribution of marks for practical

10% : Syntax and Input/Output screens
30% : Logic and efficiency (source code, pseudocode, algorithm)
20% : Error trapping (Illegal or invalid input, stack overflow, underflow, insufficient physical memory, etc)
20% : Completion
20% : Result

Recommended Books

Text

1. **Yashavant Kanetkar**, *Let us C*, (Fourth Edition), BPB Publications, 2003

References

1. **Byron S. Gottfried**, *Theory and Problems of Programming with C*, (Second Edition), Tata McGraw Hill Publication, 1998
2. **Hearn & Baker**, *Computer Graphics*, (Second Edition), Prentice Hall India, Ltd., 2000
3. **E. Balaguruswamy**, *Programming in ANSI C*, (Second Edition), Tata McGraw Hill publication, 1998
4. **William M. Newman, Robert F. Sproull**, *Principles of Interactive Computer Graphics*, (Second Edition), Tata McGraw Hill Publishing Co Ltd., 1997
5. **Y. Langsam, M.J. Augenstein, A.M. Tenenbaum**, *Data structure using C and C++*, Second Edition, Prentice Hall India Ltd., 2002

Paper I (Elective 2): Data Structures Using C

Objectives

The objective of the course is to learn how to create data structures in a computer language, such as C, to represent a collection of similar data, and how to process these data most efficiently for solving problems. After completion of this course, a student will be able to

- understand and use the process of abstraction using a programming language such as 'C'
- analyse step by step and develop algorithms to solve real world problems
- implement various data structures viz. Stacks, Queues, Linked Lists, Trees and Graphs
- understand various searching and sorting techniques and their processing efficiency.

It is expected that the student has adequate knowledge of C language basics, functions, arrays, structures, pointers and dynamic memory allocation.

Outline of the Course

Minimum Class Hours			Exam Time (Hours)		Marks			
Theory	Practical	Total	Theory	Practical	Theory	Practical	Internal	Total
60	60	120	2	3	50	40	10	100

Unit	Topic	Minimum Class Hours			Marks
		Theory	Practical	Total	(Theory)
I	Data Representation and Algorithm Design; Arrays	10	10	20	10
II	Linked Lists, Stacks and Queues	16	18	34	15
III	Trees and Graphs	18	18	36	15
IV	Searching and Sorting and their complexity analysis	15	15	30	10
	TOTAL	60	60	120	50

Detailed Syllabus

Unit I : Data Representation and Algorithm Design; Arrays **10 Hours + 10 Hours**

Data Type, Abstract Data Type, Data Structure, Fundamental and Derived Data Types

Design and analysis of algorithm, Algorithm definition, Structured Programming, Top down and Bottom up approaches, Comparison of algorithms, Frequency count, Complexity measures in terms of time and space; Big O notation

Recursion (Towers of Hanoi, Fibonacci Numbers, Binary search), Comparison of Recursive and Non-Recursive algorithms

Array as a data structure (characteristics, advantages, disadvantages), Representation of arrays: single and multidimensional, Address calculation using column and row major ordering; insertion and deletion in arrays; use of arrays for matrix representation and manipulation (addition, multiplication, transpose), complexity analysis for matrix multiplication; use of arrays for sparse polynomial representation and manipulation (addition and multiplication, evaluation); use of arrays for large integer representation and their addition

Unit II : Linked Lists; Stacks and Queues **16 Hours + 18 Hours**

Linked List as a data structure (characteristics, advantages, disadvantages); operations on lists (creation, insertion, deletion, traversal, merging, splitting); singly linked list (with one or two external pointers), doubly linked list, circular list; use of linked lists for polynomial representation and manipulation (addition and multiplication), and sparse matrix representation and manipulation (inputting, adding, and displaying in matrix form)

Stacks and Queues as data structures; implementation of stacks and queues using arrays and linked lists; Circular Queue, Priority Queue, D-Queue; Application of stacks : Conversion of infix(containing arithmetic operators including exponential operator and parenthesis) to postfix and prefix expressions; evaluation of postfix expression

Unit III : Trees and Graphs **18 Hours + 18 Hours**

Definition of tree as a data structure (Binary Trees and General Trees), Basic Terms (father, son, descendant, ancestor, height, depth, leaf, node, forest, ordered trees, strictly binary tree, complete binary tree, internal nodes,

external nodes); Representation of trees using arrays and linked lists, Binary tree traversal methods (pre-order, in-order, post-order), recursive and non-recursive algorithms for traversal methods, Binary search trees (creation, insertion and deletion of a node), threaded binary trees (construct and traverse a right in-threaded binary tree); Height balanced (AVL) binary trees (construct and traverse an AVL tree), multi-way search trees (construction and traversal); B-tree (construction and traversal of a B-tree of given order)

Definition of a graph, Basic Terms (vertex, arc, directed, undirected, cardinality, finite and infinite graph, incidence, adjacency, indegree, outdegree, path length, weighted graph, connected graph, cyclic and acyclic graph, symmetric graph, complete graph, sub-graph); Graph representation : Adjacency matrix, adjacency lists, incidence matrix, adjacency multi-lists; Traversal schemes : Depth first search, Breadth first search (Recursive and non-recursive algorithms); Shortest Path algorithms (Dijkstra's), Spanning tree, Minimal spanning tree algorithms (Kruskal's algorithm)

Unit IV : Searching and Sorting, and their complexity analysis **15 Hours + 15 Hours**

Linear and binary search, Indexed search, and their complexity analysis; Hashing, Hash Functions (division method, mid square method, folding), Analysis of ideal hash function; Conflict resolution (linear and quadratic probe, double hashing, separate chaining, coalesced chaining); Analysis of collision resolution techniques; Sorting algorithms(Insertion, Selection, Bubble, Quick, Merge, Radix, Heap) and comparison of their time complexity.

Practical Assignments

(Questions need not be restricted to this list)

1. The *median* of an array of numbers is the element m of the array such that half the remaining numbers in the array are greater than or equal to m and half are less than or equal to m, if the number of elements in the array is odd. If the number of elements is even, the median is the average of the two elements m_1 and m_2 such that half the remaining elements are greater than or equal to m_1 and m_2 and half the elements are less than or equal to m_1 and m_2. Write a C program to input numbers into an array and returns the median of the numbers in the array, using functions.
2. A complex valued matrix X is represented by a pair of matrices (A, B), where A contains real values and B contains imaginary part. Write a program to input values to these matrices, compute their product to give matrix Z, and display the three matrices X, Y, Z in matrix form. Determine the number of multiplications that will be done if X has m rows and n columns, and Y has p columns.
3. Write a program to calculate the address of a given element in an array declared as `float F[5][6][7][4];` and compare the result with that assigned by the compiler.
4. A vector is an array which can have its size increased as and when required. Elements can be deleted and inserted in sequential order. Write a program for implementation of vectors.
5. Write a menu-driven program to
   a) construct a singly linked list. Assume the information part of each node consists of only an integer key. Get input for each key from the keyboard. Assume the input is over when the user enters –1
   b) print the information from each node
   c) delete all nodes containing a given number
   d) Exit
6. Consider a set L, a linked list of n integers is given to you. Suppose, the nodes of the list are numbered from 1 to n. It is required to split the list L into 4 lists so that the first list contains the nodes of L numbered 1, 5, 9, 13 ... The second list contains the nodes numbered 2, 6, 10, 14 ... The third list contains the nodes of L numbered 3, 7, 11, 15, ... The fourth list contains the nodes of L numbered 4, 8, 12, 16 ... Write a program to create the list and perform the splitting.
7. Write a C function to insert a node appropriately to an already sorted list so that after insertion, the new list also becomes sorted. Take care of special cases such as inserting into an empty list. Use this function to write a program which accepts integers at the input and at the end produces a sorted list. Assume that if the integer read at the input is 0 then your program should stop.
8. Write a program to implement polynomial multiplication. Tes your program by inputting the following two polynomials given below.

   10 P^8 + 14 P^6 - 8 P^5 - 3 P^4 + P^2

3 P^4 + 5 P^3 - 2 P + 8

(^ is to be read as "raised to")

Store each term of the polynomial in a linked list in descending order of the index. Use separate linked lists for each polynomial. Obtain and store the product in a third linked list, and then print out all the three polynomials in a format similar to the one shown above, in descending order of index.

9. A bi-directional list is a list of elements that are linked in both ways. Both links are originating from a header. Construct a module with procedures for searching, inserting and deleting elements.

10. Write a program to represent a sparse matrix using linked list. Add together two such matrices, and display the original and resulting matrices in matrix form

11. Write a menu-driven program to implement a stack using array. The menu should have the following options:

    a) Push on to the stack
    b) Pop from the stack and print the value popped from the stack
    c) Merely print the value on top of the stack
    d) Exit

    Error trapping should be done for underflow and overflow. Available array space should be efficiently used (i.e. there cannot be overflow if there is more than 1 empty element in the array). Assume that the information part of a stack element is only an integer.

12. Write INSERT and DELETE functions in C language simulating insertion and deletion in circular queue which stores an array of characters.

13. A double-ended queue is a linear list in which additions and deletions may be made at either end of the queue. Write a C function to implement deque with desired functionality. Illustrate use of your function in an example problem, say, a queue of integers.

14. Devise a scheme to traverse a singly linked list in both directions by reversing the links during left to right traversal. Write a C program to implement this traversal scheme.

15. Write a C program to convert an expression from its infix form to its equivalent (a)postfix form, (b)prefix form. Assume the infix expression contains only operators +, -, /, *, ^. The operator '^' stands for exponentiation. The operands are all single digit integers. Display the resulting (a)postfix expression (b)prefix expression.

16. Write a program to input a postfix expression that consists of only single digit positive operands and the binary operators +, -, *, and /. Using a function, evaluate this postfix expression. The function should report if the postfix expression is invalid, else return its value. [For example, 2#2/4#6^7+ is a valid postfix expression (being the equivalent of the infix expression, 2-4/2+4*6+7) and its value is 31.00.]

17. Write a program to construct a binary search tree of integers using linked list. Assume the information part of each node consists of only an integer key. Get input for each key from the keyboard. Assume the input is over when the user enters -1. Next, print out the keys in ascending order of magnitude, using a non-recursive function.

18. Write a program to create a binary tree and to traverse the tree in

    a) Recursive and non-recursive pre-order
    b) Recursive and non-recursive in-order
    c) Recursive and non-recursive post-order

19. Implement a procedure for deleting an element X from a binary search tree.

20. Write a program to reconstruct a binary search tree given its pre-order and in-order traversal sequence.

21. Write a program to construct a right-in-threaded binary tree and traverse this tree.

22. Design and implement an algorithm for insertion of an element in AVL tree taking into account all possible conditions.

23. Represent a graph using adjacency matrix. Write a C procedure to transform an adjacency matrix based representation to a linked-list based representation.

24. Design a suitable representation so that a graph can be stored on a hard disk. Write a procedure adjacency matrix based representation.

25. Write a program to represent a graph and perform a non-recursive depth first search of an item in it.

26. Write a program to represent a graph and compute the shortest distance between two nodes in it.
27. Write a program to input some numbers into an array, and then sort them using various sorting techniques (selection sort, bubble sort, merge sort, quick sort, radix sort) and compare their time-complexities.
28. Write a C program to implement the Heap Sort. (Input some integers, sort them and print the sorted numbers. Entering 0 can be the signal that input of numbers is over.)
29. Write a program to input some numbers (at least 128 numbers, the more the better) from a file into two arrays A and B. Sort array B. Perform the linear search in array A and binary search in array B for a given number. Repeat these as many times as user decides and compare the time-complexity of the two search methods on the average.
30. Design and implement an algorithm to delete an identifier X from a hash table which uses hash function f and linear open addressing to resolve collisions. Your deletion scheme must ensure that correct search is possible even after deletion.

Instruction For Paper Setter

(The question papers will be set according to the following scheme)

Unit	Theory Questions		Practical Questions		
	To be set	To be answered	To be set	To be answered	Marks
I	2	1	2	1	15
II	3	2			
III	3	2	2	1	15
IV	2	1	2	1	10

Distribution of marks for practical

10% : Syntax and Input/Output screens
30% : Logic and efficiency (source code, pseudocode, algorithm)
20% : Error trapping (illegal or invalid input, stack overflow, underflow, insufficient physical memory, etc)
20% : Completion
20% : Result

Recommended Books

Text

1. **S. Chattopadhyay, D. Ghosh Dastidar, M Chattopadhyay,** *Data Structures Through C Language,* BPB Publications, 2001

Reference

1. **Y. Langsam, M.J. Augenstein, A.M. Tenenbaum,** *Data Structures Using C and C++,* Second Edition, Prentice Hall of India, 2000
2. **Seymour Lipschutz,** *Theory and Problems of Data Structures,* Schaum's Outline Series, International Edition, MacGraw Hill, 1986
3. **Niklaus Wirth,** *Algorithms + Data Structures = Programs,* Prentice Hall of India, 1998
4. **E. Horowitz, Sahni, D. Mehta,** *Fundamentals of Data Structures in C++,* Galgotia Publication, 2002
5. **Y.P. Kanetkar,** *Data Structures Through C Language,* BPB Publications, 2002

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Paper II (Elective 1): Visual Programming Using Visual Basic

Objective

The main objective of this paper is to give a strong foundation in Visual programming including Crystal Report, Menu Design, Database Management, Web Programming. It will help to develop powerful applications with less programming effort. Some advanced features such as Designing ActiveX control, Using API also have been included to familiarize the students with the new technologies. It will be the stepping stone to the next generation programming

Outline of the Course

Minimum Class Hours			Exam Time (Hours)		Marks			
Theory	Practical	Total	Theory	Practical	Theory	Practical	Internal	Total
60	60	120	2	3	50	40	10	100

Unit	Topics	Minimum Class Hours			Marks (Theory)
		Theory	Practical	Total	
I	Overview, Environment and Programming	12	12	24	10
II	Methods Programming and Error handling	12	12	24	10
III	Database Programming with Visual Basic	12	12	24	10
IV	Advanced Visual Basic	12	12	24	10
V	Web Programming with Visual Basic	12	12	24	10
Total		60	60	120	50

Detailed Syllabus

Unit I: Overview, Environment and Programming — 12+12 Hours

Overview: Visual Basic Application Types, Visual Basic Application Components- (Projects, Forms, Controls, Code modules, Class modules, User controls, Property pages)

VB Environment: Menu Bar, Toolbar, Toolbox, Form, Project explorer, Property window, Immediate window, Form layout window, Creating a project, Forms, Naming a project, Saving a project

Controls: Label control, TextBox control, Command Button, Frames, Option Buttons, Check Boxes, Picture control, Image Control, Shape control, Line control, Timer control, HscrollBar control, VscrollBar control, FileListBox control, DirListBox, DriveListBox control

List and Menus: List Box control, Combo Box Control, Menu System(Menu Standards, Menu editor, Common menu properties)

Events: Code window, Breakdown of an Event procedure, Form Events, Label events, TextBox events, Command Button events, Frame Events, Option button events, CheckBox events, Picture control events, Image control events, ListBox events, ListBox events, ComboBox events, Menu Events

Variables: Data types, Declaring variables, Scope and lifetime of a variable, Examples of variables, Variant data types

Arrays, Types and Constants: Arrays(Fixed size, Dynamic, Preserving array contents), Setting array boundaries, Array() functions, isArray() functions, Bounds checking, Clearing an array, Multidimensional arrays, User-defined types, Constants(Local constants, Public constants, Module-level, Built-in), Mathematical and Relational operators, Control Arrays

Unit II: More on Programming and Error Handling **12+12 Hours**

Conditional Logic and Looping: If...Then, Select...Case, Do...While, While...Wend, Loop...While, Do...Until, Loop...Until, For...Next, Nested constructs, Exit For/Exit Do, End/Sub/Exit Function

Procedures and Functions: Procedures, Functions, Parameters and Arguments, Call by Value and Call by Reference, Optional Arguments, Named Arguments

Built-in Functions: String Functions, Date Functions, Conversion Functions, Functions to test Data Types, Methods

DialogBoxes: MsgBox, InputBox, Common Dialog Control

Multiple Document Interface: What is MDI, Creating an MD form, Child menus in MDI applications, Arranging child forms, Tracking Child Windows, Unloading an MDI application

Error Handling: Error handling techniques, On Error GoTo, Err object (Err.Number, Err.Description), On error Resume Next, Errors in Call Stack, Turning Error handling Off, Creating a Global error handler

Unit III: Database Programming with Visual Basic **12+12 Hours**

The ADO data control: Getting at Data(The Jet Engine, ActiveX Data Object), Universal Data Access(OLEDB, ActiveX Data Object, ADO Features, ADO object hierarchy, Referencing ADO), Service Provider for ADO, The ADO Data Control, ADO control properties, Using the ADO Data Control

Data Control Programming: Recordset Properties, Order of events, Modifying Data Programmatically, Adding records, Detecting changes in data, Data Control Error Handling

Additional Data Control Topics: Other Data-aware controls Topics (Data-bound combo box, Data bound List Box, Synchronizing the List Box, Data bound Grid Control)

ActiveX Data Object: The Connection object (Properties, Methods, Creating), Recordset object (Properties, Methods, Types, Forward-only recordset), Command objects

Data Entry with ADO: Creating a new ADO project, Adding data, Editing data, Deleting data

Visual Database Tools: Data environment designer, Data view window, Query designer window, The database diagram window, Visual data manager

Creating Report with Crystal Report Pro: The Bands, Fields, Using Crystal Report Pro Writer, Calling The Report from within Visual Basic

Unit IV: Advanced Visual Basic **12+12 Hours**

ActiveX Controls: Toolbar control, Coolbar control, Status Bar, Image Combo, DateTimePicker control, MonthView control, Progress Bar Control, Slider Control, UpDown Control, TabStrip Control

Using the Windows API: Uses of API, Declaring API functions to VB, Calling API functions, API functions (SendMessage(), GetDriveType(), GetDiskFreeSpace(), GetFileAttributes(), GetComputerName(), GetUserName())

Building ActiveX Controls: On designing ActiveX controls, Interacting with a container(Extender and Ambient object), Designing property pages, Building a generic control (Creating a generic control, Adding property, The life of a control, Initializing a control and its properties, Key properties, Designing a alarm control), Enhancing the existing controls- an enhanced TextBox control

Unit V: Web Programming with Visual Basic **12+12 Hours**

Introduction to Web: Internet and Web protocols (HTML pages, Client-Server interactions, Scripting, DHTML).HTML Primer(URLs and hyperlinks, Structure of HTML documents, Basic HTML tags, Hyperlinks, Inserting graphics, Tables, Frames) Activating Client with VBScript (Forms and Controls, Embedding a script, Scripting an HTML page)

Visual Basic and Web: Web Browsing Objects (WebBrowser control, InternetExplorer control), Properties, Events and Methods of WebBrowser control, The Document Object (Properties and Methods), The History object, The Navigation object, Location object, The Link object

Active Server Pages: Client Server Interactions (Building a parameter string, Contacting a server, Connecting to Web Server), Creating an ASP page(Included files, Mixing server side and client side script), The Active Server Objects(Intrinsic objects, Basic objects, Response object, Request object, Server objects, Session Objects and Application Objects, Start and End events, Storing and recalling cookies), Using ActiveX Data Objects(Setting up an ODBC data structure, Opening a database, Building a recordset, Using the recordset)

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Practical Assignments

(Questions need not be restricted to this list)

Part A

1. Design a form and place a TextBox in it. Call it (assign its name property) txtInput. Place a Command Button and call it cmdExtract. Assign the caption property of the Command button as "Extract". Write a program to extract each digit or letter of a number, word or sentence that is entered in txtInput and display them in a second Text Box called txtOutput, one at a time on the click of a button.
2. A frmEmployee contains a TextBox (txtNumber) to enter number of employee records to be entered, two Command Buttons (cmdOK with the caption Ok and cmdClose with caption Close). As soon as a single digit number is entered, appropriate number of controls must be available in the form for entering Name, Address and Salary for the given number of employees. Write the code in the appropriate Event to accomplish this.
3. Design a form with suitable controls to input a single digit number and write appropriate event handlers to check if the number is automorphic or not. A number is called automorphic if the last digit of the square of the number is same as the number itself.(e.g. 6)
4. Design a form with suitable controls and write appropriate event handlers to list out all the Armstrong numbers within a given range of numbers 'm' to 'n'. A number is called an Armstrong number, if the number is equal to the sum of the cubes of the digits of the number.
5. Design a form with suitable controls and write appropriate event handlers to take in a string and determine whether the given string is palindrome or not.
6. Design a form with suitable controls and write appropriate event handlers to generate an Ordinary Calculator Program (Using Label, CommandButton). The calculator should support the facilities such as Addition, Subtraction, Multiplication, Division, and Storing in Memory, Clearing Memory and Adding to Memory etc. The display of the calculator should support up to 10 digits including decimal point. Your application should use control arrays
7. In the color code that is used in resistors, the different colors have values as follows: Black=0, Brown=1, Red=2, Orange=3, Yellow=4, Green=5, Blue=6, Violet=7, Gray=8 and White=9. The value of the resistor is indicated by drawing three colored bands round it. The first two bands indicate the first two digits in the numerical value of the resistance, while the third band is the decimal multiplier, i.e., it gives the number of zeros after the two digits. For example, if the bands have colors, Green-Blue-Orange, successively then the numerical value is 56000. Design a form with suitable controls and write appropriate event handlers to accept the colors from the user and print the equivalent numerical.
8. Design a form with suitable controls and write appropriate event handlers to generate the calendar of a given month. The user must enter the month and the year. Assume that 1st January 1900 was a Monday. Do not use the standard Visual Basic functions to generate the calendar.
9. Using functions write a program to calculate the simple interest accrued on a given principal using the formula SI = (Principal x Rate x Time)/100. The user input and the output thereof must be on different forms. The input form must have a textbox where the principal will be entered by the user, a vertical scroll bar for the rate of interest, and a listbox from where the user can select the time (in years.) On clicking a button, the function must calculate the SI taking values from the textbox, scrollbar and listbox, and the result shown in the second form. Provision must also be kept for adding and removing items to and from the listbox. The items in the listbox appear as: 1 year; 2 years; 3 years etc.....up to 10 years.
10. Write a program to calculate and display the factorial of a given number, using a recursive function.
11. Design a form with suitable controls and write appropriate event handlers to convert an input decimal number to a number with a user defined base (1 to 9), and vice versa.
12. Write a program to search for a particular word or pattern in a text and to display the position of the match. The match should also be selected. Do not use the standard VB library function *InStr()*
13. Develop an application providing the facilities for a stopwatch, a timer, and a daily alarm at a preset time, as desired by the user.
14. Load a picture on an appropriate control such that the position of the picture randomly changes within the form with time.

15. Write a program to convert a string to proper case. Do not use standard VB functions; use ASCII values to convert from one case to another.

16. Design a project that will enable you to explore through the directory structure and open applications also, using a drive listbox, directory listbox, and a file listbox. Also design a variation of this application using common dialog control.

17. On a form, place two picture boxes and an image box. Load a picture in the first picture box, draw a diagonal through it using the line function, and give it an appropriate color. Now, copy the contents of the first picture box to the second and also to the image box. Notice the differences.

18. Write a line of text and place it centered on a form. Ensure that the text remains centered even if the form is resized manually or otherwise.

19. Design a form with suitable controls and write appropriate event handlers to load all the Colours (Using VScrollBar, HScrollBar).

20. Develop an application where all possible colours can displayed in a picture box using the three primary colours red, green, blue, whose values are selected from three scrollbars.

21. Load a picture on an appropriate control such that the position of the picture randomly changes within the form with time.

22. A line of text Eg. "Over to Delhi for the second day's play." is entered by the user. Write a program to print the shortest and longest word so contained in the sentence.

23. Write a program to sort the elements of an array in descending order using bubble sort.

24. Write a program to search for an element in an array using binary search.

25. Develop a program to get the total file count and total size in a directory.

Part B

1. The following information is to be maintained regarding the users of electricity: Name, code and units consumed. Write a program that will take the name and units consumed and hence generate a bill. For the first 20 units cost is 30p/unit, for the next 20 units, 40p/unit, for the rest, 50p/unit. Make provisions for reading, editing and deleting data. Make provisions to keep the rates alterable. Use ADO data control.

2. A publishing company maintains records with the following information: Name of Author, Author Code, Name of Book, Book ID and Year of Publish. Make provisions to add, edit and delete records. Every time a new Author Name is added, the code must be generated, so also with the name of book and book ID. Use ADO objects(Connection, Recordset, Command etc)

3. Refer to the above question to design a Crystal Report to display the details of the books for a given Author and given Year of Publish . Design a Visual Basic form and write appropriate code to invoke the report.

4. Develop an application that will scan all the folders and the sub-folders therein of a particular drive and list them out in a richtextbox. This application should simulate the working of the DOS command DIR /S, the path of the folders should be displayed in bold. Also make provision for saving the output as a text file in a folder of user's choice and also to print the output.

5. Write a program that will enable the user to draw any shape – regular as well as free hand and will also allow filling the shape with color of user's choice. Note that this application window should always remain on top, even when it is not in focus.

6. Develop an application that allows the user to select a drive so that the application can list out the drive information viz., drive type, free disk space, current directory and the windows system directory in the drive.

7. Develop an application that will diagnose the current machine and list out computer name, number, currency, date, and time formats, time zone information, user logged in, name of the temp folder and that of the next temporary file.

8. Write a program that will shut down the system, or restart, or simply logout, depending on user's choice.

9. Create an HTML form with a Command Button captioned "Calculate" and other appropriate controls to take in parameters for calculating simple interest i.e Principal, Time, Rate of interest. On clicking the Button, the parameters should be passed to an ASP page in the Web Server which will calculate the Simple interest and display the result in the Client.

10. Create a Database in a Database Server with two tables –Bindata and Marks. The table Biodata contains the fields Name, RollNo(N,5)(RollNo is unique), Gender(C,1), State(C,15), District(C,15), Place(C,15), Class(C,3),Dob(Date), Caste(C,10) and the table Marks contains the fileds RollNo(N,5), Physics(N,2), Chemistry(N,2), Maths(N,2). Develop ASP page(s) to Add, Edit and Delete records from the table. Provisions should be made to display all the records of the given class with each one's average mark in a tabular format(Class can be selected from a ListBox)

Instructions For Paper Setter

(The question papers will be set according to the following scheme)

Theory			Practical			
Unit	To be set	To be answered	Part	To be set	To be answered	Marks
I	2	1	A	3	2	20
II	2	1				
III	2	1	B	2	1	20
IV	2	1				
V	2	1				

Distribution of marks for practical

10% : Syntax and Input/Output screens
30% : Logic and efficiency (source code, pseudocode, algorithm)
20% : Error trapping (illegal or invalid input, stack overflow, underflow, insufficient physical memory, etc)
20% : Compilation
20% : Result

Recommended Books

Text

1. **Paul D Sheriff,** *Paul Sheriff Teaches Visual Basic 6*, Prentice Hall of India,2001 (Unit 1,2,3,4)
2. **Evangelos Petroutsos** , *Mastering Visual Basic 6*, BPB Publication, 1998 (Unit 4,5)

References

1. **Michal C Amundsen and Curtiss L Smith,** *Teach Yourself Database Programming with Visual Basic 5 in 21 Days*; TechMedia , 1997.
2. **Peter Norton,** *Peter Norton's Guide to Visual Basic 6*, Techmedia, 1999
3. **Perry,** *Teach yourself Visual Basic 6 in 21 days*, Techmedia, 1998

Paper II (Elective 2): Visual Programming Using VB.NET

Objective

Visual Basic.NET is the latest version of Visual Basic, the most significant evolutionary change yet in the language. At its heart is the totally new .NET framework, a rich and powerful set of classes that provides support for just about any imaginable area of programming – desktop, Internet, database, and so on. The intent of this course is to teach

- the language Visual Basic,
- the .NET framework,
- programming logic,
- database programming, and
- Web application.

Outline of the Course

Minimum Class Hours			Exam Time (Hours)		Marks			
Theory	Practical	Total	Theory	Practical	Theory	Practical	Internal	Total
60	60	120	2	3	50	40	10	100

Unit	Topic	Minimum Class Hours			Marks (Theory)
		Theory	Practical	Total	
I	Computer Arithmetic & Solutions to Single Polynomial	20	20	40	14
II	Solutions of Sets of Linear Equations & Polynomial Interpolation	20	20	40	18
III	Approximation of Functions, Differentiation and Integration & Differential Equations	20	20	40	18
TOTAL		60	60	120	50

Detailed Syllabus

Unit I: Language Fundamentals, Forms & Controls **12 Hours + 12 Hours**

Language Fundamentals

Comments, Data Storage – Variables, Variable Type, Variable Names, Variable Declarations – explicit and implicit; Scope and lifetime of variables - Namespaces and Shadowing, Binding, Constants, Symbolic Constants; Arrays – one and multi dimensional, Changing size of an array; Structures, Enumerations; Arithmetic and string operators, operator precedence, Expressions, Logical operators

.NET framework, common language runtime, Value types and reference types

Forms and Controls

Control Class, ScrollableControl Class, ContainerControl Class, Form Class, UserControl Class.

Forms - Behaviour, Appearance, Layout and Design, Methods and Events, Adding controls, locking controls, startup form

Controls - Common Properties and Methods, Label, LinkLabel, TextBox, MainMenu, CheckBox, RadioButton, ListBox, ComboBox, GroupBox, Panel, TabControl, Timer, StatusBar, ImageList, ContextMenu; Outline of other

controls – CheckedListBox, PictureBox, DataGrid, HScrollBar and VScrollBar, ListView, TreeView, DateTimePicker, MonthCalendar, PrintDialog, PrintPreviewDialog, PrintPreviewControl, PrintDocument, PageSetupDialog, OpenFileDialog, SaveFileDialog, Toolbar, Splitter, DomainUpDown, NumericUpDown, TrackBar, ProgressBar, RichTextBox, HelpProvider, ToolTip, Notifyicon, FontDialog, ColorDialog, ErrorProvider, CrystalReportViewer; Mouse related events, Keyboard related events

Unit II: Decision, Loops, Procedures & Exception Handling **12 Hours + 12 Hours**

Decision and Loop Structure
Decision Structures – If ... Then ... Else, Select Case; Loop Structures – For ... Next, Do ... Loop, While ... End While, With ... End With, For Each ... Next, Exit

Procedures
Sub Procedures and Function Procedures, Passing arguments, Parameter Array Arguments

Exception Handling
Structured Exception handling, Catch Expressions, Exception class and its derived classes, Throw statement. Unstructured Exception Handling, On Error statement, Resume statement, Err object.

Unit III: Object Oriented Programming & Custom Controls **12 Hours + 12 Hours**

Object Oriented Programming
OOP Fundamentals – Class and objects, Creating Classes, Namespaces and Classes, Class Properties, Class Methods, Class Constructors, Shared Methods, Shared Variables, Class Events, Class Access Options, Structures, Interfaces, Inheritance, Subclassing, Base Class Design Considerations, Me Keyword, MyBase Keyword, MyClass Keyword

Creating Custom Controls
Using Windows Control Library- Subclassing Existing Control, Custom Properties, Custom Methods, Custom Event Handlers, Using Custom Control, Creating UserControl Control-Design Considerations, UserControl Events

Unit IV: Console Applications, MDI Applications, Library Functions & Files **12 Hours + 12 Hours**

Console Applications
Console Fundamentals, Console Class, Command Line Arguments, Redirecting Input and Output, Errors in Console Applications

MDI Applications
MDI Basics, Creating MDI Forms, Child Window List, Child Forms

Library Functions
String Class - Chars(), Length(), CompareTo(), EndsWith(), StartsWith(), Equals(), IndexOf(), LastIndexOf(), Insert(), PadLeft(), PadRight(), Remove(), Replace(), SubString(), ToLower(), ToUpper(), Trim(), TrimEnd(), TrimStart()

Math Class - Abs(), Acos(), Asin(), Atan(), Ceiling(), Cos(), Exp(), Floor(), IEEERemainder(), Log(), Log10(), Max(), Min(), Pow(), Round(), Sign(), Sin(), Sqrt(), Tan(), Math:E, Math:PI; Generating Random Numbers

DateTime - DateTime Structure, DateTime Constructors, Date(), Day(), DayOfWeek(), DayOfYear(), DaysInMonth(), Hour(), IsLeapYear(), Minute(), Month(), Now(), Second(), Ticks(), TimeOfDay(), Today(), Year(), Compare(), Equals(), Add(), AddDays(), AddHours(), AddMinutes(), AddMonths(), AddSeconds(), AddYears(), Subtract(), Parse(), ToLongDateString(), ToLongTimeString(), ToShortDateString(), ToShortTimeString(), ToString(), TimeSpan Constructors, Calendar Class

File Management
File Fundamentals, Exceptions in File Access, File Access, File Class, FileStream Class, BinaryReader Class, Closing Streams, BinaryWriter Class, StreamReader Class, StreamWriter Class, FileInfo Class, Working with Directories and Drives

Unit V: Database and Web Programming **12Hours + 12 Hours**

ADO.NET
SqlConnection Class, OleDbConnection Class, SqlAdapter Class, OleDbAdapter Class, DataSet Class, DataView Class, Binding Controls

ASP.NET
Designing Visual Interface, Writing Code, Controls for Web Applications, PageLoad() Event, Session Object, Application Object, Events in Web Application

Web Form Controls

Label, TextBox, Button, HyperLink, ListBox, Image, Panel, Literal, Validation. Properties, Methods and Events of Web Controls

Database Access in Web Applications
DataReader Class, Repeater Control, DataList Control, DataGrid Control

Introduction to Web Services: Creating Simple Web Services

Using Windows API
Uses of API, Calling API Functions. GetDriveType(), GetDriveFreeSpace(), GetFileAttributes(), GetUserName(). GetComputerName()

Practical Assignments

(Questions need not be restricted to this list)

Part A

1. Design a form and place a TextBox in it. Call it (assign its name property) txtInput. Place a Command Button and call it cmdExtract. Assign the caption property of the Command button as "Extract". Write a program to extract each digit or letter of a number, word or sentence that is entered in txtInput and display them in a second Text Box called txtOutput one at a time on the click of a button.
2. A frmEmployee contains a TextBox (txtNumber) to enter number of employee records to be entered and two Command Buttons (cmdOK with the caption Ok and cmdClose with caption Close). As soon as a single digit number is entered, appropriate number of controls must be available in the form for entering Name, Address, Salary for the given number of employees. Write the code in appropriate Event to accomplish these.
3. Design a form with suitable controls to input a single digit number and write appropriate event handlers to check if the number is automorphic or not. A number is called automorphic if the last digit of the square of the number is same as the number itself.(e.g., 6)
4. Design a form with suitable controls and write appropriate event handlers to list out all the Armstrong numbers within a given range of numbers 'm' to 'n'. A number is called an Armstrong number if the number is equal to the sum of the cubes of the digits of the number.
5. Design a form with suitable controls and write appropriate event handlers to take in a string and determine whether the given string is palindrome or not.
6. Design a form with suitable controls and write appropriate event handlers to generate an Ordinary Calculator Program (Using Label, CommandButton). The calculator should support the facilities such as Addition, Subtraction, Multiplication, Division, Storing in Memory, Clearing Memory and Adding to Memory etc. The display of the calculator should support up to 10 digits including decimal point. Your application should use control arrays
7. In the color code that is used in resistors, the different colors have values as follows: Black=0, Brown=1, Red=2, Orange=3, Yellow=4, Green=5, Blue=6, Violet=7, Gray=8 and White=9. The value of the resistor is indicated by drawing three colored bands round it. The first two bands indicate the first two digits in the numerical value of the resistance, while the third band is the decimal multiplier, i.e., it gives the number of zeros after the two digits. For example, if the bands have colors, Green-Blue-Orange, successively, then the numerical value is 56000. Design a form with suitable controls and write appropriate event handlers to accept the colors from the user and print the equivalent numerical.
8. Design a form with suitable controls and write appropriate event handlers to generate the calendar of a given month. The user must enter the month and the year. Assume that 1st January 1900 was a Monday. Do not use the standard Visual Basic functions to generate the calendar.
9. Using functions, write a program to calculate the simple interest accrued on a given principal using the formula SI = (Principal x Rate x Time)/100. The user input and the output thereof must be on different forms. The input form must have a textbox where the principal will be entered by the user, a vertical scroll bar for the rate of interest, and a listbox from where the user can select the time (in years.) On clicking a button, the function must calculate the SI taking values from the textbox, scrollbar, and listbox, and the result shown in the second form. Provision must also be kept for adding and removing items to and from the listbox. The items in the listbox appear as: 1 year, 2 years, 3 years etc..... up to 10 years.
10. Write a program to calculate and display the factorial of a given number, using a recursive function.
11. Design a form with suitable controls and write appropriate event handlers to convert an input decimal number to a number with a user defined base (1 to 9), and vice versa.

12. Write a program to search for a particular word or pattern in a text and to display the position of the match. The match should also be selected. Do not use the standard VB library function *InStr()*.
13. Develop an application providing the facilities for a stopwatch, a timer, and a daily alarm at a preset time, as desired by the user.
14. Load a picture on an appropriate control such that the position of the picture randomly changes within the form with time.
15. Write a program to convert a string to proper case. Do not use standard VB functions; use ASCII values to convert from one case to another.
16. Design a project that will enable you to explore through the directory structure and open applications also, using a drive listbox, directory listbox, and a file listbox. Also design a variation of this application using common dialog control.
17. On a form, place two picture boxes and an image box. Load a picture in the first picture box, draw a diagonal through it using the line function, and give it an appropriate color. Now, copy the contents of the first picture box to the second and also to the image box. Notice the differences.
18. Write a line of text and place it centered on a form. Ensure that the text remains centered even if the form is resized manually or otherwise.
19. Design a form with suitable controls and write appropriate event handlers to load all the Colours (Using VScrollBar, HScrollBar).
20. Develop an application where all possible colours can displayed in a picture box using the three primary colours red, green, blue, whose values are selected from three scrollbars.
21. Load a picture on an appropriate control such that the position of the picture randomly changes within the form with time.
22. A line of text E.g." Over to Delhi for the second day's play." is entered by the user. Write a program to print the shortest and longest word so contained in the sentence.
23. Write a program to sort the elements of an array in descending order using bubble sort.
24. Write a program to search for an element in an array using binary search.
25. Develop a program to get the total file count and total size in a directory.

Part B

1. The following information is to be maintained regarding the users of electricity: Name, code and units consumed. Write a program that will take the name and units consumed, and hence generate a bill. For the first 20 units cost is 30p/unit, for the next 20 units, 40p/unit, for the rest, 50p/unit. Make provisions for reading, adding and deleting data. Make provisions to keep the rates alterable. Use ADO data control.
2. A publishing company maintains records with the following information: Name of Author, Author Code, Name of Book, Book ID and Year of Publication. Make provisions to add, edit and delete records. Every time a new Author Name is added, the code must be generated, so also with the name of book and book ID. Use ADO objects(Connection, Recordset, Command etc)
3. Refer to the above question to design a Crystal Report to display the details of the books for a given Author and given Year of Publication. Design a Visual Basic form and write appropriate code to invoke the report.
4. Develop an application that will scan all the folders and the sub-folders therein of a particular drive and list them out in a richtextbox. This application should simulate the working of the DOS command DIR /S, the path of the folders should be displayed in bold. Also make provision for saving the output as a text file in a folder of user's choice and also to print the output.
5. Write a program that will enable the user to draw any shape– regular as well as free hand and will also allow filling the shape with color of user's choice. Note that this application window should always remain on top, even when it is not in focus.
6. Develop an application that allows the user to select a drive so that the application can list out the drive information viz., drive type, free disk space, current directory and the windows system directory in the drive.
7. Develop an application that will diagnose the current machine and list out computer name, number, currency, date, and time formats, time zone information, user logged in, name of the temp folder and that of the next temporary file.

8. Write a program that will shut down the system, or restart, or simply logout, depending on user's choice.
9. Create a Database in a Database Server with two tables –Biodata and Marks. The table Biodata contains the fields Name, RollNo(N, 5)(RollNo is unique), Gender(C,1), State(C,15), District(C,15), Place(C,15), Class(C,3),Dob(Date), Caste(C,10) and the table Marks contains the fields RollNo(N,5), Physics(N,2), Chemistry(N,2), Maths(N,2). Develop ASP page(s) to Add, Edit and Delete records from the table. Provision should also be made to display all the records of a given class, along with each ones' average mark, in a tabular format (the class can be selected from a listbox).
10. Develop a web page that will calculate the monthly installment for a loan amount, given the rate of interest and its term.
11. Develop a web page with a counter that displays the number of visits to the site.
12. Develop a program to let user place order for ice cream over the net. This should allow selection of one or more flavours (vanilla, strawberry, etc.) and then select the item (cone, double cone, cups, etc.). The order summary should be displayed on the page once the user clicks on the *Order* button.
13. Develop a web site for a commercial organisation, where the order for goods can be placed. There should be possibility for adding new items or removing items from the shopping cart.
14. Develop a web site for registering the details of alumni for an educational institution. Make provisions for listing out the entries belonging to a particular batch.
15. Create a web service to add numbers together. Also develop a client program that uses the web service.

Instruction to Paper Setter

(The question papers will be set according to the following scheme)

Theory Questions			Practical Questions			
Unit	To be set	To be answered	Part	To be set	To be answered	Marks
I	2	1	A	3	3	20
II	2	1				
III	2	1	B	2	1	20
IV	2	1				
V	2	1				

Distribution of marks for practical

10% : Syntax and Input/Output screens
30% : Logic and efficiency (source code, pseudocode, algorithm)
20% : Error trapping (illegal or invalid input, stack overflow, underflow, insufficient physical memory, etc)
20% : Completion
20% : Result

Recommended Books

Text

1. **Peter Aitken**, *Visual Basic .NET Programming*, Dreamtech, New Delhi, 2002
2. **Michael Halvorson**, *Microsoft Visual Basic .NET Step by Step*, Prentice Hall of India Pvt. Ltd., New Delhi, 2002

Reference

1. **Bill Evjen et al.**, *Visual Basic .NET Programming Bible*, IDG Books India (P) Ltd., New Delhi, 2002
2. **Paulo Sanchez et al.**, *Microsoft Visual Basic .NET Professional Projects*, Prentice Hall of India Pvt. Ltd., New Delhi, 2002

Paper II (Elective 3) :Computer Oriented Numerical Methods

Objective

The objective of this paper is to familiarize the students with algorithms to solve numerical problems arising in scientific, engineering and statistical work. The emphasis should be on algorithms and their applications rather than on their theoretical derivation.

Outline of the Course

Minimum Class Hours			Exam Time (Hours)		Marks			
Theory	Practical	Total	Theory	Practical	Theory	Practical	Internal	Total
60	60	120	2	3	60	40	10	100

Unit	Topic	Minimum Class Hours			Marks (Theory)
		Theory	Practical	Total	
I	Computer Arithmetic & Solutions to Single Polynomial	20	20	40	14
II	Solutions of Sets of Linear Equations & Polynomial Interpolation	20	20	40	18
III	Approximation of Functions, Differentiation and Integration & Differential Equations	20	20	40	18
TOTAL		60	60	120	50

Unit I: Computer Arithmetic & Solutions to Single Polynomial **20 Hours+20 Hours**

Computer Arithmetic : normalised floating point representation of real numbers and operations using it, normalisation and its consequences.

Errors in Arithmetic Operations : types and measurement, absolute and relative error; approximation and significant figures.

Solution of a Single Polynomial or Transcendental Equation : Method of bisection, false position, Newton-Raphson method, secant method; rate of convergence of iterative methods (definition only), comparison of the methods.

Unit II: Solutions of Sets of Linear Equations & Polynomial Interpolation **20 Hours+20 Hours**

Solution of Sets of Linear Equations : Gauss elimination method, pivotal condensation, ill-conditioned equations and iterative refinement; Gauss-Seidel iterative method.

Polynomial Interpolation : Lagrange's interpolating polynomial; difference tables and Newton's divided difference interpolating polynomial; Newton-Gregory forward and backward difference interpolating polynomials.

Unit III: Approximation of Fn, Differentiation/Integration & Differential Eqns **20 Hours+ 20 Hours**

Approximation of Functions using Taylor's series.

Numerical Differentiation and Integration : numerical differentiation; quadrature formulae; trapezoidal rule, Simpson's one-third rule, Simpson's one-eight rule.

Solution of Differential Equations : Euler's method, second and fourth order Runge-Kutta methods, predictor-corrector method for solving first order, first degree differential equations.

Instruction to Paper Setter

(The question papers will be set according to the following scheme)

Theory Questions			Practical Questions		
Unit	To be set	To be answered	To be set	To be answered	Marks
I	2	1	2	1	10
II	2	1	2	1	15
III	2	1	2	1	15

Distribution of marks for practical

10% : Syntax and Input/Output screens
30% : Logic and efficiency (source code, pseudocode, algorithm)
20% : Error trapping (illegal or invalid input, stack overflow, underflow, insufficient physical memory, etc)
20% : Completion
20% : Result

Recommended Books

Text

1. **V. Rajaraman**, *Computer Oriented Numerical Methods*, Prentice-Hall of India, New Delhi

Reference

1. **Rutishch Stoer**: *Computer Oriented Numerical Methods*, Springer-Verlag, 1980.
2. **E.V. Krishnamurthy, S.K. Sen**, *Computer Based Numerical Algorithms*, East West Press, 1984.
3. **M.K. Jain, S.R.K. Iyengar, R.K. Jain**, *Numerical Methods: Problems and Solutions*, New Age Int. (P) Ltd., New Delhi, 1995.
4. **M.K. Jain, S.R.K. Iyengar, R.K. Jain**, *Numerical Methods for Scientific and Engineering Computation*, New Age Int. (P) Ltd., New Delhi, 1993.

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Paper III: Computer Organization and Architecture

Objective

The objective of the course is to provide the students with the basic knowledge necessary to understand the operation of digital computers. It covers the organization, architecture and design associated with computer hardware.

A prior knowledge of Boolean Algebra, number systems and gates will be helpful to the student.

Outline of the Course

Minimum Class Hours	Exam Time (Hours)	Marks		
Total	Total	Theory	Internal Assessment	Total
120	3	90	10	100

Unit	Topic	Class Hours	Marks
I	Digital Logic Circuits, Digital Components	20	15
II	Register Transfer and Microoperations, Basic Computer Organization and Design	20	15
III	Programming the Basic Computer, Computer Arithmetic	20	15
IV	Central Processing Unit, Microprogrammed Control	20	15
V	Multiprocessors, Pipeline and Vector Processing	20	15
VI	Input-Output Organization, Memory Organization	20	15
TOTAL		120	90

Detailed Syllabus

Unit I: Digital Logic, Circuits, Digital Components **20 Hours**

Combinational Circuits (Half -Adder, Full-Adder Binary Parallel Adder, BCD Adder, Universal Property of NAND and NOR gates, Combinational Circuits using NAND and NOR gates); **Flip flops** (SR, D, JK, T, Master Slave, Edge-Triggered, Excitation Tables); *Sequential Circuits* (Latches, Flip-Flop Input Equations, State Table, State Diagram, Design Example, Design Procedure)

Integrated Circuits (Digital Logic Families and Integrated Circuits); *Decoders* (NAND Gate Decoder, Decoder Expansion, Encoders); *Multiplexers* (4 to 1 Line Multiplexer, Data Selector); *Demultiplexer; Code Converter; Registers* (Register with Parallel Load); *Shift Registers* (Bidirectional Shift Registers with Parallel Load, Serial Register); *Binary Counters* (Binary Counter with Parallel Load, Ripple Counter); *Memory Unit* (Random-Access Memory, Read-Only Memory, Types of ROMs)

Unit II: Register Transfers, Microoperations, Basic Computer Organization & Design **20 Hours**

Register Transfer; Control Function; Bus and Memory Transfers (Three-State Bus Buffers, Memory Transfer); *Arithmetic Microoperations* (Binary Adder, Binary Adder-Subtractor, Binary Incrementer, Arithmetic Circuit); *Logic Microoperations* (List of Logic Microoperations, Hardware Implementation, Some Applications (viz. Selective-Set, Selective-Complement, Selective-Clear, Mask, Insert, Clear Operations); *Shift Microoperations* (Hardware Implementation); *Arithmetic Logic Shift Unit* (Function Table for Arithmetic Logic Shift Unit)

Instruction Codes (Stored Program Organization, Indirect Address); *Computer Registers; Common Bus Systems; Computer Instructions* (Instruction Set Completeness); *Timing and Control* (Clock Pulses, Hardwired Control, Microprogrammed Control, Control Unit, Timing Signals); *Instruction Cycle* (Fetch and Decode, Determine the Type of Instruction, Register-Reference Instructions); *Memory-Reference* **Instructions** (AND to AC, ADD to AC, LDA: Load to AC, STA: Store AC, BUN: Branch Unconditionally, BSA: Branch and Save Return Address, ISZ: Increment and Skip If Zero, Control Flowchart); *Input-Output and Interrupt* (Input-Output Configuration, Input-Output Instructions, Program Interrupt, Interrupt Cycle); *Computer Description* (Flowchart for Basic Computer); *Design of Basic Computer* (Control of Logic Gates, Control of Registers and Memory, Control of Single Flip-Flops, Control of Common Bus); *Design of Accumulator Logic* (Control of AC Register, Adder and Logic Circuit)

Unit III: Programming the Basic Computer, Computer Arithmetic **20 Hours**

Introduction (Instruction Set); *Machine Language* (Example of a Binary Program to Add Two Numbers); *Assembly Language* (Rules of the Language, An Example-To Subtract two numbers, Translation to Binary); *The Assembler* (Representation of Symbolic Program in Memory, First Pass, Second Pass); *Program Loops* (Using an example of a Fortran Program to find the Sum of 100 Integer Numbers); *Programming Arithmetic and Logic Operations* (Multiplication Program, Double-Precision Addition, Logic Operations, Shift Operations); *Subroutines*(Subroutines Parameters and Data Linkage); *Input-Output Programming*(Character Manipulation, Program Interrupt)

Introduction (Definition of Algorithm); *Addition and Subtraction* (Addition and Subtraction with Signed-Magnitude Data, Hardware Implementation, Hardware Algorithm, Addition and Subtraction with Signed-2's Complement Data); *Multiplication Algorithms* (Hardware Implementation for Signed-Magnitude Data, Hardware Algorithm, Booth's Multiplication Algorithm, Array Multiplier); *Division Algorithms* (Hardware Implementation for Signed-Magnitude Data, Divide Overflow, Hardware Algorithm viz, Restoring Method, Other Algorithms viz. Comparison and Non-Restoring Method); Floating-*Point Arithmetic*

Operations (Basic Considerations, Register Configuration, Addition and Subtraction, Multiplication, Division)

Unit IV: Central Processing Unit, Microprogrammed Control **20 Hours**

Introduction to Major Components of a CPU, General Register Organization (Control Word, Examples of Microoperations); *Stack Organization* (Register Stack, Memory Stack, Reverse Polish Notation, Evaluation of Arithmetic Expressions); *Instruction Formats* (Three-Address Instructions, Two-Address Instructions, Zero-Address Instructions, RISC Instructions); *Addressing Modes* (Numerical Example with a Tabular List that shows the values of the Effective Address and Operand loaded into AC for the Nine Addressing Modes); *Data Transfer and Manipulation*(Data Transfer Instructions, Data Manipulation Instructions, Arithmetic Instructions, Logical and Bit Manipulation Instructions, Shift Instructions); *Program Control*(Status Bit Conditions, Conditional Branch Instructions, Subroutine Call and Return, Program Interrupt, Types of Interrupts); *Reduced Instruction Set Computer*(CISC Characteristics, RISC Characteristics, Overlapped Register Windows, Berkeley RISC 1)

Control Memory (Control Word, Microinstruction, Microprogram, Control Memory, Control Address,Register, Sequencer, Pipeline Register, Hardwired Control); *Address Sequencing* (Conditional Branching, Mapping of Instruction, Subroutines); *Microprogram Example* (Computer Configuration, Microinstruction Format, Symbolic Microinstructions, The Fetch Routine, Symbolic Microprogram, Binary Microprogram); *Design of Control Unit* (Microprogram Sequencer)

Unit V: Multiprocessors, Pipeline and Vector Processing **20 Hours**

Characteristics of Multiprocessors (MIMD, Microprocessor, VLSI, Tightly Coupled, Loosely Coupled); *Flynn's Classification*; *Interconnection Structures* (Time-Shared Common Bus, Multiport Memory, Crossbar Switch, Multistage Switching Network, Hypercube Interconnection); *Interprocessor Arbitration* (System Bus, Serial Arbitration Procedure, Parallel Arbitration Logic, Dynamic Arbitration Algorithms); *Interprocessor Communication, Synchronization and Mutual Exclusion with a Semaphore*, *Cache Coherence*(Conditions for Incoherence, Solution to the Cache Coherence Problem)

Parallel Processing (Throughput, Multiple Functional Units, SIMD, MIMD); *Pipelining* (Example of Addition and Multiplication of a stream of numbers, General Considerations – viz. Task, Space/Time Diagram, Speedup); *Arithmetic Pipeline* (Example of Floating-Point Addition and Subtraction); *Instruction Pipeline* (Example- Four Segment Instruction Pipeline, Data Dependency, Handling of Branch Instructions); *RISC Pipeline* (Example-Three Segment Instruction Pipeline, Delayed Load, Delayed Branch); *Vector Processing*(Vector Operations, Matrix Multiplication, Memory Interleaving and Supercomputers); *Array Processors*(Attached Array Processor, SIMD Array Processor)

Unit VI: Input-Output Organization and Memory Organization: **20 Hours**

Peripheral Devices; ASCII Alphanumeric Characters; Byte, Input Output Interface (I/O Bus and Interface Modules, I/O versus Memory Bus, Isolated versus Memory-Mapped I/O, Example of I/O Interface- I/O port); *Asynchronous Data Transfer* (Strobe Control, Handshaking, Asynchronous Serial Transfer, Asynchronous Communication Interface, First-In, First-Out Buffer); *Modes of Transfer* (Example of Programmed I/O, Interrupt-Initiated I/O, Software Considerations); *Priority Interrupt* (Daisy-Chain Priority, Parallel Priority Interrupt, Priority Encoder, Interrupt Cycle, Software Routines, Initial and Final Operations); *Direct Memory Access*(DMA Controller, DMA Transfer); *Input-Output Processor*(CPU-IOP Communication, IBM 370 I/O Channel, Intel 8089 IOP); *Serial Communication*(Character-Oriented Protocol, Transmission Example –viz. Typical Transmission from Terminal to Processor and Transmission from Processor to Terminal, Data Transparency, Bit-Oriented Protocol)

Memory Hierarchy (Auxiliary and Cache Memory, Multiprogramming); *Main Memory* (RAM and ROM Chips,

Memory Address Map, Memory Connection to CPU); *Auxiliary Memory* (Magnetic Disks, Magnetic Tape); *Associative Memory* (Hardware Organization, Match Logic, Read Operation, Write Operation); *Cache Memory* (Associative Mapping, Direct Mapping, Set-Associative Mapping, Writing into Cache, Cache Initialization); *Virtual Memory* (Address Space and Memory Space, Address Mapping using Pages, Associative Memory Page Table, Page Replacement); *Memory Management*(Segmented-Page Mapping, Numerical Example-Logical and Physical Address, Logical and Physical Address Memory Assignment, Logical to Physical Memory Mapping, Memory Protection)

Instruction for Paper Setter

(The question papers will be set according to the following scheme)

Unit	Questions	
	To be set	To be answered
I	2	1
II	2	1
III	2	1
IV	2	1
V	2	1
VI	2	1

Recommended Books

Text

1. **M. Morris Mano**, *Computer System Architecture*, Prentice Hall of India Pvt. Ltd., New Delhi, Third Edition, 2002

References

1. **M. Morris Mano**, *Digital Logic and Computer Design*, Prentice Hall of India Pvt. Ltd., New Delhi, 1994
2. **P Pal Choudhuri**, *Computer Organization and Design*, Prentice Hall of India Pvt. Ltd., New Delhi, Second Edition, 2002
3. **John P. Hayes**, *Computer Architecture and Organization*, McGraw Hill, New York, 1988
4. **William Stallings**, *Computer Organization and Architecture*, Prentice Hall of India Pvt. Ltd., New Delhi, Sixth Edition, 2002
5. **Andrew Tanenbaum**, *Structured Computer Organization*, Prentice Hall, Englewood Cliffs, NJ, 1999
6. **D. M. Dhamdhere**, *Introduction to System Software*, Tata McGraw Hill, New Delhi, 1986

Paper IV: Software Engineering

Objective

The objective of this paper is to provide a broad understanding of system development concepts. It provides the students with a sense of confidence to develop new systems. The study of design, specification and verification are basic activities that must be learned and applied throughout the software life cycle. It covers a framework for studying and evaluating software tools, and stresses the importance of theory in the development of software.

Outline of the Course

Minimum Class Hours	Exam Time (Hrs)	Marks		
		External	Internal	Total
60	2	40	10	50

Unit	Topic	Minimum Class Hours	Marks
I	Introduction To Software Engineering	12	8
II	Design And Specification	18	12
III	Verification And Testing	12	8
IV	Software Production, Tools And Management Of Software Engineering	18	12
TOTAL		60	40

Detailed Syllabus

Unit I: Introduction to Software Engineering — 12 Hours

Preview to Software Engineering - The Role of Software Engineering in System Design, The Role of the Software Engineer, The Software Life Cycle, The Relationship of Software Engineering to Other Areas of Computer Science (Programming Languages, Operating Systems, Databases, Artificial Intelligence, Theoretical Models)

Software: Its Nature and Qualities - Classification of Software Qualities (External Versus Internal qualities, Product and Process Qualities), Representative Qualities (Correctness, Reliability and Robustness, Performance, Usability, Verifiability, Maintainability, Reusability, Portability, Understandability, Interoperability, Productivity, Timeliness, Visibility), Quality Requirements in Different Application Areas (Information Systems, Real-Time Systems, Distributive Systems, Embedded Systems), Measurement of Quality

Software Engineering Principles - Rigor and Formality, Separation of Concerns, Modularity, Abstraction, Anticipation of Change, Generality, Incrementality, Case Study (Application of Software Engineering Principles to Compiler Construction)

Unit II: Design and Specification — 18 Hours

Design and Software Architecture - The Software Design Activity and its Objective (Design for Change, Product Families), Modularization Techniques (The Module Structure and its Representation, Interface Implementation and Information Hiding, Design Notations, Categories of Modules, Some specific techniques for Design for Change, Stepwise Refinement, Top Down Versus Bottom Up Design), Handling Anomalies, Object Oriented Design (Generalization and Specialization, Associations, Aggregation), Architecture and Components (Standard Architectures)

Specification - The Uses of Specifications, Specification Qualities, Classification of Specification Styles, Verification of Specification, Operational Specifications (Data Flow Diagrams, UML Diagrams for Specifying Behaviors), Descriptive Specifications (Entity Relationship Diagrams, Logic Specifications), Decision Tables, Decision Trees, Data Dictionary

Unit III: Verification and Testing **12 Hours**

Goals and Requirements of Verification, Testing, Goals for Testing, White - Box testing, Black – Box testing Testing and modularity, Bottom -up and Top down integration, testing object oriented programs, system testing, Separate Concerns in The Testing Activity (overload testing, testing for robustness, regression testing, testing concurrent and real time system), Analysis (Informal Analysis Techniques), Debugging

Unit IV: Software Production, Tools and Management of Software Engineering **18 Hours**

The Software Production Process - Software Process Model, Importance of Software Process Models, The Main Activities of Software Production (Feasibility Study, Eliciting, Understanding and Specifying Requirements, Definition of the Software Architecture and Detailed Design, Coding And Module Testing, Integration and System Testing, Delivery, Deployment and Maintenance, Other Activities), An Overview of Software Process Models (Waterfall Models, Evolutionary Models), Organizing The Process (Structured Analysis/Structured Design, The Unified Software Development Process)

Management Of Software Engineering - Management Functions, Project Planning (Software Productivity, People and Productivity, Cost estimation (Predictive Models of Software cost, COCOMO, COCOMO II)), Project Control (Work breakdown Structures, Gantt Charts, PERT Charts, Dealing with Deviations from the Plan), Organization (Centralized-Control Team Organization, Decentralized-Control Team organization, Mixed-Control Team Organizations), Risk Management (Typical Management Risks in Software Engineering)

Software Engineering Tools and Environments - Historical Evolution of Tools and Environments, representative Tools (Editors, Linkers, Interpreters, Code Generators, Debuggers, Tools Used in Software Testing, Graphical User Interface Tools)

Instruction to Paper Setter

(The question papers will be set according to the following schema)

Unit	Questions	
	To be Set	To be Answered
I	2	1
II	3	2
III	2	1
IV	3	2
Total	10	6

Recommended Books

Text

1. **Carlo Ghezzi, Mehdi Jazayeri, Dino Mandrioli**, *Fundamentals Of Software Engineering*, Second Edition. Prentice Hall of India Private Limited. New Delhi. 2002.

References

1. **Rajiv Mall**, *Fundamentals of Software Engineering*, Prentice Hall of India Private Limited, New Delhi, 2000.
2. **Ian Sommerville**, *Software Engineering*, Fifth Edition, Addison-Wesley, An Imprint of Pearson Education, 1995
3. **Roger S Pressman**, *Software Engineering A Practitioner's Approach*, The McGraw Hill Companies, Inc
4. **Elias M Awad**, *System Analysis and Design*, Second Edition, Galgotia Publications Pvt. Ltd, New Delhi.1998

Paper V: Project

Objective

The objective of the project is to consolidate the concepts and practices that were learned during the course and to serve as a *record of competence*. It should enable a student to apply concretely in a small package the concepts gained from Software Engineering.

Outline of the Course

Minimum Hours		Marks					
		External		Internal		Total	
Honors	Pass	Honors	Pass	Honors	Pass	Honors	Pass
180	100	50	40	20	10	70	50

Guidelines

- ***Overview:*** The project will be carried out over a duration of three months, involving minimum 100 hours for General students and minimum 180 hours for Honours students. Every student should do a project individually and not in a group. The selected project can be either of type Model 1 or Model 2 described below.
- ***Platform:*** The project can be in any platform e.g., DOS, WINDOWS, UNIX, LINUX, Mac OS, etc.
- ***Language and package:*** The project can be done using any language or package learned within or outside the course such as C, C++, Java, VS. C#, Director, tcl VC++, Visual FoxPro, Flash, etc.
- ***Venue:*** The project can be done in the College itself or in a reputed organization.
- ***Guides:*** Internal Guides from within the college should be assigned to each student. If the project is to be done in a reputed organization, an External Guide from that organization is also required as Co-Guide, and the qualification of the External Guide should not be less than that of the Internal Guide.
- ***Monitoring of Progress:*** The progress of the project should be monitored through seminars, and each of the seminars should be evaluated, a record of which should be maintained. The number of seminars should not be less than three (e.g. Analysis, Design, Implementation).
- ***Final Examination:*** For the final external evaluation a brief summary of the project should be submitted to the university at least one week prior to the date of the examination for the benefit of the external examiner(s).

Types of Project

Model 1

1. The topic for the project can be any subsystem of a system software or tool or any scientific or a fairly complex algorithmic situation.
2. The aim of this type is to highlight the abilities of algorithmic formulation, program and data flow representation, modular programming or object oriented programming, optimized code preparation, systematic documentation and other associated aspects of software engineering.
3. The assessment would be through the Project Report, Viva and the following criteria for this model:
   - » Programming style, structured design, minimum coupling and high cohesion, abstraction, encapsulation, inheritance and polymorphism, as relevant.
   - » Good commenting and annotating of the code and flow of representation, such that meaningful code, with good readability and ease of maintenance, results.
   - » Design specifications, depicting the method adopted and giving a simple data dictionary for each data, to cover name, type and validity aspects.
   - » Test case samples, enough in number, to adequately cover the possible chances of common errors

Model 2

1. This model can be of a typical business application. The aim of this type is to highlight the stages involved in a typical business oriented project development, though on a miniature scale, in a real or simulated environment. The appropriate use of DBMS/RDB' IS towards any business application, along with adequate system analysis and structured design and development of specific tools/products, would be the underlying activity in preparing this project.

2. The emphasis should be on selecting a system/subsystem that shows the DBMS/ RDBMS and System Analysis aspects to a greater degree. Any small and simple business system may be selected, although candidates are advised to use their knowledge and creativity, to select typical and intelligent applications, rather than run-of-the-mill themes, such as simple Pay roll calculation or Issue-Return portion of an inventory scheme. The Evaluation stage would give due weightage for theme selection, problem analysis, fact finding techniques and initial design, which is as close to real-life business situations as possible

3. The code can be generated out of 4 GL interface, like Screen Builder and Report Generator, Application Generator/Program Code Generators, or can be totally hand-coded or a combination of both. The documentation need not contain the code generated by these applications, but only that written by the candidate

4. The assessment would be through the Project Report, Viva and the following criteria for this model:

   - Requirements leading to the project, those which were the result of System Analysis
   - The design aspect of DBMS/RDBMS oriented documentation which describes the structure and organization of the database, well annotated source code, supplemental documentation, which can serve as Data Analysis and Data Flow description
   - A simple Data Dictionary of the elements which form the structure
   - Details about I/O Screens and facilities for on-screen querying, print oriented Reports and built in house-keeping routines which help disk management and file integrity, are to be included to the extent possible.
   - Details of Acceptance Tests which, should be in adequate number and should include error messages

Content of the Project Report

1. Acknowledgement
2. Certificate, stating it to be a bonafide work of the student, and that it has not been submitted for any other examination, and counter-signed by the project guide(s).
3. Synopsis of the project
4. Description of the existing system
5. Proposed system
6. User requirements
7. Hardware and software requirements
8. Costs and benefits estimation
9. Gantt Chart (Project Control)
10. System Flow Charts, Algorithms
11. DFD Decision Tables, Decision Trees
12. Data Dictionary
13. Module Design
14. Database Design
15. File Description
16. Source Code
17. Input and Output Screen Design
18. Testing used and Test Results
19. Need for review : deficiencies and future enhancements
20. User/Operational Manual (including menu design, security aspects, access rights, backup, controls etc.)

Data Dictionary

1. This should give a catalogue of the data elements used in the system/subsystem developed.
2. The following are the details required. Write NA where NOT applicable
   - » Data Name
   - » Aliases, if any
   - » Length (size)
   - » Type (Numeric, alpha, binary, etc)
   - » Validity criterion (Minimum, maximum, etc)
   - » Default value, if any
   - » Whether related to other data items
   - » Where used in the program: Reference to data structure/file/procedures/modules

User Manual

It may include chapters like the ones suggested below.

- » Installation
- » Hardware requirements
- » System requirements
- » Installation procedure, including security aspects like password, protection, backups, controls, etc
- » Menu choices and their actions - screen formats
- » Error messages
- » Output
- » A Sample test case

Viva-Voce

The viva-voce will be conducted by external examiner(s) appointed by the University and internal examiner(s) from the College. Other members of the faculty and students may be present. It will be of duration of about 15 to 20 minutes. The analysis, design aspects and quality of implementation of the project would be the main subject matter for the viva. However the general proficiency of the candidate in the selected software platform should also be tested.

Distribution of Marks

	Honours	General
Analysis	8	6
Design	7	4
Implementation	15	10
Internal	20	10
Project Report	10	10
Viva	10	10
Total	**70**	**50**

Paper VI: Database Management System

Objective

The objective of this paper is to introduce to the students the fundamental concepts necessary for designing, using and implementing database systems and applications. The paper stresses on database modeling and design, physical file storage techniques and language facilities provided by database management systems. The students are also provided with an overview of some of the emerging database technologies and applications.

The tutorial classes are to be utilized for discussing case studies.

Outline of the Course

Minimum Class Hours			Exam Time (Hours)	Marks		
Class	Tutorial	Total		Theory	Internal	Total
95	25	120	3	90	10	100

Unit	Topic	Minimum Class Hours			Marks
		Theory	Tutorial	Total	
I	Introduction and Conceptual Data Modeling	20	5	25	20
II	Relational Data Model and SQL	20	5	25	20
III	Functional Dependencies and Normalization	10	5	15	10
IV	File Organization	15	5	20	15
V	Query Processing, Transaction Processing Concurrency Control and Security	20	5	25	20
VI	Advanced Database Concepts and Emerging Applications	10	0	10	5
Total		95	25	120	90

Detailed Syllabus

Unit I: Introduction and Conceptual Data modeling **20+5 Hours**

Introduction: Introduction to databases, characteristics of the database approach, database users and designers, role of a DBA, advantages of using a DBMS, data models, schemas, instances, DBMS architecture (Three-Schema Architecture), Database Systems- Network, Hierarchical, Relational, Data Independence

Conceptual Data Modeling: Phases of database design, entity type, entity set, attributes, keys, value sets, relationships, relationship types, relationship sets, relationship instances, relationship degree, role names, recursive relationships, constraints on relationship types, attributes of relationship types, weak entity types, ER Diagram, naming conventions and design issues, EER concepts-specialization, generalization, aggregation, Case study

Unit II: Relational Data Model and Structured Query Language **20+5Hours**

Relational model concepts: Domain, attribute, tuple, relation, characteristics of relations, relational databases, relational database schemas, relational constraints (Domain constraint, constraints on null, entity integrity, referential integrity, foreign keys, ER to Relational mapping algorithm, Case study

Relational Algebra: basic relational algebra operations-SELECT, PROJECT, UNION, INTERSECTION, SET DIFFERENCE, Cartesian PRODUCT, JOIN, Aggregate functions

Relational Calculus: Tuple Relational Calculus, Domain Relational Calculus

SQL: Characteristics of SQL, Data types in SQL, Types of SQL commands

Data Definition Commands: CREATE SCHEMA, CREATE TABLE, DROP TABLE, ALTER TABLE

Single table query commands: SELECT, SELECT with WHERE, SELECT with ORDER BY, SELECT with GROUP BY, SELECT with GROUP BY and HAVING, SQL built-in functions - SUM, MIN, MAX, COUNT, AVG

Multi-table query commands: Retrieval using sub-query, JOIN, EXIST and NOT EXIST

Special operators: IS NULL, IS NOT NULL, BETWEEN..AND, IN, LIKE, ANY, ALL

Data changing commands: INSERT, DELETE, UPDATE

Unit III: Functional Dependencies and Normalization **10+5Hours**

Functional Dependencies, First Normal Form, Second Normal Form, Third Normal Form, Boyce-Codd Normal Form, Multivalued Dependencies, Join Dependencies, Fourth Normal Form, Fifth Normal Form, Denormalization

Unit IV: File Organization **15+5Hours**

Introduction to storage hierarchies, hardware descriptions of disk devices, Magnetic Tape Storage Devices, RAID technology, Organization of file records on disk (record and record types, Fixed- length records, variable-length records, record blocking, spanned and unspanned records, allocating file blocks on disk, file headers), Operations on Files (Open, Reset, Find, Read, Delete, Modify, Insert, Close), primary methods of file organization -Heap Files, Sorted Files, Hashed Files, Types of Single-level Ordered Indexes (Primary Indexes, Clustering Indexes, Secondary Indexes), Multilevel Indexes: Basic technique, Multilevel indexing using B trees and B+ trees,Indexing on multiple keys

Unit V: Query Processing, Transaction Processing, Concurrency Control and Security **20+5Hours**

Query Processing: Overview of query processing, translation of SQL queries into relational algebra

Transaction Processing: Transaction, ACID properties of transaction, transaction states, schedules, serializability, tests for serializability, recoverability, transaction definition in SQL

Concurrency Control: Concurrent execution of transaction, Lock-based techniques for concurrency control-Two-Phase locking protocol and its variations, Graph-based protocol, Timestamp based protocol, Deadlock, Deadlock prevention methods, Deadlock detection, Deadlock recovery

Security: Risks to data security, role of the DBA in maintaining database security, access protection, encryption, database audits

Unit VI: Advanced Database Concepts and Emerging Applications **10 hours**

Introduction to Object-Oriented Databases, Distributed databases: Client-Server Architecture, Data Mining, Data Warehousing, Deductive databases, Databases on the World Wide Web, Multimedia Databases, Geographical Information Systems

Sample Case Studies

Case Study I: DreamHouse Properties

The requirement collection and analysis phase of the database development lifecycle was carried out at a DreamHouse branch. The requirements specification, which describes the information to be held in the DreamHouse database and the transactions required by the supervisor are as follows.

Data Requirements

1. Each branch of DreamHouse has staff who are dedicated to the management of property for rent. The staff works in groups that are supervised by a Supervisor and supported by a Secretary.
2. The information stored on each branch office includes a unique branch number, address (street, area, city, pincode), telephone number and fax number.
3. The information held on all members of staff includes a staff number, name (first and last), address, telephone, sex, date of birth, job title and the number and address of the branch office at which they work. Additional information held on staff with the job title of Secretary is their typing speed. The staff number is unique across all branches of the DreamHouse company.
4. Each Supervisor supervises the day-to-day work of a group of staff(minimum 5 to a maximum of 10 members of staff, at any one time)
5. A portfolio of property for rent is available at each DreamHouse branch. Each property for rent is managed by a particular member of staff. A member of staff may manage a maximum of 10 properties for rent at any one time. The information stored on each property for rent includes : the property number, address(street,area,city,pincode),type,number of rooms,monthly rent, and the name and address of the property owner. The monthly rent for a property is reviewed annually. Most of the property rented out by DreamHouse are flats. Each property is owned by a single owner.
6. The details of owners of property are also stored. There are two main types of property owner: private owner and business owner. The information stored on private owners includes the owner number, name (first, last), address and telephone number. The information stored on business owners includes the owner number,

name of business, business type, address, and telephone number and contact name. Each owner owns at least one property.

7. The staff responsible for the management of property for rent must undertake the following activities

a) To ensure that property is rented out continuously. This may require placing an advertisement describing a property for rent in an appropriate newspaper. The information stored on each advert includes the advert number, the date the advert was placed in the newspaper, the name of the newspaper, the cost, and some details of the property including the property number, type and address. The advert number is unique across all DreamHouse branches. The information stored on each newspaper includes the newspaper name, address, telephone no., fax no, and contact name. Properties are only advertised in the newspapers if they prove difficult to rent.

b) To set up interviews with clients interested in renting property. The information stored as a result of each interview includes the date of the interview and any general comments about the client. During the interview the details of the client are also collected. However, some clients do not attend an interview and simply provide their details by telephone or on their first visit to a DreamHouse branch. The information stored on clients includes the client number, name (first and last), current address, telephone number and some information on the desired property, including the preferred type of accommodation, and the maximum rent the client is prepared to pay. The client number is unique across all DreamHouse branches.

c) To encourage clients to view properties for rent. The information stored includes the client's number, name and telephone no., the property no. and address, the date the client viewed the property and any comments made by the client regarding the suitability, or otherwise, of the property. A client may view the same property only once on a given date.

d) To organize the lease agreement between a client and a property. Once a client agrees to rent a property, a lease agreement is organized by a member of the staff. The information on the lease agreement includes the lease no., the client no. and name, the property no, address, type and no. of rooms, the monthly rent, and method of payment, deposit (calculated as twice the monthly rent), whether the deposit is paid, and the date the rent period starts and finishes,the duration of the lease. The lease no. is unique across all DreamHouse branches. A client may hold a lease agreement associated with a given property for a minimum of three months to a maximum of 1 year.

e) To carry out inspections of property on a regular basis to ensure that the property is correctly maintained. Each property is inspected at least once over a six month period. However, DreamHouse staff only carry out inspections of property that is currently being rented or is available for rent. The information stored on the inspection includes the property number and address, date of the inspection, name of the member staff who carried out the inspection, and any comments on the condition of the property.

Transaction Requirements

The main transactions require by Supervisors include:

a) Produce a list of staff supervised by a Supervisor.
b) Produce a list of staff supported by a Secretary.
c) Produce a list of Supervisors at each branch.
d) Create and maintain records recording the details of property for rent and the owners at each branch.
e) Produce a report listing the details of property (including the rental deposit) at each branch.
f) Produce a list of properties managed by a specific member of staff.
g) Create and maintain records describing the details of clients at each branch.
h) Produce a list of clients registered at each branch.
i) Search for properties that satisfy various criteria.
j) Create and maintain records holding the details of viewings of properties made by clients.
k) Produce a report listing the comments of clients concerning a specific property.
l) Create and maintain records detailing the adverts for a specific property.
m) Produce a list of all adverts for a specificproperty.
n) Produce a list of all adverts place in a specific newspaper.
o) Create and maintain records describing the details of lease agreements between a client and a property.

p) List the details of the lease agreement for a specific property.

q) Create and maintain records describing the details of inspections of properties.

r) Produce a list of all inspections of a specific property.

Case Study II: Asiatic Society Library

The Asiatic Society Library (ASL) has approximately 16,000 members, 100,000 titles and 250,000 volumes. About 17 percent of the volumes are out on loan at any one time. The librarians ensure that the books that members want to borrow are available when the members want to borrow them. Also, the librarians must know how many copies of each book are in the library or out on loan at any given time. A catalog of books is available on-line that lists books by author, title and subject area. For each title in the library, a book checkout card is kept in the catalog that ranges from one card to several pages. The reference librarians want to be able to access this description when members request information about a book. Library staff is divided into chief librarian, departmental associate librarians, reference librarians, check-out staff, and library assistants. Books can be checked out for 21 days. Members are allowed to have only five books at a time. Members usually return books within three to four weeks. Most members know that they have one week of grace before a notice is sent to them, so they try to get the book returned before the grace period ends. About 5 percent of the members have to be sent reminders to return a book. Most overdue books are returned within a month of the due date. Approximately 5 percent of the overdue books are either kept or never returned. The most active members of the library are defined as those who borrow at least ten times during the year. The top 1 percent of membership does 15 percent of the borrowing, and the top 10 percent of membership does 40 percent of the borrowing. About 20 percent of the members are totally inactive in that they are members but do never borrow. To become a member of the library, applicants fill out a form including their SSN, campus and home mailing addresses and phone numbers. The librarians then issue a numbered, machine readable card with the member's photo on it. This card is good for four years. A month before the card expires, a notice is sent to a member for renewal. Professors at the institute are considered automatic members. When a new faculty member joins the institute, his or her information is pulled from the employees' record and a library card is mailed to his or her campus address. Professors are allowed to check out books for three-month intervals and have a two-week grace period. Renewal notices to professors are sent to the campus address. The library does not lend some books, such as reference books, rare books and maps. The librarians must differentiate between books that can be lent and those that cannot be lent. In addition, the librarian have a list of some books they are interested in acquiring but cannot obtain, such as rare or out-of-print books and books that were lost or destroyed but have not been replaced. The librarian must have a system that keeps track of books that cannot be lent as well as books they are interested in acquiring. Some books may have the same title, therefore, the title cannot be used as a means of identification. Every book is identified by its International Standard Book Number (ISBN), a unique international code assigned to all books. Two books having the same title can have different ISBNs if they are in different languages or have different bindings (hard cover or soft cover). Editions of the same book have different ISBNs. The proposed system must be designed to keep track of the members, the books, the catalog, and the borrowing activity.

Instructions to Paper Setter

(The question papers will be set according to the following scheme)

Unit	Questions	
	To be set	To be answered
I	2	1
II	2	1
III	2	1
IV	2	1
V	2	1
VI	2	1

Recommended Books

Text

1. **R.Elmasri, S.B Navathe**. *Fundamentals of Database Systems*, (Third Edition), Tata McGraw Hill Pvt. Ltd. 2000.

Reference

1. **A. Silberschatz, H.F Korth, S Sudarshan**. *Database System Concepts*, Tata McGraw Hill, 1997.
2. **Bipin Desai**. *An Introduction to Database Systems*, Galgotia Publications (West Publishing) 1991.
3. **D.M Kroenke**. *Database Processing: Fundamentals, Design and Implementation*. Prentice-Hall of India, (Eighth Edition) 2002.
4. **G.W Hansen, J.V Hansen**. *Database Management and Design*, Prentice-Hall of India (2nd Edition) 2001.
5. **Thomas M Connolly, Carolyn E Begg**. *Database Systems: A Practical Approach to Design, Implementation and Management*. Addison Wesley Longman Ltd. 1999.
6. **Nilesh Shah**. *Database Systems Using Oracle*, Prentice-Hall of India (1st Edition) 2002.
7. **Konrad King**. *SQL: Tips & Techniques*. Prentice Hall of India. 2002.

Paper VII: Data Communication and Networks

Objectives

Data communication and networks have become an integral part of our lives. This paper intends to give an in depth knowledge about the various layers in the networks, bringing to the fore the various issues involved in the design of these layers, and the various algorithms used to resolve them. The aim also is to highlight the various aspects of data communication. It also introduces the students to the recent areas of computer networking.

Outline of the Course

Minimum Class Hours	Exam Time (Hours)	Marks		
Theory	Theory	Theory	Internal	Total
120	3	90	0	90

Unit	Topic	Minimum Class Hours	Marks
I	Introduction to Computer Networks; Physical Layer	20	15
II	Data Link Layer	20	15
III	Medium Access Control Sublayer	20	15
IV	Network Layer	20	15
V	Transport Layer	20	15
VI	Application Layer, WWW, Network Security	20	15
TOTAL		120	90

Detailed Syllabus

Unit I: Introduction To Computer Networks and Physical Layer **20 Hours**

Introduction to Computer Networks

Uses of Computer Networks; Wired and wireless Networks; Types of networks – LAN, MAN, WAN; Network Topology; OSI Reference Model – Outline, Protocol Hierarchies, Design considerations; TCP/IP Reference Model; Comparison between the two reference models; ATM Reference Model; Examples- Internet, X.25, Frame Relay, ATM, Ethernet, Wireless LANs, ISDN

Physical Layer

Fourier Analysis (Qualitative), Maximum data rate of a Channel, Bit rate and Baud; Baseband and Broadband; Guided Transmission Media- Magnetic, Twisted pair, Coaxial cable, Fibre Optics; Wireless transmission – Electromagnetic Spectrum, Radio transmission, Microwave Transmission, Infrared transmission; Communication Satellite; Frequency Division and Time Division Multiplexing; Circuit, Message and Packet Switching; Hybrid Switching; Outline of PSTN, Mobile Telephone System, Cable Television; Transmission in ATM Networks; ATM Switches.

Unit II: Data Link Layer **20 Hours**

Design Issues - Services provided to the higher layer, Framing, Error Control, Flow Control; Error Detection and Correction – Error Correcting Codes, Error-Detecting Codes; Elementary Data Link Protocols – Unrestricted simplex protocol, Simplex stop-and-wait protocol, Protocols for Noisy Channel; Sliding Window protocols – One bit sliding window, Go Back n protocol, Protocol using Selective Repeat; Examples – HDLC, Data Link Layer in the Internet, PPP.

Unit III: Medium Access Control Sublayer **20 Hours**

Channel Allocation Problem – Static and Dynamic channel allocation; Multiple access – Aloha, Slotted Aloha, CSMA; Collision free protocols; Wireless LAN protocols – MACA, MACAW; IEEE Standard 802.3 – Ethernet, Cabling, Encoding, MAC Sublayer, Switched Ethernet, Fast Ethernet, Gigabit Ethernet; IEEE Standard 802.4 – Physical Layer, MAC Protocol, MAC SubLayer; IEEE Standard 802.5 – Physical layer, MAC Protocol, MAC SubLayer; FDDI – Physical Layer, MAC Sublayer; MAC Frame; IEEE Standard 802.11 – Protocol Stack, Physical Layer, MAC Sublayer, Frame Structure; IEEE Standard 802.16 – Protocol Stack, Physical Layer, MAC Sublayer, Frame Structure; Bluetooth- Architecture, Application, Protocol Stack, Radio Layer, Baseband layer, Frame

Structure, Bridges – Spanning tree bridges, Remote bridges

Unit IV: Network Layer **20 Hours**

Design Issues – Store and forward packet switching, Services provided to higher layer, Connection Oriented and Connectionless services, Virtual Circuits and Datagram subnets, Routing Algorithms – Shortest Path Routing, Flooding, Distance Vector Routing, Link State Routing, Hierarchical Routing, Broadcast Routing, Multicast Routing, Routing for Mobile Hosts, Routing in Ad hoc networks, Congestion Control Algorithms – General Principles, Load shedding, Jitter control, QoS, Leaky Bucket Algorithm, Token Bucket Algorithm, RSVP, Integrated Services – Tunneling, Fragmentation, Internet Protocol – IP addresses, Subnets, IPv6, Mobile IP address translation, Internet Control Protocol – ARP, RARP, BOOTP, DHCP, Mobile IP – Routing

Unit V: Transport Layer **20 Hours**

Design issues, Services presented to the layers, Transport protocols – Addressing, Connection Establishment and Release, Flow Control and Buffering, Multiplexing, Crash Recovery, Simple Transport Protocol

Internet Transport Protocols: UDP – Remote Procedure Call, Real-time transport Protocol, TCP – Service Model, Protocol, Header, Connection Establishment and Release, Connection Management, Transmission Policy, Congestion Control, Wireless TCP and UDP, Performance Issues

Unit VI: Application Layer, World Wide Web and Network Security **20 Hours**

Application Layer

Domain Name System – name space, resource records, name servers, Electronic Mail- architecture and services, user agent, Message formats – MIME, Message Transfer – SMTP, Message Delivery – POP3 and IMAP, Virtual Terminal, Telnet, Ftp

World Wide Web

Architectural Overview, Client Side, Server Side, Uniform Resource Locators – Statelessness and Cookies; Hypertext Transfer Protocol, Wireless Web – Wireless Application Protocol, i-Mode

Network Security

Cryptography, Substitution Ciphers, Transposition Ciphers, One time pads, Quantum Cryptography, Cryptographic principles, Symmetric-Key Algorithms – Data Encryption Standard, Advanced Encryption Standard, Cipher Modes; Public-Key Algorithms – RSA, Digital Signatures – Symmetric-Key, Public-Key, Message Digest, Birthday Attack; Communication Security – IPSec, Firewalls, Virtual Private Networks, Wireless Security – 802.11 Security, Bluetooth Security, WAP Security, Authentication Protocols – Based on shared secret key, Diffie-Hellman Key Exchange, Key Distribution Center, Kerberos, Public Key

Instruction to Paper Setter

(The question papers will be set according to the following scheme)

Unit	Questions	
	To be set	To be answered
I	2	1
II	2	1
III	2	1
IV	2	1
V	2	1
VI	2	1

Recommended Books

Text

1. **Andrew S. Tenenbaum**, *Computer Networks* (Fourth Ed.), Prentice Hall of India, 2002

Reference

1. **William Stallings**, *Data and Computer Communications* (Sixth Ed.), Prentice Hall of India, 2000
2. **U. D. Black**, *Data Communications and Distributed Networks* (3rd Ed.), Prentice Hall of India, 1993
3. **Fred Halsall**, *Data Communication, Computer Networks and Opens Systems*, (4th. Ed.), Pearson Education, 2000
4. **William Stallings**, *Cryptography and Network Security - Principles and Practice*, *Pearson Education, 2000*

Paper VIII (Elective 1): Object Oriented Programming Through C++

Objective

The objective of the course is to provide the basic concepts of object oriented programming using C++.

The course will mainly focus on the following aspects:

- Understanding OOP concepts
- Learning C++ language constructs and writing small programs using them
- Implementing the fundamental tools of OOP: Encapsulation, Inheritance, Polymorphism
- Managing I/O Streams, Console I/O and File I/O operations
- Handling errors, using templates and building class libraries

Outline of the Course

Minimum Class Hours			Exam Time (Hours)			Marks			
Theory	Practical	Total	Theory	Practical		Theory	Practical	Internal	Total
60	60	120	2	3		60	40	10	100

Unit	Topic	Class Hours			Marks
		Theory	Practical	Total	(Theory)
I	Principles of Object Oriented Language, C++ Language Basics	12	12	24	10
II	Classes and Objects, Constructors, Operator Overloading	12	12	24	11
III	Inheritance, Virtual Functions and Polymorphism	12	12	24	10
IV	Stream Classes and File I/O	12	12	24	10
V	Exception Handling, Namespaces, Class libraries, Templates	12	12	24	10
TOTAL		60	60	120	50

Detailed Syllabus

Unit I : Principles of Object Oriented Programming, C++ Language basics **12+12 Hours**

Principles of Object Oriented Programming: Basic concepts of OOP (Abstraction, Encapsulation, Inheritance, Polymorphism), Benefits of OOP, Comparison with procedural programming and OOP, code reusability, creating new data types.

C++ Language basics: tokens and identifiers, character set and symbols, keywords, C++ identifiers, constants, variables, type modifiers, symbolic constants.

Variable declaration, operators, arithmetic, relational, equality, conditional, increment and decrement, assignment, bitwise, sizeof, precedence and associativity of operators, typecasting, manifestation of variables, expressions, statements, declaration of constants, reference variables, type casting.

Structure of a C++ program, comments, header files, *cin* and *cout* << and >> operators, *setw* and *endl*.

Control statements: if, if...else, switch, for, while, do ... while, break, continue, goto.

Storage classes, scope resolution operator, type conversion.

Pointers: the address operator &, pointer variable, declaration, operator *, pointer to void pointers and arrays, pointers and strings, arrays of pointers to strings, memory management using *new* and *delete* operators, pointers to objects, pointers to pointers, this, enum.

Functions (declaration, definition, call), call by value and by reference, return by reference. Arrays as function arguments, inline function, const arguments, macros, inline function versus macros, function overloading, functions with default arguments.

Unit II : Classes [illegible] 12+12 Hours

Classes and Objects [illegible] access specifier, private and public members, member functions [illegible] objects, member access operators, nesting [illegible] (data members and functions). Arrays of objects, [illegible] Friend functions, Pointers to members. Friend classes

Constructors [illegible] overloaded constructors, default constructor, [illegible] objects, destructor

Operator overloading [illegible] as member function and friend function, overloading [illegible] Type conversions (class type to built-in type, built-in type to class, [illegible])

Unit III : Inheritance, [illegible] 12+12 Hours

[illegible] types of inheritance (single, multiple, multilevel, hierarchical, hybrid), Defining derived class, Access specifiers [illegible] accessing base class members, ambiguity in multiple inheritance, [illegible] Derived class constructor with arguments, Initialization [illegible]

Virtual functions and polymorphism [illegible] abstract classes, implementation of virtual functions (virtual pointers and virtual tables in classes with virtual functions), [illegible] pointer, static binding, dynamic binding, virtual functions in derived classes, [illegible] virtual functions and constructors, calling virtual functions from constructors, [illegible] calling virtual functions from destructors, virtual base classes, Rules for virtual functions

Unit IV : Stream classes, File I/O 12+12 Hours

Stream classes : [illegible] width(int n), fill(int n), precision(), precision (int n), [illegible] showpos, unitbuf, stdio, dec, oct, hex, left, right, [illegible] functions, manipulators (skipws, noskipws, dec, oct, hex, left, right, [illegible] noshowbase, showpoint, noshowpoint, scientific, [illegible] setprecision (int n), setbase (base n), setiosflags [illegible] user-defined manipulators, istream (get(ch), get(str, MAX), get(str, DELIM), [illegible] putback(ch), peek(ch), gcount(), ignore(MAX, DELIM) [illegible] ostream classes, _withassign classes, streambuf class, Predefined stream objects [illegible] operators

File I/O [illegible] in, out, ate, app, trunc, nocreate, noreplace, binary), character I/O, [illegible] Binary I/O, Database management (appending, listing, [illegible])

Sending [illegible]

Unit V : Exception handling, [illegible], Class Libraries, Templates 12+12 Hours

Exception handling : exception class [illegible] exceptions with arguments, Handling every exception, built-in exception class, [illegible]

Namespaces : referencing [illegible] within a namespace (scope resolution and using keyword), smart pointers, iterators, containers, [illegible] pointer to a function, explicit keyword, mutable keyword.

Existing Class Libraries for common data structures: *String class* (creation, concatenating, comparing, extracting and deleting given number of characters, replacing specified number of characters with a given string, changing case), *Stack class* (push, pop, pop and display, empty, display item at the top), *singly linked list* (create, insert, delete, traverse, search), and queue classes (create, insert, delete, [illegible] empty, [illegible]), *Date class* (checking leap year, displaying calendar, adding days to a date, subtracting days from a date, calculating days between 2 dates).

Templates : Function Templates, example of function template implementation (quick sort for any data type), Overriding function templates, Function Templates with multiple arguments, Class Template, example of class template implementation (general purpose linked list), Templates versus Macros

Practical Assignments

(Questions need not be restricted to this list)

1. Define a class to represent a bank account. Include the following members:

   a) *Data members*
      i) Name of the depositor
      ii) Account number
      iii) Balance amount in the account
   b) *Constructor function*
      i) To initialize members with values obtained at run-time
   c) *Member functions*
      i) To deposit an amount (minimum = $ 500)
      ii) To withdraw an amount after checking the balance to ensure that withdrawal is possible (minimum 500 must remain in the account)
      iii) To display name and balance

   Write a *main()* function to test the program. It should create an account. It should then present a menu with options (1) Display (2) Deposit (3) Withdraw (4) Exit and allow the user to do as many transactions as required till the user decides to exit.

2. Define a class called *employee* that contains a *name* (an array of *char*) and an employee number (type *long*). Include a member function called *getdata()* to get data from the user to initialize the object's members, and another function called *putdata()* to display the data. Assume the *name* has no embedded blanks.

   Write a *main()* program to test this class. It should create an array (maximum size 100) of type *employee*, and then invite the user to input data for *n* employees (*n* to be determined at run time). Finally, it should print out the data for the *n* employees.

3. Create a class called *time* that has separate *int* member data for hours, minutes and seconds. The constructor should initialize this data to 0. Include a member function called *getdata()* to get data from the user to initialize the object's members, and another function called *putdata()* to display the data. The final member function *sum()* should add two objects of type *time* passed as arguments.

   Write a *main()* program to test this class. It should create three objects of *time*, get input for the first two objects and then initialise the third using *sum* function. It should then display all the three objects in 11.59.59 format. The program ends only when the user decides to stop.

4. Define two classes called *rupee* (data members : rupee and paise) and *pound* (data members : pound and shilling) and necessary member functions to initialise the data members and display their values. Write a program to convert rupees to pounds and vice versa using overloaded function *convert()*. The main program should present a menu with option (1) Convert Rupees to Pounds (2) Convert Pounds to Rupees (3) Exit. The exchange rate is to be decided at run-time. (1 pound = 20 shillings)

5. Create two classes *british* and *metric* with data members feet and inches and metres and centimetres respectively. Write constructor functions that will initialize their objects with 0 values. Write *getdata()* functions to initialise the data members at run time. Write *input* functions that will receive an object of one type and return an object of the other. Write member functions that will add together two objects of their class. Write a *putdata()* function that will display the value of an object.

   Now write a *main()* function that will receive input for two distances in the unit of the user's choice (both distances may be in any unit) and add the two distances and store it in a unit chosen again. Finally, display the result of the addition. Getting input, adding the distances and displaying the result must go on as long as the user wants.

   (Hint : Create 3 objects for each class. Whatever be the unit in which the first distance is input, convert it into the corresponding first object of the other type. Do the same with the second distance. To add and display the result, call the member functions of the class in which the result is required.)

6. A bookshop maintains an inventory of books being sold at the shop. The list includes details such as author, title, price, publisher and stock position. Whenever a customer wants a book, the sales person inputs the title and author and the system displays the book details and requests for the number of copies required. If the requested copies are available, the total cost of the requested copies is displayed; otherwise, the message "Requested copies not in stock" is displayed.

Design a system using a class called *books* with suitable member functions and constructors. Use *new* operator in constructors to allocate memory space required. Write the necessary destructor.

Write a menu driven program to (a) Add New books (b) Add to stock of existing books (c) Sell books to a customer (d) Exit.

7. *Create* a class called *sqmatrix* with the following members:

   Data members:

   size (to store the rows/columns)

   a pointer (for dynamic memory allocation)

   Member functions

   Parameterised dynamic *constructor* to create an instance of matrix

   getdata() to input matrix elements,

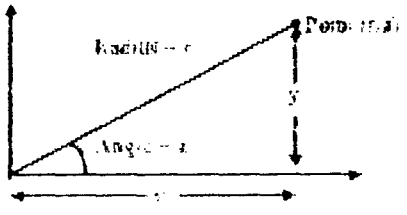
   determinant() to find the value of its determinant

   destructor to free dynamically allocated memory

   Write a *main()* program to test this class. It should create a matrix, get input for its elements (matrix format) and compute its determinant.

8. Write a program to verify the distributive law of matrix multiplication, i.e. if A, B and C are matrices verify that A*(B+C) = A*B + A*C. Write separate functions for inputting and displaying a matrix, adding and multiplying matrices.

9. Design a class *Polar* which describes a point in the plane using polar coordinates *radius* and *angle*. A point in polar coordinates is shown below.



   Use the overloaded '+' operator to add two objects of *Polar*.

   (**Note:** Polar coordinates cannot be directly added. This requires the conversion of points into rectangular co-ordinates, then adding the corresponding rectangular co-ordinates and finally converting the result back into polar co-ordinates. The following trigonometrical formulae may be used: **x = r * cos(a); y = r * sin(a);**

   a = atan(y/x); r = sqrt(x * x + y * y);

10. Define a class string that could work as a user-defined data type. Include dynamic constructors that will create un-initialized strings as well as a string with a string constant at the time of creation (i.e. string s1, s2("Well done");) and destructors to free memory dynamically allocated. Include member functions to display an object and functions to overload the operators

    '+' to add together two string objects

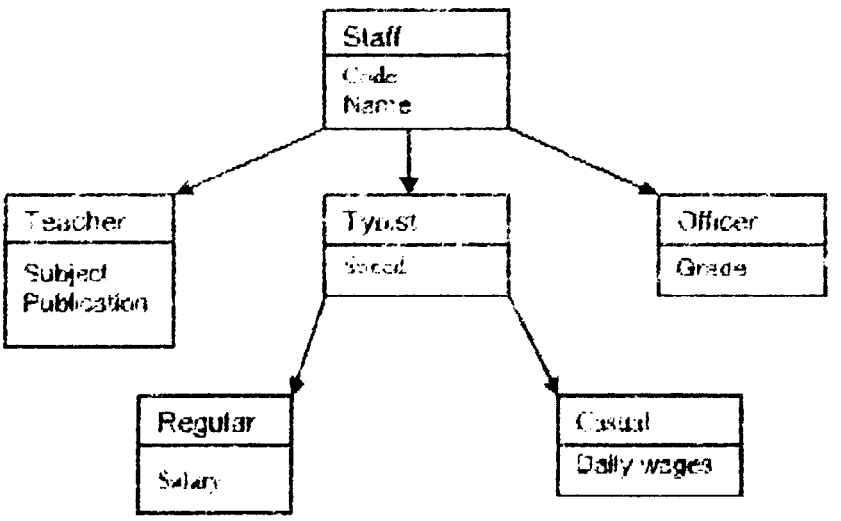
    e.g. s3 = s1 + s2;

    '>' to test whether one string comes after another in the ASCII order

    e.g. to evaluate expression s1 > s2

    Write a main program to test this class.

11. An educational institution has organised its employee information system into a hierarchy of classes as shown below:



Use hierarchical inheritance to define these classes, with appropriate *getdata()* and *putdata()* member functions to get input for the data members of these classes.

Write a program to create an object each for teacher, officer, regular typist and casual typist. Next get input for the data members of these objects and then finally display these values.

12. Create a base class called *shape*. Use this class to store two *double* type values that could be used to compute the area of figures. Derive two specific classes called *triangle* and *rectangle* from the base *shape*. Add to the base class, a member function *getdata()* to initialise base class data members and another member function to *displayarea()* to compute and display the area of figures. Make *displayarea()* as a virtual function and redefine this function in the derived classes to suit their requirements.

Using these three classes, design a program that will accept dimension of a triangle or a rectangle interactively and display the area. Remember, the two values given as input will be treated as lengths of two sides in the case of rectangles, and as base and height in the case of triangles, and used as follows:

Area of rectangle = x * y

Area of triangle = ½ * x * y

13. Extend the above program to display the area of circles. This requires addition of a new derived class *circle* that computes the area of a circle. Remember, for a circle we need only one value, its radius. But the *getdata()* function in the base class requires two values to be passed. [Hint: Make the second argument of *getdata()* function as a default one with zero value.]

14. Run the above program with the following modifications:

a) Remove the definition of *displayarea()* from one of the derived classes.

b) In addition to the above change, declare the *displayarea()* as *virtual* in the base class *shape*.

Comment on the output in each case.

15. Write a program to read a list containing item name, item code and cost interactively and produce a three-column output as shown below:

NAME	CODE	COST
Turbo C++	1001	250.95
C Primer	905	95.75
.		...
.		...

(Note that the name is left-justified, class is right-justified and cost is right-justified with a precision of two digits. Trailing zeros are shown)

16. Modify the above program to fill the unused spaces with hyphens.

17. Write a menu-driven program to

a) Create a file consisting of student records. Each record contains the following details: Name of the student, Roll Number, Marks in Maths, Physics and Computer Science. (Ensure that roll numbers are unique whether entered from the keyboard or generated by the program. Marks should be in the range 0 to 100 only. Include error messages if file cannot be created or opened)

b) Display the result of all students in descending order of grand total

c) Display the result of a student, given the roll number, in the following format:

Name : ..... Roll Number : .....

Subject	Marks Obtained
Maths :	..
Physics :	..
Computer Science:	..

Result : ..... Division : .....

Result is "Passed" for a minimum of 33 marks in each subject, else is "Failed".
Division (given only to those who passed) is
First : 60% and above
Second : 45% and above but less than 60%
Third : less than 45%

Print an error message if a requested roll number is not available in the file.
Write a main() program to test this class.

18. A hospital keeps a file of blood donors in which each record has the format:

Name : 25 Columns
Address : 40 Columns
Age : 2 Columns
Blood Type : 1 Column (Type 1, 2, 3 or 4)

Write a menu-driven program that will have the following options:

1. Append New Records
2. Print a list of all blood donors whose age is above 60 and blood type is 3.
3. Exit

19. Using command line arguments, write a C program for the following task:

Reset the content of a given input file. Assume that the input file contains only upper case letters and/or special characters. Transfer each character from input file to the specified output file according to the following transfer rules:

Rule-1:Alphabet character has to be replaced by its next lower alphabet character in cyclic order. For example, 'A' will be replaced by 'b', 'B' will be replaced by 'c', .., 'Z' will be replaced by 'a'.
Rule-2: Replace space/blank character with '$'
Rule-3: Other characters remain unchanged.
For example:
Input : THE PRICE OF THIS ITEM IS $100.
Output : uif$qsjdf$pg$uijt$jufnjt100.
NOTE: Create your own input file to test the program. Do error checking if wrong number of arguments are specified, or if the file does not exist or cannot be created.

20. Write a program with the following:

a. A function to read two double type numbers from the keyboard

a) A function to calculate the division of these two numbers

b) A *try* block to *throw* an exception when a wrong type of data is keyed in

c) A *try* block to detect and *throw* an exception if the condition *divide-by-zero* occurs

d) Appropriate *catch* blocks to handle the exceptions thrown

21. Build a class for string manipulation (creation, concatenating, comparing, extracting and deleting given number of characters, modifying specified number of characters with a given string, changing case). Use this class in a menu driven program that allows all the listed tasks.

22. Build a class for stack manipulation (create a set of relevant methods like pushing on to stack, checking if stack is empty, popping from the stack, popping and displaying the deleted item, displaying the item at the top. Use this in a sample program for managing a stack of books.

23. Build a class for list manipulation (methods: create, insert, delete, traverse, search). Use this class in a menu-driven program that allows all the listed tasks.

24. Build a class for date manipulation (methods: checking leap year, displaying calendar, adding days to a date, subtracting days from a date, calculating days between 2 days). Use this class in a menu-driven program that allows all the listed tasks.

25. Write a class template to represent a generic vector. Include member functions to perform the following tasks:

a) To create the vector

b) To modify the value of a given element

c) To multiply by a scalar value

d) To display the vector in the form (10, 20, 30, ...)

Instruction For Paper Setter

(The question papers will be set according to the following scheme)

Unit	Theory Questions		Practical Questions		
	To be set	To be answered	To be set	To be answered	Marks
I	2	1	2	1	15
II	2	1			
III	2	1	2	1	15
IV	2	1	2	1	15
V	2	1			

Distribution of marks for practical

10% : Syntax and Input/Output screens

30% : Logic and efficiency (source code, pseudocode, algorithm)

20% : Error trapping (illegal or invalid input, stack overflow, underflow, insufficient physical memory etc)

20% : Completion

20% : Result

Recommended Books

Text

1. **Yashwant P Kanetkar**, *Let us C++*, BPB Publications, 1999

Reference

1. **E Balagurusamy**, *Object Oriented Programming with C++*, Second Edition, Tata McGraw-Hill, 2001
2. **R. Lafore**, *Object Oriented Programming in C++*, Fourth Edition, 2001, Techmedia.
3. **Nabajyoti Barkakoty**, *Object Oriented Programming in C++*, Prentice Hall of India, 2001
4. **B. Stroustrup**, *The Elements of C++ Programming*, Third Edition, Addison Wesley, 2000
5. **S. B. Lippman**, *C++ Primer*, Third Edition, Addison Wesley, 1998
6. **W. Savitch**, *Problem Solving with C++*, Second Edition, Pearson Education, 1999

Paper VIII (Elective 2): Object Oriented Programming Through Java

Objective

The course is designed to impart knowledge and skill required to solve the real world problem using object-oriented approach utilizing Java language constructs. This course covers the two main part of Java i.e. Java Language and Java Library.

After completion of the course students is expected to understand the following-

- Java tokens for creating expressions and creating Datatypes.
- The way various expressions and data types are assembled in packages.
- Implementation of Inheritance, Exception handling and Multithreading in Java.
- Java IO basics and Applets.
- Setting up GUI using AWT/Swing.
- Network Programming in Java.
- Accessing relational databases from Java program.
- Java Beans and Servlet.

Outline of the Course

Minimum Class Hours			Exam Time (Hours)		Marks			
Theory	Practical	Total	Theory	Practical	Theory	Practical	Internal	Total
60	60	120	2	3	50	40	10	100

Unit	Topic	Minimum Class Hours			Marks
		Theory	Practical	Total	Theory
I	Introduction to Java Programming, Classes and Methods	12	12	24	10
II	Inheritance, Exception handling, Multithread and Applets	12	12	24	10
III	String handling, Utility classes , java.lang & java.io	12	12	24	10
IV	Networking, Images, Applet class and Swing	12	12	24	10
V	Java Beans, JDBC, Java Servlets	12	12	24	10
Total		60	60	120	50

Detailed Syllabus

Unit I: Introduction to Java Programming, Classes and Methods 24 Hours *Introduction to Java:* Genesis and Overview, Java & Internet, Object-Oriented Programming features (Encapsulation, Inheritance and Polymorphism). Difference between Java Script and Java, Java and C++, Java as plat and Application, Java Environment and Java Development Kit (JDK) & Java Standard Library (JSL), Java Virtual Machine (JVM), The Bytecodes, Compile & run a simple program.

Constant, Variable, Data types & Arrays: Java Token & Keywords, Integer types, Floating point types, Integer literal, Character literal, Boolean literal, String literal. The *Java class libraries*, declaring a variable, Dynamic initialization, The scope and lifetime of variable, Type conversion and casting, Automatic type promotion in expression, Arrays (One-dimension, Multidimension), Alternative array declaration syntax.

Operators and Expression: Arithmetic operations (The Bitwise, Relational, Boolean, The assignment, Conditional Operator precedence).

Control statement: Decision making and Branching (*if*, Nested *if*, *if-else-if* ladder, *switch*, Nested *switch*, The ?: operator), Decision making and Looping (*while*, *do-while*, *for*), Jump (*break*, *continue* and *return*).

Introduction to classes, methods and objects: The general form of a class, declaring objects, Assigning object reference variable, Introducing methods (Adding methods to a class, returning a value, Adding methods that takes parameters), Constructors, Parameterized constructor, The *this* keyword, Inside variable hiding, Garbage

collection, the finalize() method. A stack class-an example, Overloading constructor, Using object as parameters, Argument passing, Returning objects, Recursion, Introducing Access control (public, private and protected), *static*, *final*, nested classes, String class, Command-line argument

Unit II: Inheritance, Exception handling, Multithread and Applets **12+12 Hours**

Inheritance: Extending a class, Basics of inheritance, Member access and inheritance, using super class, creating a multilevel hierarchy, method overriding, dynamic method dispatch, using abstract classes, using *final* with inheritance, the object class

Packages and Interface: Packages (Defining a package, classpath, and importing packages), Interfaces (Defining, implementing, Applying, Variable in interface)

Exception handling: Exception handling fundamentals, Exception types (uncaught exceptions, using *try* and *catch*, Nested *try* statement, multiple *catch* clauses, *throw*, *throws* and *finally*, Java's built-in exceptions, user defined throwable, user defined exception subclasses, using *Exception*

Multithreaded Programming: The Java thread model (thread priorities, synchronization and inter-thread communication), The main thread, Creating a thread, isAlive( ), join( ), suspend( ) and resume( ), Deadlock

I/O, Applet and Other topics: I/O Basics(Streams, The stream classes, The predefined streams, Reading console input, writing console output, Reading and writing files), Applet fundamentals, The transient and volatile modifiers, using instance of native methods, AWT(Abstract Window Toolkit) Basics

Unit III: String handling, Utility classes, java.lang and java.io **24 Hours**

String handling: The string constructor, special string operations, character extraction, string searching & comparison, data conversion using *valueof* (), string buffer

Exploring java.lang: Simple type wrappers, runtime memory management, Array copy (object clone() and the cloneable interface, class & class loaders), Math functions (transcendental, exponential, rounding), Miscellaneous math methods, Compiler, Thread, threadGroup and runnable, Throwable, Security manager

The utility classes: The enumeration interface, vector & stack, Dictionary, Hash-table, String tokenizer, *Bitset*, *Date*, Date comparison, String and time zones, Random, Observer interface

Input/Output-Exploring java.io: The java.io classes and interface, File Namefilter & Directories, I/O stream classes (File input, File output, Byte array input, Byte array output, Filtered Buffered streams (Buffered input, Buffered output, Push back input, Sequence input), Print stream, Random Access File

Unit IV: Networking, Images, Applet class and Swing **12+12 Hours**

Networking: Socket overview, reserved sockets, Proxy servers, Internet addressing, Domain naming services (DNS), Java and the net, The networking classes and interfaces, Inet address, Factory methods, Introspection, TCP/IP server sockets, Datagrams (Datagram packet, Datagram server and client)

Images: File formats, Images fundamentals, creating, loading and playing, image observer, Double buffering, Media Tracker, *The applet class*: The applet class, applet architecture, applet skeleton (initialization and termination, overriding update(), requesting repaint(), status window, HTML applet tag, passing parameters to applets, getDocumentBase( ) and getCodeBase( ), AppletContext and showDocument(), The audioclip & appletstub interface, Handling events, The event class, processing mouse events, handling keyboard events, outputting to the console

Swing: Swing & its features, text fields, buttons, toggle buttons, check boxes and radio buttons, viewports, scrolling, sliders and lists, combo boxes, progress bars, tooltips, separators and choosers, layered panes, tabbed panes, split panes, and layouts, menus and toolbars, windows, desktop panes, inner frames, and dialog boxes, tables and trees, text Components

Unit V: Java Beans, JDBC, Java Servlets **12+12 Hours**

Java Beans: Introducing to SDK (Bean Development Kit), Advantages of Java Beans, Java Beans API (Application Program Interface), Developing a simple Beans

Java database connectivity (JDBC): Introduction to JDBC, Type of JDBC connectivity, Accessing relational database from Java programs, Establishing database connections

Java Servlets: Background, the life cycle of a servlet, The Java Servlet Development Kit (JSDK), creating and compiling a simple servlet source code, start the servletrunner utility, start a web browser and request the servlet, the servlet API, The javax.servlet packages interfaces (servletConfig, servletContext, servletRequest, servletResponse, singleThreadModel), the GenericServlet class, the servletInputstream class, the

servletOutputstream class, the servletException class, the unavailableException class). Introduction to the javax.servlet.http package. Handling HTTP requests and Response, HTTP GET & HTTP POST

Practical Assignments

(Questions need not be restricted to this list)

1. Write a program to create a class called Box with a parameterized constructor along with a method to calculate the volume of the box. Use the class to find the volume of two boxes whose height, width and depth are 10,20,30 and 20,30,40 respectively.
2. Define a class called stack that can hold 10 integer values, then initialize top of the stack with push and pop methods. Write a program to push the elements into the stack and pop out from the stack.
3. Write a Java program using a class to multiply two matrixes of 3*3 order. Allow the user to input the values through the keyboard.
4. Write a program to multiply two numbers using a method in a class and pass the values using call by value (pass by value and pass by reference) techniques.
5. Write a Java program to find factorial of positive integer using recursion.
6. Write a Java program to accept the command line arguments and display the arguments along with the positions.
7. Write a Java program to demonstrate method overriding where the program creates a superclass called figure that stores the dimensions of various two-dimensional objects. It also defines a method called area() that computes the area of an object. The program derives two subclasses from figure. The first is Rectangle and the second is Triangle. Each of these subclass overrides area() so that it returns the area of a rectangle and a triangle respectively.
8. Write a Java program to create a thread and start running it using runnable interface. Allow the thread to display a message five times with a gap of 500ms.
9. Write a Java program to demonstrate the synchronization of two threads using the synchronized statement.
10. Write a Java program to demonstrate interthread communication considering the producer and consumer problem. There must be two classes, one for producer to produce data and another is consumer to consume data (Hint: Use wait() and notify() to signal in both directions).
11. Write a Java program to copy the content of one file to another using java.io.
12. Write an applet program to accept a message from the keyboard and then to display it on the console.
13. Write an applet to find the biggest of three numbers from the keyboard and display it on the console.
14. An organization has a record of its employees in the form of a list containing the names of employees, their date of birth, date of joining the organization and all the designation that an employee has gone through during the tenure in the office. Write a Java program to create and maintain such a list. The list should be implemented as a vector since the number of employees is likely to grow over the years.
15. Add the following functionalities to the program written in exercise 14
    i. List all employees whose tenure in the office has been for more than 20 years
    ii. The organization has renamed the designation 'Supervisor' as 'Manager'. Write a program to do this conversion automatically in the entire list.
16. Design a Calculator System using Java. The applet should have all the digit buttons along with buttons for operations +,-,*,/ and =. There is a designated panel to show the current results. If a digital button is clicked, the number is displayed on the panel. If an operator button is clicked the operation is to be performed. You may assume the expression to be infix. The calculator can operate in two modes.
    i. When the operator buttons are pressed the intermediate results should be displayed.
    ii. The operations can take in any number of arguments and the final result is displayed only when the = button is pressed. (Hint: Use Overloading).
17. Write a program to input integers into an array and sort them using methods. Display the sorted numbers.
18. Write a Java program that can be used to draw 2-D figures when their relevant dimensions are read in. For example, a circle can be drawn when the center and the radius are read in, and ellipse can be drawn when the major and minor axis lengths along with the center is given, a rectangle can be drawn with two sides given and so on. The program should be able to draw a circle, ellipse, square, rectangle, parallelogram and

a rhombus. Declare 2-D figure as a base class with methods like readparameters () and draw() and use inheritance to write this program efficiently.

19. Add a color chooser to the drawing system so that the user can fill the 2-D figure with any color of user's choice.

20. Write a socket based Java application program to create a connection between two machines such that whatever text one machine is sending to the other will be displayed at the latter's screen and vice-versa.

21. Create a Java application in which a particular machine is configured as the time server which continually listens for requests for time from clients. Clients request the server for time as a result of which the server sends the current time of the clients. The clients make a correction of the received time by adding a very small positive constant to the value and display the corrected time.

22. Create an editor applet in Java using which the users can enter some text and set the font and color of the text according to their choice. The text will be displayed appropriately when the applet is run.

23. Develop a simple Bean and connect it to other components via the BDK. The component called colorBean appears either as a rectangle or ellipse that is filled with a color. A color is chosen at random when the Bean begins execution. A public method can be invoked to change it. Each time the mouse is clicked on the Bean, another random color is chosen. This can be one Boolean read/write properties that determine the shape.

24. Develop an applet using swing to display four push buttons and a text field. Each button displays an icon that represents the flag of a country. When a button is pressed, the name of the country is displayed in the text field. The applet begins by getting its content pane and setting the layout manager of that pane. Next, the applet is registered to receive action events that are generated by the buttons. A text filed is then created and added to the applet. Finally, a handle for action event displays the command string that is associated with the button. The text field is used to present this string.

25. Create an applet using swing that displays four check boxes and a text field. When a check box is pressed, its text is displayed in the text field. The content pane for the JApplet object is obtained, and a flow layout is assigned as its layout manager. Next, four check boxes are added to the content pane, and icons are assigned for the normal, roll over and selected status. The applet is then registered to receive item events. Finally, a text field is added to the content pane.

26. Create an applet using swing that displays four radio buttons and one text field. When a radio button is selected, its text should be displayed in the text field.

27. Create an applet using swing to display a tabbed pane. The first tab is titled "Cities" and contains four buttons. Each button displays the name of a city. The second tab is titled "Color" and contains three check boxes. Each check box displays the name of a color. The third tab is titled "Flavors" and contains one combo box. This enables the user to select one of three flavors.

28. Create an applet using swing to demonstrate a scroll pane. First, the content pane of the JApplet object is obtained and a border layout is assigned as its layout manager. Next a JPanel object is create and four hundred buttons are added to it, arranged into twenty columns. The panel is then added to a scroll pane, and the scroll pane is added to the content pane. This causes vertical and horizontal scroll bars to appear. You can use the scroll bars to scroll the button into view.

29. Designed an applet using swing to create a tree and recognize mouse clicks on it. The init() method gets the content pane for the applet. A DefaultMutableTreeNode object labeled "Options" is created. This is the top node of the tree hierarchy. Additional tree nodes are then created, and add() method is called to connect these nodes to the tree. A reference to the top node in the tree is provided as the argument to the JTree constructor. The tree is then provided as the argument to the JScrollPane constructor. The scroll pane is then added to the applet. Information about mouse click events is presented in this text field.

30. Create an applet using swing to create and use a table. The content pane of the JApplet object is obtained and a border layout is assigned as its layout manager. A one-dimensional array of strings is created for the column headings. This table has three columns. A two-dimensional array of strings is created for the table cells. You can see that each element in the array is an array of three strings. These arrays are passed to the JTable constructor. The table is added to a scroll pane and then the scroll pane is added to the content pane.

31. Develop a servlet allowing you to read the names and values of parameters that are included in a client request using ServletRequest class. Develop the web page corresponding to the servlet.

32. Develop a Servlet that reads some initialization parameters (viz. country and city). The servlet contains two files: servlet.properties and InitServlet.Java, the file servlet.properties defined two properties for a servlet: servlet.name.code, which enable you to associate a name with the class that contains the code for the

servlet and servlet.name.initargs, which enables you to define a sequence of comma-delimited parameter names and values. For both properties, name is a string by which this servlet is to be known.

33. Develop a servlet that handles an HTTP GET request. The servlet is invoked when a form on a web page is submitted. The HTML web page defines a form that contains a select elements and a submit buttons. The select element name is color and the options are Red, Green and Blue. The servlet responses according to the option submitted and display the message "you have selected color"

34. Develop a servlet that handles an HTTP POST request. The servlet is invoked when a form on a web page is submitted. (Hint: The HTML source code is same as the above problem. Except that the method parameter for the form tag explicitly specifies that the POST method should be used and the action parameter for the form tag specifies a different servlet).

35. Develop a simple servlet that loads and displays a single image

36. Develop an applet that loads a seven image slide show and displays a bar chart of the loading progress.

37. Create an applet that create 16 images taken from a single image. The tiles are then scrambled by swapping a random pair from the 16 images 32 times.

38. Write a Java program that prints the addresses and names of the local machine and two well known explored Internet web sites.

39. Create a URL connection using the openConnection() method of a URL object and then use it to examine the documents properties and content.

40. Implement a simple networked communications clients and server. Message are typed into the window at the server and written across the network to the client side, then they are displayed to demonstrate datagrams

Instruction For Paper Setter

(The question papers will be set according to the following scheme)

Theory Questions			Practical Questions		
Unit	To be set	To be Answered	To be set	To be Answered	Marks
I	2	1	2	1	10
II	2	1			
III	2	1	3	2	25
IV	2	1			
V	2	1			

Distribution of marks for practical

10% : Syntax and Input/Output screens
30% : Logic and efficiency (source code, pseudocode, algorithm)
20% : Error trapping (illegal or invalid input, stack overflow, underflow, insufficient physical memory, etc)
20% : Completion
20% : Result

ReCommended Books

Text

1. **Patrick Naughton & Herbert Schildt**, *The Complete Reference Java 2*, (Fourth Edition), Tata McGraw Hill Pvt. Ltd, 2000.
2. **Joseph L. Weber**, *Special Edition Using JAVA 2 Platform*, Prentice Hall India Ltd.

References

1. **Karl Moss**, *Java Servlets*, (Second Edition), Tata McGraw Hill Pvt. Ltd., 2000
2. **E Balagurusamy**, *Programming with Java A Primer*, (Second Edition) Tata McGraw Hill Pvt. Ltd., 2003
3. **D. Hanagan**, *Java Examples in a Nutshell*, (Third Edition) O'Reilly, 2001.
4. **Y Daniel Liang**, *An Introduction to Java Programming*, Prentice Hall of India, 2002

Paper IX: Operating Systems and Introduction to Linux

Objective

The main objective of this paper is to introduce the students to a layer of software called the Operating System, whose job is to manage all the devices of a computer system and provide user programs with a simple interface to the hardware. This paper will familiarize the students with the concepts of processes, memory management, file management, Input/Output management and the potential problem of deadlocks. The students will also learn about the Linux operating system, which is a full-blown Unix clone and is fast gaining popularity worldwide.

N.B. Adequate Linux practical classes should be conducted and the same be evaluated as part of internal assessment. However there will be no external examination for Linux practical

Outline of the Course

Minimum Class Hours	Exam Time (Hours)	Marks		
		External	Internal	Total
120	3	70	10	80

Unit	Topic	Minimum Class Hours	Marks
I	Concepts & Processes	18	10
II	Memory Management	24	15
III	File Systems	18	10
IV	Input/Output	18	10
V	Deadlocks	18	10
VI	Introduction To Linux	24	15
Total		120	70

Detailed Syllabus

Unit I: Concepts & Processes **18 hours**

Operating system objectives and functions, Operating system concepts (Files, Deadlocks, Memory Management, Input/Output, Processes, System Calls, The Shell, Security), The evolution of Operating Systems (Serial Processing, Simple Batch Systems, Multiprogrammed Batch Systems, Time Sharing Systems, Real Time Systems), Introduction to Processes (The Process Model, Process Creation, Process Termination, Process Hierarchies, Process States, Implementation of Processes, Process Control Block), Interprocess Communication (Race conditions, Critical Sections, Mutual Exclusion with Busy Waiting, Sleep and wakeup, Semaphores, Event Counters, Monitors, Message Passing), Classical IPC problems (The Dining Philosophers Problem, The Sleeping Barber Problem), Process Scheduling (Round Robin Scheduling, Priority Scheduling, Multiple Queues, Shortest Job First, Two level Scheduling)

Unit II: Memory Management **24 hours**

Memory management without swapping or paging (Monoprogramming without swapping or paging, Multiprogramming and memory usage, Multiprogramming with fixed partitions), Swapping (Multiprogramming with variable partitions, Memory management with linked lists, Memory management with the Buddy system), Virtual Memory (Paging, Page Tables), Page Replacement Algorithms (Not-recently-used, First in first out, Second Chance page replacement algorithm, Least Recently used page replacement algorithm), Modeling Paging Algorithms (Belady's Anomaly, Stack Algorithms, Predicting page fault rates), Design issues for Paging Systems (The Working Set model, Page size, Implementation issues), Segmentation (Implementation of pure segmentation, Segmentation with Paging: MULTICS)

Unit III: File Systems **18 hours**

Files (File Naming, File structure, File types, File access, File attributes, File operations, Memory mapped files), Directories (Hierarchical directory systems, Path names, Directory operations, Implementing directories, Shared files, Disk space management, File system reliability, File system performance), Security (The security environment, Generic Security Attacks, Design Principles For Security, User Authentication), Protection mechanisms (Protection Domains, Access Control Lists, Capabilities, Protection Models, Covert Channels), Type of File Systems (FAT, VFAT, FAT32, NTFS)

Unit IV: Input/Output **18 hours**

Principles of I/O hardware (I/O devices, Device Controllers, Direct memory access), Principles of I/O software (Goal of the I/O software, Interrupt handlers, Device Drivers, Device-independent I/O software, User-space I/O software), Disks (Disk hardware, disk arm scheduling algorithms, Error handling, Track-at-a-time caching, RAM disks) Clocks (Clock hardware, Clock software), Terminals (Terminal hardware, Input software, Output software)

Unit V: Deadlocks **18 hours**

Resources, Deadlock (Conditions for Deadlock, Deadlock modeling) Deadlock detection and recovery (Deadlock detection with one resource of each type, deadlock detection when there are multiple resources of each type, Recovery from Deadlock), Deadlock avoidance (Resource trajectories, Safe and unsafe states, the Banker's algorithm for a single resource), Deadlock prevention (attacking the mutual exclusion condition, attacking the hold and wait condition, attacking the no-preemption condition, attacking the circular-wait condition) other issues (two-phase locking, non-resource deadlock, starvation)

Unit VI: Introduction to Linux **24 hours**

General overview of the system (Unix and its clones, System Architecture, User Perspective, file system, operating system services, Interrupts and signals), Unix Philosophy (Simplicity, Reusable components, Filters, Flexibility, Open source code and freeware, Multitasking and Multiuser capability, Security, Internet tools, X Window GUI), Shell (Introduction, Bourne Shell, C Shell, Korn Shell, GNU Bourne Again Shell), Kernel (Introduction, Block diagram of system kernel, Kernel data structure, System administration) File System (Types of file, Filename, parent-child relationship, absolute and relative pathname, file and directory permissions) Introduction to vi editor (start vi, the three modes, create, save and open a text file, positioning by character, positioning by line, positioning by word, positioning in the word, positioning on a numbered line, inserting text, deleting text), Linux commands (date, cal, ls, mkdir, rmdir, rm, pwd, cp, cat, mv, shell, man, who, sort, sl, echo, grep, find, chmod, IO redirection and piping) Shell scripts (read, exit status of a command, positional parameters, eval, if, case, expr, while, until, for, break, continue, repeat, select) Miscellaneous (telnet, ftp, X Window, GNOME)

Practical Assignments

1. Write a script that will accept two file names from the command line, copy the first file to the second file and then display the contents of the combined file. Proper error message should be displayed in case the copy is not successful.
2. Write a script that will read a filename from the command line and will change the name of the file to filename.sal where sal is the *login name* of the user (E.g. if the filename is Lucky and the user's *login name* is harry then, the filename will be changed to Lucky.harry).
3. Peter's basic salary is input through the keyboard. His dearness allowance is 40% of his basic salary, and house rent allowance is 18% of the basic salary. Write a script to calculate his gross salary.
4. The distance between two cities (in km.) is input through the keyboard. Write a script to convert and print this distance in meters, feet, inches and centimeters.
5. The length and breadth of a rectangle and radius of a circle are input through the keyboard. Write a script to calculate the area and perimeter of the rectangle as well as the area and circumference of the circle.
6. If a five digit number is input through the keyboard, write a script to calculate the sum of its digits.
7. In a company, an employee is paid as follows. If his basic salary is less than Rs. 5000, then HRA = 10% of basic salary and DA = 90% of basic. If his salary is either equal or above Rs. 5000, then HRA = Rs. 300 and DA = 98% of basic salary. If the employee's salary is input through the keyboard, write a script to find his gross salary.
8. Write a script that will accept a filename from the keyboard and determine whether the file exists. If the file exists then its contents will be displayed else an error message will be displayed.
9. The marks obtained by a student in five different subjects are input through the keyboard. The student gets a division as per the following rules:

   Percentage above or equal to 60 – First division

   Percentage between 50 and 59 – Second division

   Percentage between 40 and 49 – Third division

   Percentage less than 40 – Fail

Write a script to find the division obtained by the student.

10. Write a shell script that will prompt the user to enter a character. The script will then determine whether the user entered a lowercase letter, an uppercase letter, a digit or a special symbol.

11. If the cost price and selling price of an item is input through the keyboard, write a script to determine whether the seller has made profit or incurred loss. Also determine how much profit was made or loss incurred.

12. An integer is input through the keyboard. Write a script to find out whether it is an odd or even number.

13. Write a shell script which receives any year from the keyboard and determines whether the year is leap or not. If no argument is supplied the current year should be assumed.

14. Write a shell script that will display all the multiples of 5 between 5 and 100.

15. Write a shell script that will display the multiplication table of any given number.

16. Write a shell script to find the factorial of any number entered through the keyboard.

17. Write a script to calculate overtime pay of 10 employees. Overtime is paid at the rate of Rs. 12 per hour for every hour worked above 42 hours. Assume that employees do not work for fractional part of an hour.

18. Two numbers are entered through the keyboard. Write a script to find the value of one number raised to the power of another.

19. Write a script to print all prime numbers between 1 and 150.

20. Write a program to generate all combinations of 1, 2, 3 and 4 using for loops.

21. Write a shell script that displays a list of all files in the current directory to which you have read, write and execute permissions.

22. Write a shell script that will receive any number of filenames as arguments. The shell script should check whether every argument supplied is a file or a directory. If it is a directory it should be appropriately reported. If it is a filename then name of the file as well as the number of lines present in it should be reported.

23. Write a script that will receive any number of filenames as arguments. The script should check whether such files already exist. If they do, then it should be reported. If these files do not exist then check if a sub-directory called *mydir* exists in the current directory. If it doesn't exist then it should be created and in it the files supplied as arguments should get created. If *mydir* already exists then it should be reported along with the number of files that are currently present in *mydir*.

24. Write a script that will accept a string from the keyboard and echo a suitable message if it doesn't have at least 10 characters.

25. Write a script that accepts a filename as argument and displays the last modification time if the file exists, and a suitable message if it doesn't.

Instruction for Paper Setter

(The question papers will be set according to the following scheme)

Unit	Questions	
	To be set	To be answered
I	2	1
II	2	1
III	2	1
IV	2	1
V	2	1
VI	2	1

Recommended Books

Text

1. **Andrew S Tanenbaum**, *Modern Operating Systems* (Second Ed.), Prentice Hall of India, New Delhi, 2002
2. **Sumitabha Das**, *UNIX Concepts & Applications*, (Second Ed.), Tata McGraw Hill, 2001

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Reference

1. **Bill Ball and David Pitt** *Red Hat Linux 7 unleashed*, Techmedia Publication 2001
2. **William Stallings**, *Operating Systems* (Fourth Ed), Prentice Hall of India, 2002
3. **Maurice J. Bach** *The Design of the Unix Operating System*, Prentice Hall of India, 2001
4. **Kernighan and Pike**, *The Unix Programming Environment*, Prentice Hall of India 1993

iii) Revised Syllabus for M A in Philosophy

The Board of Under-Graduate Studies in Philosophy in its meeting held on 29th April'03 considered and approved the Revised Syllabus for M A in Philosophy and also by the School Board of HUmanities and Education on the 8th May'03 which is placed as Annexure-'A'

The matter is placed before the Council for consideration.

Annexure-'A'

5:2:3(2)

Proposed revised syllabus for MA courses in Philosophy

Semester – I

PHIL.101 : Metaphysics (Indian)
PHIL.102 : Metaphysics (Western)
PHIL.103 : Symbolic Logic
PHIL.104 : Ethics and Environment

Semester – II

PHIL.201 : Epistemology (Indian)
PHIL.202 : Epistemology (Western)
PHIL.203 : Moral Philosophy (Indian)
PHIL.204 : Moral Philosophy (Western)

Semester – III

PHIL.301 : Analytic Philosophy
PHIL.302 : Social and Political Philosophy
Optional I
Optional II

Semester – IV

PHIL.401 : Modernism and Responses
PHIL.402 : Philosophy of Culture
Optional III
Optional IV

Optionals:

PHIL.3001 : Phenomenology and Existentialism
PHIL.3002 : Indian Aesthetics
PHIL.3003 : Tribal Thought and Culture
PHIL.3004 : Philosophy of Mind
PHIL.3005 : Modal Logic
PHIL.3006 : Philosophy of Post Modernism
PHIL. 3007: Contemporary Philosophy of Religion
PHIL.4001: Indian Philosophy of Language
PHIL.4002 : Philosophy of Religion
PHIL.4003 : Philosophy of Natural Sciences
PHIL.4004 : Philosophy of Human Rights
PHIL.4005 : Applied Ethics
PHIL.4006 : Philosophy of Wittgenstein
PHIL. 4007: Pancadasi

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Semester - I

PHIL. 101

METAPHYSICS (INDIAN)

UNIT – I : **Vedic Metaphysics**
(a) *Vedic deities*
(b) *Rta*
(c) *Comological Theories*

UNIT - II : ***Padartha***
(a) Jaina Categories
(b) Vaisesika Categories
(c) Carvaka's materialism

UNIT - III : ***Jiva, Jagat, Isvara and Brahman***
(a) Samkhya: *Purusa* and *Prakrti*
(b) Vedanta: (i) Sankar: *Saguna Brahman, Nirguna Brahman, Atman, Jagat*, (ii) Ramanuja: *Cit, Acit, Purusottam*
(c) Buddhists: Theory of momentariness, Non-Soul Theory

UNIT - IV : **Causation**
(a) *Svabhavavada*
(b) Pratityasamutpada
(c) *Satkaryavada*
(d) *Asatkaryavada*
(e) *Vivartavada*

Suggested Readings:

1. M. Philips, *Teachings of the Vedas*, Ch.3, Seema Publishers, Delhi, 1976.
2. F. Max Muller. *The Vedas*, The Indological Book House, Varanasi, 1969.
3. A.B. Keith, *The Religion and Philosophy of the Vedas and the Upanisads*, Part-V, Sections 26 & 27, Motilal Banarsidass, Delhi, 1976.
4. S.N. Dasgupta, *History of Indian Philosophy*, Motilal Banarsidass, Delhi, 1973.
5. M.C. Bharatiya, *Causality in Indian Philosophy*, Vimal Prakashan, Ghaziabad,1973.
6. M. Hiriyanna, *Outlines of Indian Philosophy*, George Allen & Unwin, London, 1973.
7. R.C. Zaehner, *Hinduism*, Chapters1 & 2, Oxford University Press, London, 1966.
8. K.K. Mittal, *Materialism in Indian Thought*, Munshiram Manoharlal, New Delhi, 1974.
9. K. Bhattacharyya, 'Carvaka Darsana', *Journal of Indian Council of Philosophical Research*, Vol. 12, No. 3, 1995.

Additional Readings:

1. S. Radhakrishnan, *History of Indian Philosophy*, Vols 1 & 2, George Allen & Unwin, London, 1973.
2. F. Max Muller, *Lectures on the Origin and Growth of Religion as Illustrated by the Religions of India*, Indological Book House, Varanasi, 1964.
3. Bharati Krishna, *Vedic Metaphysics*, Motilal Banarsidass, Delhi, 1973.
4. Donald H. Bishop, *Indian Thought*, Wiley Eastern Press, New Delhi, (1975) 1991.
5. Daya Krishna, *Indian Philosophy: A Counter-perspective*, Oxford University Press, Delhi, 1991.
6. Prjnananda, *School of Indian Philosophical Thought*, Firma K.L. Mukhopadhyaya, Calcutta, 1973.
7. C.D. Sharma, *Critical Survey of Indian Philosophy*, Motilal Banarsidass, Delhi, 1973.
8. J.N. Sinha, *Indian Realism*, Motilal Banarsidass, Delhi, 1972.

Semester – I

PHIL. 102

METAPHYSICS (WESTERN)

UNIT – I : **Realism**
Arguments for realism from
(a) Plato's theory of Form
(b) Aristotle's theory of Substance
(c) Frege's anti-psychologism
(d) Russell's logical atomism and Wittgenstein's *Tractatus*

UNIT – II : **Idealism**
(a) Berkeley's subjective idealism
(b) Kant's transcendental idealism
(c) Hegel and Bradley on absolute idealism
(d) G.E. Moore's 'refutation of idealism'

UNIT – III : **Language, Mind and Reality**
(a) Quine's ontological relativity
(b) Putnam's Internal Realism
(c) Dummett's anti-realism
(d) Davidson's robust realism

UNIT – IV : **Space and Time**

(a) The Concepts of Space and Time
(b) McTaggeart on the unreality of time
(c) Strawson on Basic Particulars
(d) Heidegger on the notion of Temporality

Suggested Readings:

1. A.E. Taylor, Plato: The Man and His work, Methuen Co. Ltd., London, 1963.
2. P.J. Allan, The Philosophy of Aristotle, Oxford University Press, Oxford,.....
3. P.T. Geach and Max Black (eds.), *Translations from the Philosophical Writings of Gotlob Frege*, Blackwell, Oxford,1950.
4. Bertrand Russell, 'The Philosophy of Logical Atomism'. in R.C. Marsh (ed.), *Logic and Knowledge*, Allen and Unwin, London, 1956.
5. Immanuel Kant, *Critique of Pure Reason*, N.K.Smith (trans.), Macmillan, London, 1929.
6. F.H. Bradley, *Appearance and Reality*, Sonnenschein, London, 1893.
7. G.E. Moore, 'The Refutation of Idealism', *Philosophical Studies*, Routledge and Kegan Paul Ltd., London, 1922, pp.1-30.
8. W.V.O. Quine, *Ontological Relativity and other Essays*, Columbia University Press, New York and London, 1969.
9. H. Putnam, *Mind, Language and Reality*, Philosophical Papers, Vol. 2, Cambridge University Press, Cambridge, 1975.
10. H. Putnam, *Reason, Truth and History*, Cambridge University Press, Cambridge, 1981.
11. M. Dummett, 'Realism', *Synthese*, 52, 1989, pp. 55-112.
12. D. Davidson, *Inquiries into Truth and Interpretation*, Clarendon Press, Oxford, 1982.
13. J.M.E. McTaggart, *The Nature of Existence*, Cambridge University Press, Cambridge, 1927.
14. P.F. Strawson, *Individuals: An Essay in Descriptive Metaphysics*, Methuen Co. Ltd., London, 1959.

Additional Readings:

1. P. Hylton (ed.), *Russel, Idealism and the Emergency of Analytic Philosophy*, Clarendon Press, Oxford, 1990.
2. G.N.A. Vessey (ed.), *Idealism Past and Present*, Cambridge University Press, Cambridge, 1982.
3. G.E. Moore, 'The Conception of reality', *Philosophical Studies*, Routledge and Kegan Paul, London, 1922, pp. 197-219.
4. A.M. Quinton, 'Absolute Idealism', in A. Kenny (ed.), *Rationalism, Empiricism and Idealism*, Clarendon Press, Oxford.

5. E. McGowan, 'The Neglected Controversy over Metaphysical Realism', *Philosophy*, 77, 2002, pp. 5-21.
6. M. Dummett, *Truth and Other Enigmas*, Duckworth, London, 1978.
7. H. Putnam, *Realism with a Human Face*, Harvard University Press, Cambridge, 1990.
8. W.V.O. Quine, *Word and Object*, MIT Press, Cambridge, 1960.
9. J.J.C. Smart (ed.), *Problems of Space and Time*, Collier-MacMillan, NewYork and London, 1964.
10. D.W. Hamlyn, *Metaphysics*, Cambridge University Press, Cambridge, 1984.
11. G.N. Schlesinger, *Metaphysics*, Blackwell, Oxford, 1983.
12. A.J. Ayer, *The Central Questions of Philosophy*, Penguin, Harmondsworth, 1976.
13. M. Heidegger, *Being and Time*, (Ed.) (Trans) J. Macquarie and E.S. Robinson, Harper &Row, New York, 1962; Basil and Blackwell, Oxford, 1973.

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Semester-I

PHIL. 103

SYMBOLIC LOGIC

UNIT – I : **Propositional Logic**

(a) Definition of connectives and symbolization of everyday Language

(b) Construction of Truth Tables

(i) to prove validity/invalidity of arguments,

(ii) to characterize statement forms as tautologies, contradictory and contingent,

(iii) to decide logical equivalences.

(c) Formal proof of validity and conditional proof.

(d) Indirect proof and strengthened rule of conditional proof.

(e) Proving validity/invalidity by Tree Method.

UNIT-II : **Predicate Logic**

(a) Singular Proposition, General Proposition and Symbolization

(b) Quantification Rules

(c) Proving Validity

(d) Proving Invalidity

UNIT-III : **Logic of Relations**

a) Symbolizing Relations

(b) Some Attributes of dyadic Relations

(c) Identity

(d) Definite Descriptions

UNIT-IV : **Set Theory**

(a) Membership, Inclusion, The Empty Set

(b) Operation on Sets, Domains of Individuals

(c) Translating Everyday Language

(d) Venn Diagrams

Suggested Readings:

1. I.M. Copi, *Symbolic Logic*, 5th edn., Prentice Hall of India, New Delhi, 1995. (pp. 8-82, pp. 116-150).
2. P. Suppes, *Introduction to Logic*, van Nostrand Reinhold Company, New York, 1957. (pp. 177-207)

3. A.H. Bason and D.J.O. Connor, *Introduction to Symbolic Logic*, Oxford University Press, 1953.
4. I.M. Copi and C. Cohen, *Introduction to Logic*, 10th edn., Pearson Education, Inc., Delhi, 20001.
5. R.R. Stoll, *Set Theory and Logic*, W.H. Freeman and Company, San Francisco and London, 1963.
6. P.F. Strawson, (Ed.) *Philosophical Logic*, Oxford University Press, London, 1967.
7. A. Singh & C. Goswami. *Fundamentals of Logic*, Indian Council of Philosophical Research, New Delhi, 1998.
8. S. Haack. *Philosophy of Logics*, Cambridge University Press, Cambridge, 1978.

Additional Readings:

1. P. Suppes, *Axiomatic Set Theory*, D.Van Nostarand Company, New York, 1960.
2. W.V.O. Quine, *Set Theory and its Logic*, Harvard University Press, Cambridge, 1963.
3. G.W. Pitcher, (Ed.), *Truth*, Prentice-Hall, Englewood Cliffs, New Jersey, 1964.
4. W.C. Kneale, *The Development of Logic*, Clarendon Press, Oxford, 1962.
5. I.M. Copi, *Introduction to Logic*, Mac Millan, 1968.
6. N. Kahane, *Logic and Philosophy*, Words Worth Publishing Com., 1975.
7. R.C. Jeffrey, *Formal Logic: Its Scope and Limits*, McGraw-Hill Book Company, New York, 1967.
8. T. Smiley (Ed.) *Philosophical Logic*, Oxford University Press, Oxford, 1998.

Semester – I

PHIL. 104

ETHICS AND ENVIRONMENT

UNIT – I : **Possibility of Ethics of Environment**
(a) Moral Agency and Nature
(b) Nature as the expression of the sublime
(c) Nature as an artifact

UNIT – II : **Kantian and Utilitarian Ethics**
(a) Autonomy of the rational will
(b) Utilitarianism
(c) Utilitarian Environmentalism

UNIT – III : **Nature as Repository of Values**
(a) Ecology
(b) Eco-systems
(c) Eco-interest
(d) Eco-feminism

UNIT – IV : **Environment and Religions**
(a) Christianity
(b) Hinduism
(c) Buddhism and Jainism
(d) Tribal Religions

Suggested Readings:

1. Immanuel Kant, *Critique of Practical Reason*, (Trans.) Lewis White Beck, Bobbs-Merril and Co., Indianapolis, 1956.
2. Immanuel Kant, *Critique of Judgement*, (Tran.) James C. Meredith, The Modern Library, New York, 1949.
3. J. Baird Callicott and Roger T. Ames (eds.), *Nature in Asian Traditions of Thought*, State University of NewYork, 1989, p. 269.
4. Zimmerman, Michal E., *Congesting Earth's Future. Radical Ecology and Post Modernity*. University of California Press, p.89.
5. John Passmore, *Man's Responsibility for Nature*. 2nd Edn., Routledge, London and New York, 1988.

Additional Readings:

1. Holmes Rolston, *Environmental Ethics: Duties to and Values to Natural World*, Temple University Press, Philadelphia, 1988.
2. Henry K. Skolimowski. *Eco-Philosophy: Designing New Tactics for Living*, Marion Boyars, Boston and London, 1981.
3. Francis A. Schaeffer, *Pollution and the Death of Man: The Christian View of Ecology*, Tyndale House, Wheaton, 1970.
4. S. Miri, *Ethics and Environment: Theory and Khasi and Adi Practice*, Spectrum Publishers, New Delhi, 2001.

5:2:3(10)

Semester - I

PHIL. 201

EPISTEMOLOGY (INDIAN)

UNIT – I : ***Prama***
(a) Nyaya
(b) Jainism
(c) Buddhism
(d) Mimamsa, Vedanta

UNIT – II : ***Pramanas***
(a) *Pratyaksa:* Analysis of *samnikarsa;* Determinate, indeterminate and extra-ordinary perception
(b) *Anumana:* Analysis of *vyapti, Svartha, parartha anumana; Purvavat, sesvat, samanyatodrsta; hetvabhasa*
(c) *Upamana,Arthapatti, Sabda, Anupalabdhi*
(d) *Saptabhangi naya* and *Syadvada*

UNIT – III : **Pramanyavada**
(a) Svatah Pramanyavada: Mimamsa, Vedanta , Samkhya
(b) Paratah Pramanyavada: Nyaya, Buddhism

UNIT – IV : **Khyativadas**
(a) Satkhyativada
(b) Asatkhyativada
(c) Satasatkhyativada
(d) Anyathakhyativada
(e) Akhyativada
(f) Anirvacaniyakhyativada

Suggested Readings:

1. S.C. Chatterjee, *Nyaya Theory of Knowledge*, Calcutta University Press, Calcutta, 1978.
2. D.M. Datta, *Six Ways of Knowing*, Calcutta University Press, Calcutta, 1972.
3. Theodore Stcherbatsky, *Buddhist Logic*, Vol. I, Chapters 1-3, Dover Publications, New York. 1962.
4. M. Hiriyanna, *Outlines of Indian Philosophy*, George Allen & Unwin, London, 1973.
5. N.K. Devaraja, *An Introduction to Sankara's Theory of Knowledge*. Motilal Banarsidass, Delhi, 1972.

Additional Readings:

1. J.N. Mohanty, *Reason and Tradition in Indian Thought*, Clarendon Press, Oxford, 1992.
2. B.K. Matilal, *Perception: An Essay on Classical Indian Theories of Knowledge*, Clarendon Press, Oxford, 1986.
3. Sibajivan Bhattacharyya, *Doubt, Belief and Knowledge*, Allied Publishers, Calcutta, 1987.
4. D.C. Guha, *Navya-Nyaya: A System of Logic*, Bharatiya Vidya Prakashan, Varanasi, 1968.
5. B. Kar, *The Theories of Error in Indian Philosophy*, Ajanta Publishers, Delhi, 1978.
6. N.N. Bhattacharya, *Jain Philosophy*, Munshiram Manoharlal, New Delhi. 1976.

Semester – II

PHIL. 202

EPISTEMOLOGY (WESTERN)

UNIT – I : **Scepticism and Knowledge**
(a) Varieties of Scepticism
(b) Arguments for Scepticism
(c) Varieties of Knowing

UNIT – II : **Knowledge as Justified True Belief**
(a) Belief condition
(b) Truth condition and Justification condition
(c) Gettier's Problem

UNIT – III : **Knowledge and Certainty**
(a) Certainty of *Cogito*
(b) Certainty of *a priori* knowledge
(c) Wittgenstein on Certainty

UNIT – IV : **Knowledge, Discourse and Truth**
(a) Subject-object distinction and the idea of Discourse
(b) Power, Truth and Knowledge
(c) Text, Interpretation and Deconstruction

5:2:3(12)

Suggested Readings:

1. K. Lehrer, *Knowledge*, Clarendon Press, Oxford, 1974.
2. A.P. Griffiths, *Knowledge and Belief*, Oxford University Press, London, 1967.
3. R.M. Chisholm, *Theory of Knowledge*, 2nd edition, Prentice Hall of India, New Delhi, 1987.
4. R. Hankinson, *The Sceptics*, Routledge, London and New York, 1995.
5. G.W. Pitcher, (ed.), *Truth*, Prentice Hall, Engelwood Cliffs, New Jersey, 1964.
6. J.L. Pollock, *Knowledge and Justification*, Princeton University Press, New Jersey, 1974.
7. E. Gettier, 'Is Justified True Belief knowledge?', in A.P. Griffiths(1967).
8. H. Kornblith, (ed.), *Naturalizing Epistemology*, The MIT Press, Cambridge, 1985.
9. E. Sosa, *Knowledge in Perspective: Selected Essays in Epistemology*, Cambridge University Press, Cambridge, 1991.
10. W.V.O. Quine, 'Epistemology Naturalized' in Kornblith (ed.), 1985, pp. 15-29.

Additional Readings:

1. S.E. Haldane and G.R.T. Ross (Trans.), *The Philosophical works of Descartes*, Vol. I and II, Cambridge University Press, Cambridge, 1911-12 and 1931, Dover Publications, New York, 1955.
2. S. Guttenplan, (ed.) *Mind and Language*, Oxford University Press, Oxford, 1975.
3. T. Triplett, 'Recent work on Foundationalism', *American Philosophical Quarterly*, Vol. 27, No.2, 1990, pp. 93-113.
4. S. Haack, 'Recent Obituaries of Epistemology', *American Philosophical Quarterly*, Vol. 27, No.3, pp.199-213.
5. J. Maffie, 'Recent work on Naturalized Epistemology', *American Philosophical Quarterly*, Vol. 27, No. 4, 1990, pp. 281-293.
6. A.I. Goldman, 'What is justified Belief?', in George Papoas (ed.) (1979), pp. 1-23; in Kornblith (ed.) (1985), pp.91-113.
7. P. Kitcher, 'A Priori Knowledge' *The Philosophical Review*, LXXVI, 1980, pp. 3-23. In Kornblith (ed.) (1985), pp.129-145.
8. G. Papas, (ed.), *Justification and Knowledge*, Reidel, Dordrecht, 1979.
9. C. Norris, *Deconstruction: Theory and Practice*, London, 1962.
10. I. Kant, *Critique of Pure Reason*, N.K. Smith (Trans.) Macmillan, London, 1929.
11. L. Wittgenstein, *On Certainty*, (Ed.), G.E.M. Anscombe and G.H. von Wright, (trans.) D. Paul and G.E.M. nscombe, Blackwell, Oxford, 1969.

5:2:3(13) *Semester – II*

PHIL. 203

MORAL PHILOSOPHY (INDIAN)

UNIT – I : ***Purusarthas***
(a) *Artha*
(b) *Kama*
(c) *Dharma*
(d) *Moksa*

UNIT – II : ***Karma* and Bondage**
(a) Jainism
(b) Buddhism
(c) Advaita Vedanta

UNIT – III : ***Sadhana***
(a) *Karma-yoga*
(b) *Jnana-yoga*
(c) *Bhakti-yoga*

UNIT – IV : **Buddhist and Jain Ideals**
(a) Buddhist Paramitas
(b) Jaina *Triratna*

Suggested Readings:

1. P. Nagaraj Rao, *Essays in Indian Philosophy and Religion*, Lavani Publishing House, New Delhi, 1971.
2. S. Gopalan, *Hindu Social Philosophy*, Wiley Eastern Publisher, New Delhi, 1979.
3. Bal Gangadhar Tilak, *Gita-rahasya*, Chapters 3 to 5; and 12. J.S. Tilak and S.S.Tilak, Pune, 1915.
4. S.N. Dasgupta, *A History of Indian Philosophy*, Vol. II, pp. 190-215; 439-536, Motilal Banarsidass, Delhi, 1969.
5. Har Dayal, *The Bodhisattva Doctrine in Buddhist Sanskrit Literature*, Chapter 5, Motilal Banarsidass, Delhi, 1970.
6. Dayanand Bhargava, *Jain Ethics*, Motilal Banarsidass, Delhi, 1968.

Additional Readings:

5:2:3(14)

1. Rajendra Prasad, *Karma, Causation and Retributive Morality*, Chapters 14-15, Munshiram Manoharlal Publishers. New Delhi. 1989.
2. Rajendra Prasad, *Varna-dharma, Niskama-karma and Practical Morality : A Critical Essay on Applied Ethics*, Part I. Chapters 1-2. D.K. Printworld, New Delhi, 1999.
3. Dayakrishna, '*Yajna* and the Doctrine of *Karma*: A Contradiction in IndianThought about Action', in *Journal of Indian Council of Philosophical Research*, pp.61-73, Jan-April, 1989.
4. Wendy O'Flaherty, *Karma and Rebirth in Classical Indian Traditions*, Motilal Banarsidass, Delhi, 1983.
5. Nalini Kant Brahma, *Philosophy of Hindu Sadhana*, Kegan Paul Trench Truber, London, 1982.
6. Vishvanath P. Verma, *Early Buddhism and Its Origin*, Munshiram Manoharlal Publishers, 1973.
7. Daya Krishna, *Indian Philosophy: A Counter Perspective*, Oxford University Press, Oxford, 1996.
8. T. N. Madan (ed.) *Way of Life*. New Delhi, 1982.
9. Karl H. Potter, (ed.), *Encyclopedia of Indian Philosophies*, Vol. III, Motilal Banarsidass, Delhi, 1981.
10. S.N. Gupta, *Indian Concept of Values*, New Delhi, 1966.

Semester – II

PHIL. 204

MORAL PHILOSOPHY (WESTERN)

UNIT – I : **Aristotelian Ethics**
(a) *Eudaimonia*
(b) Virtues
(c) *Phronesis*

UNIT – II : **Utilitarianism**
(a) Happiness, maximisation and altruism
(b) Liberalism and the individual
(c) Principles of Liberal Utilitarianism

UNIT – III : **Deontology**
(a) Stoic foundation of Kant
(b) Autonomy of the Will and Categorical imperative
(c) Moral principles in Intuitionism (G.E. Moore)

UNIT – IV : **Contemporary Debates**
(a) Liberalism vs. Communitarianism
(b) Liberal justice and justice as desert
(c) Relativism

Suggested Readings:

1. Aristotle, *Nicomachean Ethics*, trans. T.H. Irwin, Hackett, Indianapolis, 1985.
2. Robert Heinaman (ed.), *Aristotle and Moral Realism*, UCL Press Ltd., London, 1995.
3. *A Commentary on Kant's Groundwork of the Metaphysics of Morals*,
4. Alasdair MacIntyre, *After Virtue*, Duckworth, London, 1981.
5. Charles E. Larmore, *Patterns of Moral Complexity*, Cambridge University Press, Cambridge, (1987) 1992.
6. Matti Hayry, *Liberal Utilitarianism and Applied Ethics*, Routledge, London and New York, 1994.

Additional Readings:

1. Hugh LaFollette (ed.), *The Blackwell Guide to Ethical Theory*, Blackwell Publishers, Oxford, 2000.

2 David S. Oderberg, *Moral Theory: A Non-Consequentialist Approach*, Blackwell Publishers, Oxford, 2000.
3. Christopher Hamilton, *Living Philosophy: Reflections on Life, Meaning and Morality*, Edinburg University Press, Edinburg, 2001.
4. David Gauthier, *Morals by Agreement*, Oxford University Press, Oxford, 1986.
5. Nancy Sherman, *Making a Necessity of Virtue*, Cambridge University Press, Cambridge, 1997.

Semester – III

PHIL. 301

ANALYTIC PHILOSOPHY

UNIT – I : **Reference:**
(a) Frege's distinction of Sense and Reference
(b) Russell's Theory of Descriptions
(c) P.F. Strawson's response to Russell's Theory of Descriptions

UNIT – II : **Meaning:**
(a) Meaning and Use
(b) Meaning and Truth
(c) Meaning and Intention

UNIT – III : **Analyticity:**
(a) Quine's refutation of the Analytic-Synthetic distinction
(b) The defence of the Analytic-Synthetic distinction by H.P. Grice and P.F. Strawson
(c) H. Putnam on Analytic-Synthetic distinction

UNIT – IV : **Speech Acts:**
(a) *Austin's Theory of Speech Acts:* (i) Locutionary Acts, (ii) Illocutionary Acts, (iii) Perlocutionary Acts
(b) *Searle's Theory of Speech Acts:* (i) Refutation of Austin's Locutionary-Illocutionary distinction, (ii) Conditions of making a sincere premise

Suggested Readings:

1. R.R. Ammerman, (ed.) *Classics of Analytical Philosophy*, Tata McGraw Hill, Bombay and New Delhi, 1965.
2. J.F. Rosenberg and C. Travis (eds.), *Readings in the Philosophy of Language*, Printice-Hall Inc., Englewood Cliffs, New Jersey, 1971.

3. G. Frege, 'Sense and Reference', in Geach and Black (eds.), *The Philosophical Writings of Gottlob Frege*, Basil Blackwell, Oxford, 1960, pp.56-78.
4. B. Russell, 'Descriptions', *Introduction to Mathematical Philosophy*, George Allen and Unwin Ltd., London, 1919, pp.167-180. Reprinted in J.F. Rosenberg and C. Travis (eds.), (1971), pp.167-180, in R.R. Ammerman (ed.) (1965), pp. 16-24.
5. P.F. Strawson, 'On Referring', *Mind*, LIX, 1950, pp.320-344. Reprinted in J.F. Rosenberg and C. Travis (eds.) (1971), pp.175-195, in R.R. Ammerman (ed.) (1965), pp. 315-334.
6. W.P. Alston, 'Meaning and Use', *Philosophical Quarterly*, XIII, 1963, pp. 107-124. reprinted in J.F. Rosenberg and C. Travis (eds.) (1971), pp. 403-419.
7. D. Davidson, 'Truth and Meaning', *Synthese*, XVII, 1967, pp.304-323. Reprinted in J.F. Rosenberg and C. Travis (eds.) (1971), pp.450-465.
8. H.P. Grice, 'Meaning', *The Philosophical Review*, LXVI, 1957, pp. 377-388. Reprinted in J.F. Rosenberg and C. Travis (eds.) (1971), pp. 436-444.
9. W.V.O. Quine, 'Two Dogmas of Empiricism', *The Philosphical Review*, 60, 1950, pp. 20-43. Reprinted in Quine's *From a Logical Point of View*, Harvard University Press, Cambridge, Mass. 1953, pp. 20-46. Reprinted in J.F. Rosenberg and C. Travis (eds.) (1971), pp.63-80, in R.R. Ammerman (ed.) (1965), pp.197-213.
10. H.P. Grice and P.F. Strawson, 'In Defense of a Dogma', *The Philosophical Review*, LXV, 1956, pp.141-158. Reprinted in J.F. Rosenberg and C. Travis (eds.) (1971), pp. 81-94, in R.R. Ammerman (ed.) (1965), pp. 340-352.
11. H. Putnam, 'The Analytic and the Synthetic', in H. Feigl and G. Maxwell (eds.), *Minnesota Studies in the Philosphy of Science*, III, University of Minnesota Press, Minneapolis, 1966. In J.F. Rosenberg and C.Travis (eds.) (1971), pp. 94 -126.
12. J.L. Austin, *How to do Things with Words*, Oxford University Press, Oxford, 1962. (Lectures 8 to 12). Lectures 8, 9, and 11 are reprinted in J.F. Rosenberg and C. Travis (eds.) (1971), pp. 560-579.
13. J.R. Searle, 'Austin on Locutionary and Illocutionary Acts', *The Philosophical Review*, LXXVII, 1968, pp. 405-424. Reprinted in J.F. Rosenberg and C. Travis (eds.) (1971), pp. 262-275.
14. J.R. Searle, *Speech Acts: An Essay in the Philosophy of Language*, Cambridge University Press, London, 1963. (Chapter 3).

Additional Readings:

1. R.C. Pradhan, *Recent Developments in Analytic Philosophy*, Indian Council of Philosophical Research, New Delhi, 2001.
2. B. Russell, 'On Denoting', *Mind*, 14, 1905, pp. 479-493.
3. B. Russell, 'Mr. Strawson on Referring', *Mind*, 66,1957, pp. 385-389.
4. J.R. Searle, 'Proper Names', *Mind*, 67,1958, pp. 166-173.
5. P. Ziff, 'On H.P. Grice's Account of Meaning', *Analysis*, 28, No.1, 1967, pp.1-8.
6. P.F. Strawson, 'Intention and Convention in Speech Acts', *The Philosophical Review*, 73, 1964, pp. 439-460.

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Semester – III

PHIL. 302

SOCIAL AND POLITICAL PHILOSOPHY

UNIT – I : **Classical Liberalism**
(a) Hobbes: State of Nature, secularism, and social contract
(b) Locke: Natural state to Civil state
(c) Kant: Critique of social contract
(d) Mill: State and defense of liberty

UNIT – II : **Nation, State and Civil Society**
(a) Nation and nationalities
(b) Sovereignity and the State
(c) Role of Civil society in contemporary political life

UNIT – III : **Gandhian Thought**
(a) The idea of *Swaraj*
(b) *Satyagraha*
(c) The village republic
(d) *Ahimsa* and peace

UNIT – IV : **Modern Indian Political Philosophy**
(a) Sri Aurobindo: (i) Cycle of Society and its critique; (ii) Place and problem of reason in the individual and state/society; (iii) Towards the ideal of Human Unity
(b) M.N. Roy: Towards a New Humanism
(c) Jayaprakash Narayan: Idea of total revolution

Suggested Readings:

1. E.K. Bramsted and K.J. Melhuish (eds.), *Western Liberalism: A History in Documents*, Longman, London, 1978.
2. J. Charles King and James A. McGilvray, *Political and Social Philosophy*, McGraw-Hill Book company, New york, 1973.
3. David Boucher and Paul Kelly (eds.), *The Social Contract from Hobbes to Rawls*, Routledge, London, 1994.
4. John Rawls, *A Theory of Justice*, Oxford University Press, London, 1972.
5. Alasdair MacIntyre, *Whose Justice? Which Rationality?* Duckworth, London, 1988.
6. Karl Marx, *Economic and Political Manuscripts of 1844*, Progress Publishers, Moscow.
7. Karl Marx, *German Ideology*, Progress Publishers, Moscow.
8. Sri Aurobindo, *Social and Political Thought*, Vol. 15, Sri Aurobindo Ashram Trust, Pondicherry, 1971.

9. M.K. Gandhi, *Hind Swaraj*, Navajivan Press, Ahmedabad, 1955.Excerpts from *Young India* from Sriman Narayan, *The Selected Works of Mahatma Gandhi*, Vol. XIX, Navajivan Publishing House, Ahmedabad, 1969.
10. M.N. Roy, *Beyond Communism*, Ajanta Pub., New Delhi.
11. M.N. Roy, *New Humanism: A Manifesto*, Ajanta Pub., New Delhi.
12. David Selbourne, *Essays on Politics of J.P. Narayan*, Oxford University Press, New Delhi, 1985.

Additional Readings:

1.Peter A. Schouls, *Reasoned Freedom: John Locke and Enlightenment*, Cornell University Press, Ithaca, 1992.
2. Peter Laslett (ed.), *Philosophy, Politics and Society*, Basil Blackwell, Oxford, 1975.
3. Rajni Kothari, *Footsteps into the Future*, State University of New York Press, New York, 1974.
4. Bhikhu Parekh, *Gandhi's Political Philosophy*, Notre Dame University Press, Notre Dame, 1989.
5. Erich Fromm, *Marx's Concept of Man*, Fredrich Unger Pub. Co., New York, 1971.
6. Sri Aurobindo, *Foundations of Indian Culture*, Sri Aurobindo Ashram, Pondicherry, (1959) 1988.
7. D.R. Bali, *Modern Indian Thought from Rammohan Roy to Jayaprakash Narayan*, Sterling Publishers, New Delhi, 1988.
8. R.N. Iyer, *The Moral and Political Thought of Mahatma Gandhi*, Oxford University Press, New Delhi, 1973.
9. K.F. Koerner, *Liberalism and its Critics*, Croom Helm, London, 1985.
10. J.M. Barbalet, *Marx's Construction of Social Theory*, Routledge and Kegan Paul, London, 1983.
11. Brian Barry, *The Liberal Theory of Justice*, Oxford University Press, Oxford, 1973.

Semester – III

PHIL. 3001

PHENOMENOLOGY AND EXISTENTIALISM*

UNIT – I : **Husserl**
(a) Intentionality of consciousness.
(b) Phenomenological reduction and its stages
(c) Pure consciousness and transcendental subjectivity

UNIT – II : **Morley Ponty**
(a) Limits of Phenomenological reduction
(b) Intersubjectivity
(c) Philosophy of Body

UNIT – III : **Heidegger**
(a) Being, nothingness and temporality
(b) Distinction between Being and being
(c) Dasein and being-in-the-world

UNIT – V : **Sartre**
(a) Being-in-itself, Being-for-itself, and Being-for-others
(b) Freedom and authenticity
(c) Bad faith

* There should be four introductory lectures on the above movement.

Suggested Readings:

1. Edmund Husserl, *Ideas: A General Introduction to Pure Phenomenology*, trans. W.R. Boyce Gibson, George Allen & Unwin Ltd., London, 1931.
2. Edmund Husserl, *Experience and Judgement*, trans. James Churchill and Karl Americks, Routledge and Kegan Paul, London, 1973.
3. Edmund Husserl, *Cartesian Meditations*, trans. Dorian Cairns, Martinus Nijhiff, Hague, 1960.
4. Martin Heidegger, *Being and Time*, trans. John Macquarrie and Edward Robinson, Basil Blackwell, Oxford, 1978.
5. ..... *being and Nothingness*, Tr. Hazel Barness, New York: Philosophical Library, 1956.
6. ..... *Existentialism and Humanism*, Eyre Methuen Ltd., London, 1977 edn..

Additional Readings:

1. Herbert Spielberg: *The Phenomenological Movement*, Vols. I & II, The Hague: Martinus Nijhoff, 1971
2. Marvin Farber: *The Aims of Phenomenology*, New York: Harper Row, 1966
3. Mrinal K. Bhadra: *A Critical Survey of Phenomenology and Existentialism*, New Delhi: ICPR, 1990
4. H.J. Blackham: *Six Existentialist Thinkers*, New York, 1959
5. John Macquarrie: *Existentialism*, Penguin Books, 1973
6. William A. Luitfen: *Existentialist Phenomenology*, Tr. Henry J. Koren, Pittsburgh: Duquesne University Press, 1960
7. J.J. Kockelmans: *A First Introduction to Husserl's Phenomenology*, Pittsburgh: Duquesne University Press, 1967
8. J.L. Mehta: *The Philosophy of Martin Heidegger*, Varanasi: Banaras Hindu University, 1967
9. Mark C. Taylor: *Kierkegaard's Pseudonymous Authorship*, Princeton: Princeton University Press, 1971

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Semester-III

PHIL. 3002

INDIAN AESTHETICS

UNIT – I : **Foundations of Indian Aesthetics**

(a) Indian Philosophy of beauty
(b) Axiology and Aesthetics
(c) Instrumental value of Aesthetics

UNIT – II : **Aesthetic Pleasure (Rasa)**

(a) Subjective factors: *Sthayibhava, Pratibha*
(b) Objective factors: *Sthayibhava, vibhava, anubhava, vyabhicaribhava*
(c) Number of rasas?

UNIT – III : **Aesthetic Method (Dhvani)**

(a) Existence of *Dhvani*
(b) *Dhvani* and *Kavya*
(c) In Defence of *Dhvani*: Views of Vamana Pratiharenduraja, Srisankuka and Pramanavadians

UNIT – IV : **Theories of Rasa**

(a) *Rasotpattivada* of Bhatta Lollata
(b) *Rasanumitivada* of Srisankuka
(c) *Rasabhuktivada* of Bhatta-Nayaka
(d) *Rasabhavya kttivada* of Abhinavagupta

Suggested Readings

1. T.S. Nandi, *The Origin and Development of the Theory of Rasa and Dhavani in Sanskrit Poetics*, Gujarat University, Ahmedabad, 1973.
2. Padma Sudhi, *Aesthetic Theories of India*, Vol.1, 2 & 3, Intellectual Publishing House, New Delhi, 1983.
3. H.R.Mishra, *Theory of Rasa in Sanskrit Drama*,Vindhyacala Prakashan, ..., 1964.
4. S.K. Saxena, *Aesthetical Essays*, Chanakya Publications, New Delhi, 1981.
5. A. Shankaran, Rasa and Dhvani, Madras University Press, Madras, 1973.
6. Roger Lipsey, *Coomarswamy . Selected Papers*, Oxford University Press, Delhi, 1986.
7. Chakravarti, *Philosophy of Sanskrit Grammar*,

8. Gaurinath Sastri, *Philosophy of Word and Meaning*, Calcutta University Press, Calcutta, 1959.
9. K.C.Pandey, *Comparative Aesthetics*, vol.1, *Indian Aesthetics*, Chowkhamba Sanskrit Series, Varanasi, 1950.
10. *Dhvanyaloka of Anandavardhana*, Edt. K.Krishnamoorthy, Dharwar: Karnatak University, 1974.
11. *Natyasastra of Bharata*, Vol.I, Edt. M. Ramakrishna Kavi. Baroda: Oriental Institute, 1976.
12. M.Hiriyanna, *Art Experience*, Mysore: Kavyalaya Publishers, 1954, 1974.
13. M.Hiriyanna, *Indian conception of Values*, Mysore: Kavyalaya Publishers, 1975.
14. P.V. Kane, *History of Sanskrit Poetics*, Motilal Banarsidass, Delhi, 1971.
15. V.Raghavan, *The Number of Rasas*, The Adyar Library, Madras. 1940.
16. V. Raghavan, *Studies on Some Concepts of the Alamkarasastra*, Adyar Library, Madras, 1973.

Additional Readings:

1. R. Gnoli, *The Aesthetic Experience according to Abhinava Gupta*, Chowkhemba Sanskrit Studies. Vol.XLII, Varanasi, 1968.
2. K. Krishna moorty, *Studies in Indian Aesthetics and Criticism*, Kavyalaya, Mysore, 1979.
3. K.Krishnamoorty, *The Dhvanyaloka and Its Critics*, Kavyalaya, Mysore, 1968.
4. Sushil Kr.De, *History of Sanskrit Poetics*, Firma K.L. Mukhopadhyaya, Calcutta, 1960.
5. Kalipada Giri, *Concept of Poetry, An Indian Approach*, Sanskrit Pusthak Bhandar, Calcutta, 1975.
6. E.B. Havell, *The Ideals of Indian Art*, Indological Book House, Delhi, 1972.

Semester-II

PHIL.3003

TRIBAL THOUGHT AND CULTURE

UNIT - I: **Fundamental Concepts:**
(a) Concept of Tribe and Ethnicity
(a) Distinctiveness of a Tribal Culture
(c) Tribal World View

UNIT - II: **Cosmic Order and Epistemology:**
(a) Man, Nature and the DivineGod and Creation
(b) Rationality and Irrationality
(c) The possibility of Inter-Cultural Dialogue

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UNIT - III: **Anthropology and Tribal Studies:**
(a) Frazer
(b) Malinowski
(c) Geertz

UNIT - IV: **Tradition and Change:**
(a) Tradition-economy and Education
(b) Issues of Identity
(c) Challenges of Modernity

Suggested Readings :

1. Mrinal Miri, : *Identity and the Moral Life*, Oxford University Press, New Delhi, 2003.
2. Giddens, Anthony : *Modernity and Self Identity*, Stanford University Press, 1991.
3. Berlin, I. : *Concepts and Categories*, Hogarth Press, 1978.
4. Connor, S. : *Theory and Cultural Value*, Basil Blackwell, 1992.
5. Hacking, I. : *The Taming of Change*, Cambridge University Press, 1990.
6. Leutricchia, J. : *Criticism and Social Change*, Chicago University Press, 1983.
7. Ryan, A. : *'When it's rational to be irrational'* New York Review of Books, 10 October, 1991.
8. Thomas, K. : *Religion and the Decline of Magic*, Penguin, 1980.
9. Geertz, C. : *The Interpretation of Cultures*, Hutchinson, 1975.
10. Wittgenstein, L. : *Remarks on Frazer's 'Golden Bough'* (ed) R. Rhees Humanities Press, N.J., 1979.
11. Malwnouski, B. : *A Scientific Theory of Culture and other essays*, Chapel Hill, University of North California Press, 1944.
12. Torrance Robert M. (ed) : *Encompassing Nature : A source book counterpoint*, Washington, 1998.

Additional Readings :

1. Bennett, Tony : *Culture : A Reformer's Science*, Sydney Allan and Unwin, 1998.
2. Clifford James and Marcus George (eds) : *Writing Culture*, Berkeley University of California Press, 1986.
3. Crane, Diana : *The Production of Culture*, Newbury Park Sage, 1992.
4. Douglas, Mary : *Natural Symbols : Exploration in Cosmology*, London Barrie and Rockcliff, 1970.
5. Frow John : *Time and Commodity Culture*, Oxford University Press, 1998.
6. Goffman Erving : *The Presentation of Self in Everyday Life*. Doubleday,

London, 1959.

7. Habermas : *"Modernity Versus Post-modernity"* New German Critique 22 Winter 3-14.
8. Heritage John, : *Garfinkel and Ethnomethodology*, Cambridge Polity Press, 1984.
9. Jacobs, Ronald : *"Civil Society and Crisis"* American Journal of Sociology 101.5 : 1238-72.
10. Sahlins, Marshall : *Culture and Practical Reason*, University of Chicago Press, 1976.
11. Waters, Malcolm : *Globalization*. Routledge, London, 1995.
12. Sapir, E. : *Culture, Language and Personality*, University of California Press, 1949.
13. Torrance Robert M. : *The Spiritual Quest : Transcendence in Myth, Religion and Science*. University of California Press, Berkeley, 1994.
14. Elliott, Anthony : *Psychoanalytic Theory*, Blackwell, Oxford, 1994.
15. Smith Philip : *Cultural Theory*, Blackwell Publishers Inc., USA, 2001.

Semester- III

PHIL.3004

PHILOSOPHY OF MIND

UNIT – I : **Theories of Mind:**
(a) Mind as substance
(b) Mind-Brain Identity
(c) Hermeneutic Unity of mind and body

UNIT – II : **Mental Contents:**
(a) Sensation
(b) Emotion
(c) Thought

UNIT – III : **Knowledge and Mind:**
(a) Self-knowledge and knowledge of others
(b) Self-identity
(c) Agency

UNIT – IV : **Mind and Machine:**
(a) Idea of the Machine
(b) Artificial Intelligence
(c) Machine and Consciousness

Suggested Readings :

1. R. Descartes, *Meditations.*
2. G. Ryle. *The Concept of Mind*, (London, Hutchinson, 1949).
3. D. Armstrong, *A Materialist Theory of Mind*, (London, Portledge, 1968).
4. D. Davidson, *Essays on Actions and Events*, (Oxford, Clarendon Press, 1980).
5. H. Putnam. *Mind, Language and Reality*, (Cambridge, Cambridge University Press, 1975).
6. P. T. Geach, *Mental Acts*, (London, Routledge, 1957).
7. J. Fodor, *The Language of Thought* (Hassocks: Harvester Press, 1976).
8. B.O. Shaughnessy, *The Will* (Cambridge, Cambridge University Press, 1981).
9. B. Williams, *Problems of The Self* (Cambridge, Cambridge University Press, 1973).

Additional Readings:

1. Jonathan Glover, *The Philosophy of Mind*, Oxford, 1976, 1980.

2. Colin McGinn, *The Character of Mind*, Oxford, 1997.
3. Jerome A. Shaffer, *Philosophy of Mind*, Prentice Hall, 1968.

4. Peter Smith & O.R. Jones, *The Philosophy of Mind*, Cambridge University Press, 1986, 1993.

5. P.M.S. Hacker, *Wittgenstein: Meaning and Mind*, Blackwell, Oxford, 1990, 1993.

6. Hilary Putnam, *Mind, Language and Reality*, Cambridge University Press, 1975, 1992.

Semester-III

PHIL. 3005

MODAL LOGIC

UNIT – I : **Non-modal Propositional Calculus:**

(a) Primitive symbols, logical operators and formation rules

(b) Testing for validity and invalidity:

- (i) Truth-table method
- (ii) Truth tree method
- (iii) Reductio method
- (iv) Substitution of equivalents
- (v) Conjunctive normal form

(c) Axiomatization of PC system

(d) The system PM

(e) Consistency and Completeness

UNIT – II : **The System T:**
(a) Modal notions
(b) Axioms
(c) Method of setting out proofs
(d) Proofs of theorems
(e) Decision procedure
(f) Consistency and completeness

UNIT – III : **The System S4:**
(a) Modalities
(b) Axioms
(c) Method of setting out proofs
(d) Proofs of theorems
(e) Decision procedure
(f) Consistency and completeness

UNIT – IV : **The System S5:**
(a) Modalities
(b) Axioms
(c) Method of setting out proofs
(d) Proofs of theorems
(e) Decision procedure
(f) Consistency and completeness

Suggested Reading :

1. Hughes, G.E., and M. J.Cresswell, *Introduction to Modal Logic*, London, Methuen, 1968.

Additional Readings:

1. Van Wright, G.H. An Essay in Model Logic, Amsterdam: North Holland, 1951
2. Howard Kahane: Logic and Philosophy, Wadsworth publishing company, California, 1973.
3. C.I. Lewis and C.H.Langford, Symbolic Logic, 2nd Edition, Dover publications Newyork, 1959.
4. Gustav Bergmann, 'The Philosophical Significance of Modal Logic', Mind, Vol.69, 1960.
5. W. Kneale and M. Kneale, The Development of Logic, Oxford University Press, London, 1962.
6. Herbert Feigl and May BrodBeck (eds) Readings in the Philosophy of Science Appleton-century-crofts,inc,1953.

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UNIT – II : **The System T**
(a) Modal notions
(b) Axioms
(c) Method of setting out proofs
(d) Proofs of theorems
(e) Decision procedure
(f) Consistency and completeness

UNIT – III : **The System S4:**
(a) Modalities
(b) Axioms
(c) Method of setting out proofs
(d) Proofs of theorems
(e) Decision procedure
(f) Consistency and completeness

UNIT – IV : **The System S5:**
(a) Modalities
(b) Axioms
(c) Method of setting out proofs
(d) Proofs of theorems
(e) Decision procedure
(f) Consistency and completeness

Suggested Reading :

1. Hughes, G.E., and M. J.Cresswell, *Introduction to Modal Logic*, London, Methven, 1968.

Additional Readings:

1. Van Wright, G.H. An Essay in Model Logic, Amsterdam: North Holland, 1951.
2. Howard Kahane; Logic and Philosophy, Wadsworth publishing company. California, 1973.
3. C.I. Lewis and C.H.Langford, Symbolic Logic, 2nd Edition, Dover publications Newyon, 1959.
4. Gustav bergmann, 'The Philosophical Significance of Modal Logic', Mind, Vol.69, 960.
5. W. Kneale and M. Kneale, The Development of Logic, Oxford University Press, London, 962.
6. Herbert Feigl and May BrodBeck (eds) Readings in the Philosophy of Science Appleton-century-crofts,inc.1953.

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Semester-III
PHIL.3006

PHILOSOPHY OF POST MODERNISM

Unit I: **Rise of Post modernism:**
(a) Enlightenment Project
(b) Pluralism
(c) Contingency and Rejection of essence

Unit II: **Grounds of Post-modernist Thought**
(a) Nietzche: Relativity of Truth
(b) Habermas: Creatique of intersubjectivist paradigm of communicative action
(c) Rorty: post modernism in bourgeois liberalism

Unit III: **Select Post-modernist Theories**
(a) Foucault: problem of the autonomy of the self
(b) Lyotard: scientific knowledge, meta-narratives, and narratives
(c) Derrida: deconstruction

Unit IV **Application of Postmodernism and Its Critique**
(a) Politics of Knowledge: problem in social sciences
(b) Feminist theorizing and epistemology
(c) Postmodernism and literary criticism.

Suggested Readings:

1. Christopher Norris, *Truth about Postmodernism*, Oxford: Blackwell, 1994
2. ....., *Post Modern Conditions*
3. John Murphy, *Postmodernism*, Ann Books, Meerut.
4. Bryan Turner, *Theories of Modernity and Post-modernity*, Sage Publications, London, 1992.
5. Patricia Waugh, *Postmodernism: A Reader*, Edward Arneld, London, 1992.
7. Richard Rorty, *Objectivity, Relativism and Truth*, Cambridge University Press, Cambridge, 1991.

Additional Readings:

1. Frank B. Farrel, *Subjectivity, Realism and Postmodernism*, Cambridge University Press, 1994.
2. Zygment Bauman, *Post-modern Ethics*, Polity Press, Cambridge, 1994.
3. Stephen K. White, *Political Theory and Postmodernism*, Cambridge Univedrsity Press, 1991.
4. N.J. Rengger, *Political Theory, Modernity and Post-modernity: Beyond Enlightenment and Critique*, Blackwell, Oxford, 1995.

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5. Alex callinos, *Against Postmodernism: A Critique*, Polity Press, Cambridge, 1994.
6. David Lyon, *Post-modernity. Beyond Post-modern Politics*, Open University Press, Buckingham, 1994.

Semester-III

PHIL. 3007

CONTEMPORARY PHILOSOPHY OF RELIGION

UNIT – I : **Paul Tillich:**
(a) Human Predicament
(b) The rapture of Psyche
(c) Truth of Faith

UNIT – II : **Flew-MacIntyre; Mitchell-Crombie-R.M. Hare; D.Z. Phillips:**
(a) Verification/falsification
(b) Language game and Religion
(c) Superstition, miracles and Religion.

UNIT – III : **John Hick:**
(a) Eschatology
(b) Death and Immortality
(c) Life-After/ Beautitude.

UNIT – IV : **Braith waite:**
(a Nature of Religious Belief
(b Reduction of religion
(c Critique of Reductionism

Suggested Readings:

1. Paul Tillich, *Eternal Now*, Part I, Chapter I, Charles Scribner's Sons, New York, 1962.
2. Paul Tillich, *Dynamics of Faith*, Chapter 5, New York: Harper and Brothers, 1958.
3. D.Z. Phillips, 'Religious Beliefs and Language Games' in *Philosophy of Religion*, Edt. Basil Mitchell, London: Oxford University Press, 1971.
4. Anthony Flew, Edt., *New Essays in Philosophical Theology* London: SCM Press, 1992, reprint.
5. John Wisdom, 'Gods', in John Hick, Edt. *Classical and Contemporary Readings in the Philosophy of Religion*, Englewood Cliffs, N. Jersey : Prentice Hall, Inc., 2000 reprint.
6. John Hick, *Death and Eternal Life*, London: Collins, 1996 reprint.
7. R.B. Braithwaite. " Empiricist's on nature of Religious Beliefs", in John Hick Edt,.
8. Ramachandra Gandhi, *Availability of Religious Language*, Oxford University Press, 1982.

Additional Readings:

1. Paul Tillich, *The Ultimate Concern*, London: SCM Press, 1965.
2. Paul Tillich, *The Future of Religion*, New York: Harper and Row Publishers, 1966.
3. D.Z. Phillips, *Death and Immortality*, London: MacMillan 1970.
4. D.Z. Phillips, *Religion Without Explanation*, Oxford: Basil Blackwell, 1976.
5. Paul and Linda Badhane, *Immortality or Extinction*, London:Macmillan & Company, 1981.
6. Wittgenstein Ludwig, *Philosophical Investigations*, Trans. G.E.M. Anscombe, Oxford: Basic Blackwell & Mott, 1958 Edn.
7. Richard Niebuhr, *Radical Monotheism and Western Culture*, New York: Harper and Row, 1960.
8. Alvin Plantinga, *The Nature of Necessity*, Oxford:Clarendon Press,1990 Edn.

Semester – IV

PHIL. 401

MODERNISM AND RESPONSES

UNIT – I : **Descartes and Kant**
(a) Problem of Knowledge
(b) Problem of Reality

UNIT – II : **Popper and Kuhn**
(a) Rationality
(b) Objectivity
(c) Truth

UNIT – III : **Freud and Foucault**
(a) Sexuality
(b) Power

UNIT – IV : **Gandhi and Ambedkar**
(a) Morality
(b) Modern Civilization

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Suggested Readings:

1. R. Descartes, *Meditations*, (Relevant chapters), in *Descartes' Meditations and Other Selections*, Open Court, Chicago, 1912.
2. I. Kant, 'An Answer to the Question, What is Enlightenment?', trans. H.B.Nis-bet, in *Kant's Political Writings*, Cambridge University Press, Cambridge, 1970.
3. K. Popper, *Conjectures and Refutations*, Chapter10, pp. 215-250, Routledge and Kegan Paul, London, 1963.
4. Thomas Kuhn, *The Structure of Scientific Revolution*, (Relevant chapters), Chicago University Press, Chicago, 1970.
5. S. Freud, *Civilization and Its Discontents in Collected Works of Freud*, trans. Joan Riviers, Hogarth Press, London, 1975.
6. M. Foucault, *Madness and Civilization*, trans. R. Howard, Tavistock, London, 1965.
7. M. Foucault, *The History of Sexuality*, Vol.1, trans. R. Harley, Penguin, London, 1988.
8. M.K. Gandhi, *Hind Swaraj*, Navjivan Publishers, Ahmedabad, 1942.
9. B. Parekh, *Gandhi's Political Philosophy*, Notre Dame University Press, Notre Dame, 1989.

Additional Readings

1. M. Miri, 'Explanation and Description in Freud', *Philosophy of Psycho-analysis*, Indian Institute of Advanced Study, Simla, 1977.
2. N. Gerald Zeuberg, *The Existentialist Critique of Freud: The Crisis of Autonomy*, Princeton University Press, Princeton, 1976.
3. Kimberley Hutchings, *Kant: Critique and Politics*, Routledge, London, 1996.
4. Alascair MacIntyre, *After Virtue: A Study in Moral Theory*, Gerald Duckworth & Co. Ltd., London, 1981.
5. Charles Taylor, *Sources of the Self: The Making of the Modern Identity*, Cambridge University Press, Cambridge, 1989.
6. Gary Gutting (ed.), *The Cambridge Companion to Foucault*, Cambridge University Press, Cambridge, 1994.
7. Stephen K. White, *Political Theory and Postmodernism*, Cambridge University Press, Cambridge, 1991.
8. Bryan Turner (ed.), *Theories of Modernity and Postmodernity*, (Theory, Culture & Society), Sage Publications, London, 1990.
9. Zygmunt Bauman, *Modernity and Ambivalence*, Polity Press, Cambridge, 1993.
10. Zygmunt Bauman, *Post-modernity and Its Discontents*, Polity Press and Blackwell Publishers, Cambridge, 1997.

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Semester – IV

PHIL. 402

PHILOSOPHY OF CULTURE

UNIT – I : **Problem of Culture**
(a) Philosophy of Culture and Cultural Anthropology
(b) Nature and Culture
(c) Cultural Identity

UNIT – II : **Theories of Culture**
(a) Structuralism and Functionalism
(b) Culture as Superstructure
(c) Psychoanalysis

UNIT – III : **Critique of Traditional Theories:**
(a) Culture as Text (Narrative and Hermeneutics)
(b) Post-Modern Concept of Culture
(c) Post-Structural Critical Theory

UNIT – IV : **Tradition, Change and Cultural Progress:**
(a) Idea of Tradition and Modernity
(b) Autonomy of Culture
(c) Change and Creativity

Suggested Readings:

1. Philip Smith, *Cultural Theory*, Blackwell Publishers, Oxford, 2001
2. Simon Clarke, *Foundations of Structuralism*, The Harvester Press, Sussex, 1981
3. Terry Eagleton, The *Idea of Culture*, Blackwell, Oxford, 2001
4. Levi-Styrauss,C., *Structural Anthropology*, Basic Books Paul, 1970
5. Jeet Uberoi, *Science and Culture*, Oxford University Press, New Delhi
6. Turner Bryan (ed) *Theories of Modernity and pos-modernity*, Sage, London, 1990
7. Habermas, J. *The Philosophical Discourse of Moderrnity*, Polity Press, 1987
8. Fred Inglis, *Cultural Studies*, Blackwell Publishes, Oxford, 1994
9. A.K. Saron, "The Traditional Vision of Man" in *Language, Tradition and Modernity* (eds) R.C. Gandhi

Additional Readings:

1. G.C. Pande, *The Meaning and Process of Culture*, Shival Lal Agarwal & Company, Agra, 1972

2. James F. Downs, *Culture in Crisis*, USA, 1971
3. Martin Holis (e) *Rationality and Relativism*, Blackwell, 1993.
4. R. Firth, *Man and Culture*, Humanities Press, 1970
5. Kvoeber, A.C. and Chuckhohn Clyde, *Culture A Critical Review of Concepts and Definitions*, MA Peabody Museum, Cambridge, 1952
6. N.K. Devaraj, *Philosophy of Culture*, Kitab Mahal, Allahabad, 1963
7. Reissman Catherine Kohler, *Narrative Analysis*, Newbury Park CA Sage, 1993
8. Jackson L, *The Poverty of Structuralism and Structuralist Theory*, Longman, 1991
9. Elliot, *Psychoanalytic Theory*, Blackwell, Oxford, 1994.

Semester – IV

PHIL. 4001
INDIAN PHILOSOPHY OF LANGUAGE

UNIT – I : **Nature and Classification of Sabda :**
(a) Nature of Sabda
(b) Classification of Sabda:
i) Vaidic Sabda, Laukika Sabda
ii) Drstartha Sabda, Adrstartha Sabda
iii) Pauruseya Sabda, Apauruseya Sabda
iv) Sruti and Smrti.

UNIT – II : **Word meaning and import:**
(a) Theories of word- meaning
i) Abhidha
ii) Laksna
iii) Vyanjna
(b) Theories of word-import :
i) Vyaktivada
ii) Akrtivada
iii) Jativada
iv) Jatiaktavyaktivada
v) Jativisistavyaktivada
vi) Apohavada
vii) Sphotavada

UNIT – III : **Sentential meaning**
a) Conditions for knowing sentential meaning:
i) Akanksa
ii) Yogyata
iii) Samnidh
iv) Tatparya

(b) Comprehension of sentential meaning:
   i) Anvitabhidhanvada
   ii) Abhititanvayavada

UNIT – IV : **Ontology of Sabda**:
(a) Nyaya theory of non-eternity of Sabda
(b) Mimamsa theory of eternity of Sabda
(c) Bhartrhari's theory of Sabda Brahman.

Suggested Readings:

1. S.C. Chatterjee, The Nyaya Theory of Knowledge, Universityof Calcutta (1978) Ch. XVII, XVIII, XIX, pp.317-349.

2. D.M. Datta, The Six Ways of Knowing, University of Calcutta, (1972), Ch.III, IV. pp. 267-319.

3. Othmar Gachter, Hermeneutics and Language in Purva Mimamsa: A Study in Sabara Bhasya. Motilal Banarasidass, Delhi (1983) Ch.III, IV, pp.28-73.

4. Raja Ram Dravid, The Problems of Universals in Indian Philosophy, Motilal Banarasidass, Delhi (Ist ed.) (1972) Ch.VIII, IX and XI, pp.185-259.

5. K. Raghavan Pillai, The Vakyapadiya, Motilal Banarasidass,Delhi (1971), pp.1-35.

6. Jayanta Bhatta's Nyaya Manjari translated by Janaki Vallabha Bhattacharyya, Vol. I, Motilal Banarasidass, Delhi, 1978.

7. Annambhatta's Tarkasamgraha – Dipika, on Tarkasangraha Translated by Gopinath Bhattacharya progressive publishers, Calcutta, 1983.

Additional Readings:

1. V. Prakasen and Anvita Abbi, Semantic Theories and Language Teaching, Allied Publisher, New Delhi (.986).

2. R.C. Pandey, Indian Theories Meaning, Motilal Banarasidass, Delhi.

3. Th. Stcherbatsky, The Buddhist Logic Vol.I, Dover Publications, New York (1962), Ch.IV.

4. B.E. Motilal, Epistemology, Logic, and Grammar in Indian Philosophical Analysis. Moutou, the Hague, Paris. (1971).
5. Gaurinath Sastri, The Philosophy of Word and Meaning, Calcutta, (1959).
6. S. Kuppuswami Sastri, A Primer of Indian Logic, Madras, (erd Ed.) 1961.
7. Raja K. Kunjunni, Indian Theories of Meaning, Madras, (1963).
8 B.K. Motilal, The Word and the World. New Delhi, Oxford University Press, 1990.
9. Bhartrhari, Vakyapadiyam commentary by Satyakam Varma, Munshiram Manohar Lal, New Delhi, 1970.

Semester – IV

PHIL. 4002

PHILOSOPHY OF RELIGION

UNIT – I - **The Concept of Religion**
(a) Supernaturalism :
(i)The Idea of the Holy / Transcendence
(ii)Mysterium Tremendum
(b) Naturalism:
(i) Animism, magic, materialism
(ii) Socio-cultural theories
(iii)Psychological theories

UNIT – II - **The Concept of God and Human Predicament:**
(a) Faith
(b) Suffering and Evil
(c) Salvation and Human Destiny

UNIT – III - **Religious language:**
(a) Nature of Religious Language, Theology and Falsification
(b) Cognitive Theory
(c) Analogical Theory
(d) Symbolic Theory
(e) Game Theory

UNIT – IV - **Religious Pluralism and Dialogue:**
(a)Multiculturalism and Religious Pluralism
(b)Dialogue: Inter-religious and Intra-religious

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Suggested Readings:

1. P. Tillich, *What is Religion*, Harper and Row, (1969).
2. W.D. Hudson, *A Philosophical Approach to Religion*, MacMillan, (1974).
3. D.Z. Philips, *Death and Immortality*, MacMillan, (1970).
4. R.C. Gandhi, *Availability of Religious Ideas*, MacMillan, (1976).
5. L. Wittgenstein, *Lectures and Conversations* (ed), C. Barret, O.U.P., (1966).
6. Richard Swinburne, *The Existence of God*, Oxford Publication, (1979).
7. Mircea Eliade, *The Sacred and the Profane*, MacMillan, (1979).
8. Wilfred Cantwell Smith, *Religious Diversity*, MacMillan, (1976).
9. R. Panikkar, *The Intra-Religious Dialogue*, ATE, (1984).
10. Everett L. Worthington, Jr., *Psychotherapy and Religious Values*, Baker Book House, (1993).

Additional Readings:

1. T. Penelhum, *Problems of Religious Knowledge*, (1971).
2. K. Nielson, *Contemporary Critique of Religion*, MacMillan, (1971).
3. P. Tillich, *Systematic Theology* (Vol.I), University Chicago Press, (1951).
4. J. Hick, *Faith and Knowledge*, Cornell University Press, (1966).
5. N. Smart, *The Phenomenon of Religion*, MacMillan, (1973).
6. C.B. Martin, *Religious Belief*, Cornell University Press, (1959).
7. Richard Swinburne, *Faith and Reason*, MacMillan, (1981).
8. Ken Gnanakan, *The Pluralistic Predicament*, TBT, (1992).
9. Sreenivasa Rao, *Inter-Faith Dialogue and World Community*, CLS Publication, (1991).
10. Mircea Eliade, *The Encyclopedia of Religion*, MacMillan, (1987).

Semester – IV

PHIL. 4003

PHILOSOPHY OF NATURAL SCIENCES

UNIT – I : **Distinctive Characteristic of Science and Philosophy of Science:**
- (a) The Nature and Function of Science:
  - (i) Empirical Science
  - (ii) Formal Science
- (b) Nature and Function of Philosophy of Sciences
- (c) Distinction between Science and philosophy of science

UNIT – II : **Logic and pattern of scientific explanation:**
- (a) Deductive explanation
- (b) Probabalistic explanation
- (c) Genetic explanation.
- (d) Teological/functional explanation

UNIT – III : **Laws and Theories.**
(a) Nature of laws and theories
(b) Distinction between laws and theories
(c) Cognitive status of laws and theories.
(i) Descriptivism
(ii) Instrumentalism
(iii)Realism.

UNIT – IV : **Induction and Probability :**
(a) Problem of Induction
(b) Confirmation
(c) Interpretation of Probabilitives:
(i) Frequency Theory
(ii) Classical Theory
(iii)Subjective Theory

Suggested Readings :

1. Feigl, H. Brodbeck, M. (Ed.) *Readings in the Philosophy*, Appleton Century, (1953).
2. Nagel, E. *The Structure of Science*. Routledge and Kegan Paul, (1961).
3. Hempel, C.G. *Philosophy of Natural Science*, Prentice Hall, (1966).
4. Robert Baum, Logic, Holt, Rinehart and Winston, Inc. 1975.
5. Haward Kahane, Logic and Philosophy, Wadsworth Publishing Company, Inc. California, 1973.

Additional Readings :

1. Maddan, E.H. *The Structure of Scientific Thought*, Routledge and Kegan Paul, (1960).
2. Braithwaite, R.P. *Scientific Explanation*, O.U.P. (1953).
3. Frank, P. *Philosophy of Science*. Prentice Hall (1957).
4. Goodman, N. *The Structure of Science*. Harvard University Press, (1954).
5. N. Kahane, *Logic and Philosophy*, Wordsworth, Publishing Company, 1975.
6. Thomas Kuhn, The Structure of Scientific Revaution, University of Chicago Press, Chicago, 1962.
7. Karl Popper, Objective Knowledge, the Clarencon Press, Oxford, 1972
8. Karl Popper, Conjectures and Refutations: Loucon, Routledge and Kegan Paul,1963
9. R Harre, Philosophies of Science, Oxford University Press, Oxford, 1972.

10. John Losee, A Historical Introduction to the Philosophy of Science, Oxford University Press, Oxford, 1972.
11. Buchdahl, G., Metaphysics and the Philosophy of Science, Oxford: Blackwell, 1969.
12. Karl Popper, The logic of Scientific Discovery, New York Basic books, 1959.
13. Bridgman p.w., The logic of Modern Physics, 1927.
14. Karl Popper, The Logic of Scientific Discovery, Hutchinson, 1972.
15. P.K.Feyerabend. 'Explanation, Reduction and Emporicism in Herbert Feigl and G.Maxwell (eds) Minnesota Studies on the Philosophy of Science, University of Minnesota Press, Vol.3, 1962.

Semester-IV

PHIL. 4004

PHILOSOPHY OF HUMAN RIGHTS

UNIT – I : **The Concept of Human Right:**
(a) Origin of the Idea of Human Rights
(b) Human rights versus other rights
(c) Individual, community and Human rights

UNIT – II : **Theories of Human Rights:**
(a) Divine rights theory
(b) Liberalism and Republicanism
(c) Socialist and Marxist theory

UNIT – III : **Declarations and Covenants:**
(a) The Rise of Internationalism
(b) Foundations of the Idea of the United Nations
(c) Politics of Human Rights

UNIT – IV : **Human Rights in Indian Context:**
(a) Foundations of an Indian Constitution
(b) Human Rights, Fundamentalism, Terrorism
(c) Gender, Minorities and Human rights.

Suggested Readings:

1. Micheline R. Ishay (ed.), *The Human Rights Reader*, Routledge, New York, 1997
2. David Boucher and Paul Kelley (eds.), *The Social Contract from Hobbes to Rawls*, Routledge, London, 1994.

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3. Eugene Kamenka and Alice Erh-Soon Tay (eds.), *Human Rights*, Edward Arnold Pub. Ltd., London.
4. Jeremy Waldron, *Liberal Rights*, Cambridge University Press, Cambridge, 1993.
5. Johan Galtung, *Human Rights in another Key*, Polity Press, Cambridge, 1994.
6. Mathew H. Kramer, *Debate over Rights: Philosophical Enquiries*, Clarendon Press, Oxford, 1998.
7. C.J. Nirmal, *Human Rights in India*, Oxford University Press, Oxford, 2000.
8. N. Jayapalan, *Women and Human Rights*, Atlantic Publishers, New Delhi, 2001.
9. B.P. Singh Sehgal, *Human Rights in India: Problems and Perspectives*, Deep and Deep Pub., new Delhi, 1995.
10. M.A. Khan, *Human Rights and the Dalits*, Uppal Pub. House, New Delhi, 1995.
11. P.C. Mehra, *Tribal Rights*, Shiva Publishers, Udaipur, 1996.

Additional Readings:

1. Satish Chandra, *International Documents on Human Rights*, Mittal Publications, New Delhi, 1990.
2. Tim Dunne and Nicholas J. Wheeler (eds.), *Human Rights in Global Politics*, Cambridge University Press, Cambridge, 1999.
3. Ram Ahuja, *Rights of Women: A Feminist Perspective*, Rawat Pub., Jaipur, 1992.
4. Richard Reoch, *Human Rights: the New Consensus*, Regency Press, London, 1994.
5. O. Mandelsohn and Upendra Baxi (eds.), *Rights of the Subordinated Peoples*, Oxford University Press, New Delhi, 1994.
6. Sachchidananda and R.P. Sinha, *Women's Right: Myth and Reality*, Printwell Pub., Jaipur, 1984.
7. *United Nations and Human Rights—1945-1995*, Dept. of Pub. Information, United Nations, New York, 1973.
8. B.P. Singh Sehgal, *Global Terrorism: Socio-Political and Legal Dimensions*, Deep and Deep Pub., New Delhi, 1995.
9. Robin West (ed.), *Rights*, Dartmouth, Singapore, 2001

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Semester – IV

PHIL.4005

APPLIED ETHICS

UNIT – I : **Nature and Scope of Applied Ethics :**
(a) Theoretical Approach : Consequentialism and non-consequentialism
(b) Value of life : human and non human
(c) The Private and public morality

UNIT – II : **Life and Death :**
(a) Pre-natal sex determination
(b) Abortion
(c) Euthanasia
(d) Suicide

UNIT – III : **War and Peace :**
(a) Pacifism, Activism and Selectivism
(b) Conventional war, Nuclear war, Nuclear deterrence
(c) Revolution and counter-revolution

UNIT – IV : **Professional Ethics :**
(a) Medical ethics
(b) Business ethics
(c) Politics and ethics

Suggested Readings:

1. Andrew, Altman, "Pragmatism and Applied Ethics", American Philosophical Quarterly 20 (April 1983) 227.
2. Bernard Gert, : "Licensing Profession", Business and Professional Ethics Journal 1 (Summer, 1982) p.51.
3. Gerald Dworkin, : "Autonomy and Informed Consent", in Medicine and Biomedical Behavioral Research Health Care Decisions Vol.3 (Washington D.C., U.S. Government Printing Office, 1982) pp.63-82.
4. Michael D. : Professional Ethics, Belmont CA Wordsworth, 1981.
5. Alan H. Goldman: The Moral Foundations of Professional Ethics, Totowa N.J. Rowman & Littlefield, 1980.
6. Feinberg Joel (ed): The Problem of Abortion, Belmont CA Wadsworth, 1973.
7. Jane English : "Abortion and the Concept of a Person", Canadian Journal of Philosophy, Vol.2, October, 1975.235
8. Robert Young : "Revolutionary Terrorism, Crime and Morality", Social Theory and Practice, Vol.4, No.3, (Fall 1977) 287-302.
9. Richard A. : On the Morality of War : A Preliminary Enquiry, Stanford Law

Wassertrom Review, ' 59.
10. Peter Winch : Applied Ethics, Oxford University Press, 1986.

11. Anthony Weston : "Drawing Lines : The Abortion Perplex and the presupposition of Applied Ethics". The Monist Vol.67, October, 1984, pp.589.
12. Beauchamp, Tom L. : "On Eliminating the Distinction Between Applied Ethics and Ethical Theory". The Monist, Vol.67, October, 1984, pp.514.
13. Battin, M.P. : "Applied Professional Ethics and Institutional Religion : The Methodological Issues", The Monist Vol.67, October, 1984, pp.569.
14. Bernard Gert, : "Moral Theory and Applied Ethics", The Monist Vol.67, October, 1984, pp.532.

Additional Readings:

1. Alasdair Mac Intyre : "Does Applied Ethics Rest on a mistake?" The Monist Vol.67, October, 1984, pp.498.
2. Virginia Held : *Rights and Goods : Justifying Social Action*, The Free Press, New York, 1984.
3. Paul Wilkinson : "The Laws of War and Terrorism" in the Morality of Terrorism Religious and Secular Justifications eds. David, C. Rapoport and Yonah Alexander, New York Pergamon Press, 1982.
4. ..... : Political Terrorism, Macmillan, London, 1974.
5. Michael Walzer : *Just and Unjust Wars*, New York Basic Books, 1977.
6. Grant Wardlaw : *Political Terrorism*, Cambridge University Press, 1982.

Semester – IV

PHIL. 4006

PHILOSOPHY OF WITTGENSTEIN

UNIT – I : **Philosophy of Language:**
- (a) The Picture theory of Meaning
- (b) The Use theory of Meaning
- (c) The impossibility of Private Language

UNIT – II : **Philosophy of Mind:**
- (a) Sensations
- (b) The Problem of other minds
- (c) On Psychoanalysis

UNIT – III : **Ethics, Aesthetics and Religion:**
- (a) Ethics and Aesthetics in the *Tractatus*
- (b) On Religious belief
- (c) On God, Gospel, Theology and Faith

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UNIT – IV : **Philosophy of Mathematics and Metaphilosophy:**
(a) Mathematical certainty and mathematical generality
(b) The idea of discovery and the limits of mathematical language
(c) **The Role of Philosophy**

Suggested readings:

1. L. Wittgenstein, *Tractatus Logico Philosophicus*, (tr.) D.F.Pears and B.F. McGuinnes, Routledge and Kegan Paul, London, 1961.
2. L. Wittgenstein, *Philosophical Investigations*, 3rd edn., (Ed.) G.E.M. Anscombe, Blackwell, Oxford, 1958.
3. L. Wittgenstein, *Remarks on the Philosophy of Psychology*, vol.I, (Ed.) G.H. von Wright and H. Nyman, (tr.) C.G. Luckhardt and M.A.E. Aue, Blackwell, Oxford,1980.
4. L. Wittgenstein, *Remarks on the Philosophy of Psychology*, vol.II, (Ed.) G.H. von Wright and H. Nyman, (tr.) C.G. Luckhardt and M.A.E. Aue, Blackwell, Oxford,1982.
5. L. Wittgenstein, *Last Writings on the Philosophy of Psychology*, Vol.I, (Ed.) G.H. von Wright and Heikki Nyman, (tr.) C.G. Luckhardt and M.A.E. Aue, Blackwell and Chicago University Press. Oxford and Chicago, 1982.
6. L. Wittgenstein, *Last Writings on the Philosophy of Psychology*, Vol.II, (Ed.) G.H. von Wright and Heikki Nyman, (tr.) C.G. Luckhardt and M.A.E. Aue, Blackwell and Chicago University Press, Oxford and Chicago, 1992.
7. L. Wittgenstein, 'Lecures on Ethics', *Philosophical Review*, 74, 1965, pp.3-26.
8. L. Wittgenstein, *Lectures and Conversations on Aesthetics, Psychology and Religious Belief*, (Ed.) C. Barrett, Blackwell, Oxford,1966.
9. L. Wittgenstein, *Culture and Value*, (Ed.) G.H. von Wright in collaboration with H. Nyman, (tr.) P. Winch, Blackwell, Oxford,1980.
10. L. Wittgenstein, *Remarks on the Foundations of Mathematics*, (Ed.) G.H. von Wright, R.Rhees and G.E.M. Anscombe, rev. edn., Blackwell, Oxford, 1978.
11. L. Wittgenstein, *On Certainty*, (Ed.) G.E.M. Anscombe and G.H. von Wright, (tr.) D. Paul and G.E.M. Anscombe, Blackwell, Oxford,1969.
12. L. Wittgenstein, *Philosophical Grammar*, (Ed.) R. Rhees, (tr.) A. Kenny, Blackwell, Oxford, 1974.

Additional Readings:

1. N. Malcolm, 'Wittgenstein on Language and Rule', *Philosophy*, 64, 1989, pp.5-28.
2. G.P. Baker, 'Malcolm on Language and Rule', *Philosophy*, 65, 1990, pp. 167-179.
3. S.A. Kripke, *Wittgenstein on Rules and Private Language: An elementary exposition*, Harvard University Press, Cambridge, 1982.
4. M. Budd, *Wittgenstein's Philosophy of Psychology*, Routledge and Kegan Paul, London,1989.
5. G. Pitcher, (Ed.) *Wittgenstein: The Philosophical Investigations*, Macmillan, London, 1966.

6. R.L. Arrington and M. Addis (Eds.) *Wittgenstein and Philosophy of Religion*, Routledge, London and New York, 2001.
7. N. Malcolm, *Wittgenstein: A Religious Point of View?*, edited with a response by Peter Winch, Cornell Univrsity Press, Ithaca, New York, 1994.
8. B.R. Tilghman, *Wittgenstein, Ethics and Aesthetics*, Macmillan, London,1991.
9. P. Johnston, *Wittgenstein: Rethinking the Inner*, Routledge, London, 1993.
10. A. Ambrose and M. Lazerowitz, *Ludwig Wittgenstein: Philosophy and Language*, Thoemmes Press, Bristol, 1996.

Semester-IV

PHIL. 4007

PANCADASI

(Selections from the Sanskrit Classics)

UNIT – I : The Text
(a) Upadesasastra
(b) Tarkasastra
(c) Debatable authorship

UNIT – II : Vivekaprakarana (Nature of Reality)
(a) Analysis of Tattva
(b) Analysis of pancabutas
(c) Analysis of pancakosas
(d) Insight of the mahavakyas

UNIT – III : Deepa-prakarana (Nature of Consciousness)
(a) Analogy of the painting (citradipa)
(b) Analogy of the stage (Natakadipa)

UNIT – IV : Anandapancaka (Nature of Bliss)
(a) Yoga-bliss (yogananda)
(b) Self-bliss (atmananda)
(c) Knowledge-bliss (dhyanananda)

Textual Readings:

Pancadasi of Bharatitirtha Vidyarhuya, Text with English translation and Notes by Sri Jnanananda Bharati Svaminah, Madras: Jnanananda Grantha Prakashana Samiti, 1970, Chapters 1, 2, 3, 5, 6, 10, 11, 12, 14.

Additional Readings:

5:2:3(44)

1. Mahadevan T.M.P., *The Pancadasi of Bharatitirtha Vidyaranya*, University of Madras, Madras: 1969.
2. Paul Denssen, *The Philosophy of the Upanisads*, Edinburgh: T.T. Clark, 1979, reprint.
3. A.B. Keith, *The Religion and Philosophy of the Veda and Upanisads*, Mas: Harvard Oriental Series, Cambridge, 1975 reprint.
4. P.T. Raju, *Idealistic Thoughts of India*, Geroge Allen & Unwin Ltd., London :1983.
5. Mahadevan T.M.P., *The Philosophy Advaita*, Luzac & Co., London : 1973 Reprint.
6. Eliot Deutsch, Advaita Vedanta : *A Philosophical Reconstruction*, East West Center Press, Honolulu : 1969.
7. Daniel H.H. Ingalls, "Samkara on the Question: Whose is Avidya?" in *Philosophy of East and West*, 3: 1983.
8. K. Satchidananda Murty, *Revelation and Reason in Advaita Vedanta*, Columbia University Press, New York, 1981.
9. K.S. Ramakrishna Rao, *Advaita as Philosophy and Religion*, Prasaranga Mysore University, Mysore, 1989.
10. Ram Pratap Singh, *The Vedanta of Samkara – A Metaphysics of Value*, Vol.I, Bharat Publishing House, Jaipur, 1989.
11. P.K. Sundaram, *Advaita Epistemology*, University of Madras, Madras, 1988.

(iv) Revised M.A (Education) Syllabus.

The School Board in Humanities & Education in its meeting held on 8th May, 2003 discussed & recommended for submission the revised Syllabus of M.A.Education to the Academic Council after all the suggestions made by the Board were incorporated in the final draft.

The revised Syllabus is placed as Annexure – 'A'.

The matter is placed before the Council for consideration.

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Annexure – 'A'

Department of Education –M. A. Syllabus 2003
NEHU, Shillong

Revised M.A (Education) Syllabus as per UGC model curriculum:

The Revised draft Syllabus for M.A (Education) as per UGC model was approved at the BPGS & School Board with some modifications.

M. A. (Education) shall be two-year programme with four semesters. There shall be 16 Courses: 12 Core Courses including Laboratory Practical and 4 optional courses

Semester I

EC: 101 Advanced Philosophy of Education.
EC: 102 Advanced Psychology of Education
EC: 103 Research Methodology and Statistics in Education
EC: 104 Educational Management and Change

Semester II

EC: 201 Curriculum Development and Instruction
EC: 202 Advanced Sociology of Education
EC: 203 Educational Testing and Evaluation
EC: 204 Environmental Education

Semester III

EC: 301 Educational Technology
EC: 302 Educational Systems in a Comparative Perspective
EC: 303 Optional I (any one of the following)
- 303.01 Economics of Education
- 303.02 Mental Health and Hygiene
- 303.03 Early Childhood Education
- 303.04 Non-Formal and Adult Education

EC: 304 Optional II (any one of the following)
- 304.01 Education for the Gifted and the Creative
- 304.02 Indian Educational Thought
- 304.03 Teacher Education

Semester IV

EC: 401 Laboratory Practical
EC: 402 Higher Education in India
EC: 403 Optional III (any one of the following)
- 403.01 Guidance and Counseling
- 403.02 Education for Empowerment of Women
- 403.03 Education for Rural Development
- 403.04 Experimental Education

EC: 404 Optional IV (any one of the following corresponding to the related course under EC: 304 Optional II)
- 404.01 Education for the Physically and the Cognitively Challenged
- 404.02 Western Educational Thought
- 404.03 Methods of Teaching at Tertiary Level

Note: Students have to select 1 (one) Optional Course each from Optional I under EC: 303 and Optional II under EC: 304, in the 3rd semester. In the 4th semester Optional Courses are to be selected from Optional III under EC: 403 and from Optional IV under EC: 404 (the course to be selected under EC: 404 Optional IV should correspond to the related course under EC: 304 Optional II)

EC: 101. ADVANCED PHILOSOPHY OF EDUCATION

Unit 1. Introduction to Philosophy of Education

- Relationship between Education and Philosophy
- Meaning, nature and scope of Philosophy of Education
- Functions of Philosophy of Education
- Aims of Education in relation to Philosophy of Life
- Aims of Education and the process of Education

Unit 2. Philosophical approaches in Education

- Introduction to Indian Philosophy of Education with special reference to Samkhya, Vedanta, Nayaya, Buddhism, Jainism and Islamic Traditions
- Introduction to Western Philosophy of Education with special reference to Logical Positivism, Existentialism and Dialectical Materialism.

Unit 3. Knowledge and Curriculum

- Meaning, nature and sources of knowledge
- Forms of knowledge
- Philosophical bases of curriculum

Unit 4. Values in Education

- Meaning and nature of values
- Hierarchies of values
- National Values and Education

Unit 5. Social Philosophy of Education

- Freedom, Equality and Democracy

SUGGESTED READINGS

1. Bramel, D. **Patterns of Educational Policy**, Hold Rinehart &Winston, New York. 1971
2. Brown, L. M. **Aims of Education**, Teachers College Press, New York. 1970
3. Brubacher, R. S. **Modern Philosophies of Education**, Chicago University Chicago. 1955
4. Cohen, B. **Means and Ends in Education**, George Allen & Unwin, London. 1983
5. Curtis, S.J. **Introduction to Philosophy of Education**, London University, Tutorial Press. London .1968
6. Dewey, J. **Democracy and Education and Introduction into Philosophy of Education**, The Free Press, New York. 1966
7. Fitzgibbon, R. E. **Making Educational Decision: An introduction to Philosophy of Education**, Harcourt Brace Jovanovich, New York. 1981
8. Kneller, G. F. **Introduction to Philosophy of Education**, John Witty & Sons, New York.1971.
9. Lawton, D. **Class Culture and Curriculum**, Routledge & Regan Paul, London. 1975.
10. McChellan, J.E. **Philosophy of Education**, Prentice Hall Inc, New Jersey. 1976.
11. Morris, V. **Existentialism in Education**, Harper & Row, New York. 1966
12. Mukherjee, R. K. **Ancient Indian Education**, Motilal Banarasidas, 1974
13. Narareth, M. P. **Education Goals, Aims and Objectives**, Vikash, New Delhi. 1984
14. O'Connor, J. **An Introduction to the Philosophy of Education**, Vinod Pustak Mandir, Agra. 1963
15. Pandey, R. S. **An Introduction to Major Philosophies of Education**, Vinod Pustak Mandir, Agra. 1982.

EC: 102. ADVANCED EDUCATIONAL PSYCHOLOGY

Unit 1. Educational Psychology as applied field of Psychology

- Psychology as scientific study of behaviours
- Educational Psychology as applied field
- Scope and nature of Educational Psychology

Unit 2. Intelligence and Creativity

- Theories of Intelligence: Guilford's Structure of Intellect; Cattell's Theory of Fluid and Crystallized Intelligence; Piaget's Theory of Cognitive Development
- Concept and Development of Creativity
- Relationship between Creativity and Intelligence

Unit 3. Motivation

- Meaning and factors affecting Motivation
- Role of Motivation in Learning
- Atkinson's Theory of Achievement Motivation
- Maslow's Self-actualization Theory.

Unit 4. Learning theories and their Educational implications

- Classical and Operant Conditioning Theories
- Kurt Lewin's Field Theory
- Hull's Reinforcement Theory
- Tolman's Sign Gestalt Theory
- Gagne's Hierarchical Theory of Learning

Unit 5. Personality, Mental Health and Adjustment

- Theories of Personality: Psychoanalytical Theory (Freud, Adler and Jung), Carl Roger's Self Theory of Personality
- Role of Home, School and Society in promoting Mental Health
- Adjustment Mechanism and implications for Education

5: 2: 4(6)

SUGGESTED READINGS

1. Atkinson, J.W. & Feather, N.T. — **A Theory of Achievement Motivation**, Wiley Publishers, New York, 1960
2. Bhatnagar S. — **Advanced Educational Psychology**, H.P. Bhargava Book House, Agra. 2002.
3. Chand T — **Educational Psychology**, H.P. Bhargava Book House, Agra. 2002.
4. Crow, R.B. & Crow, A. — **Educational Psychology**, Eurasia Publishing house, New Delhi. (1964)
5. Dececee, J. P. — **The Psychology of Learning & Instruction**, Prentice Hall, New Delhi. (1970)
6. Eysenck, H. J. — **Dimensions of Personality**, Kegan Paul, London. (1947)
7. Gagne, R. M. — **The Conditions of Learning** (2nd edition) Rinehart &Winston New York. (1976)
8. Guilford, J.P. — **The Nature of Human Intelligence**, McGraw Hill, New York. (1967)
9. Hall, C. S. & Lindsey, G. — **Theories of Personality** (3rd Edition), John Wiley, New York. 1978
10. Hilgard, E.O. — **Theories of Learning** (4th Edition), Appleton-Century Crgts, New York.1976
11. Jitendra Mohan — **Educational Psychology**, Wiley, Eastern New Delhi. 1993
12. Kuppuswamy, B — **Advanced Educational Psychology**, Jalandhar University Publications, Jalandhar.1963
13. Maslow, A. — **Motivation and Personality**, Harper & Raw, New York. 1954.
14. Sahoo F.M. — **Psychology in Indian Context**, H.P. Bhargava Book House, Agra. 2002.
15. Woodworth, R.S — **Psychology: A Study of Mental Life**, Century, New York, 1932

EC: 103. RESEARCH METHODOLOGY AND STATISTICS IN EDUCATION

Unit 1. Educational Research, Problem and Proposal

- Methods of acquiring knowledge: tradition, experience, authority, reasoning (deductive and inductive), and scientific method.
- Meaning and scope of Educational Research
- Types of Educational Research: fundamental, applied, and action
- Formulation of research problem
- Hypothesis: characteristics, types, formulation and testing
- Preparation of research proposal

Unit 2. Data Collection and Analysis

- Types of data: Qualitative and Quantitative
- Techniques and tools of data collection
  - (a) Documentary Sources
  - (b) Observation
  - (c) Questionnaires and Schedules
  - (d) Interview
  - (e) Rating Scales and Tests
- Reliability and Validity of tools
- Sampling
  - (a) Population and Sample
  - (b) Methods:
    - (i) Probability Sampling - Random, Systematic, Stratified, Cluster
    - (ii) Non-Probability Sampling- Purposive, Incidental

Unit 3. Methods of Research

Historical Research

- Need and significance
- Sources and collection of data
- Establishing Validity and interpretation of data

Descriptive Research

- Need and importance, steps and interpretation
- Survey studies
- Case study.
- Developmental studies.
- Correlation studies

Experimental Research

- Nature
- Validity-Internal & External
- Role of Control
- Expost Facto Research, Laboratory Experiment,
- Field Experiment
- Designs-Single Group and Parallel Group

Unit 4. Probability Distribution

- Concept of Probability
- Concept of Binomial distribution
- Concept of Normal distribution
- Characteristics of Normal distribution
- Kurtosis and Skewness
- Applications of Normal distribution

Unit 5. Descriptive and Inferential Statistics

(a) Descriptive

Correlation:

- Coefficient of Correlation by Pearson's Product Moment Method for Grouped data
- Partial and Multiple correlations
- Introduction to Regression and Prediction

(b) Inferential Statistics

(i) Parametric Statistics

- Concept of Parameter and Statistics
- Sampling Distribution of Mean
- Standard Error of Mean
- Confidence Intervals and Levels of Confidence for the true mean for
  (a) Large Sample
  (b) Small Sample
- Testing the significance of the difference (t test) between
  (a) Means of two independent large samples
  (b) Means of two small independent samples
- Concept of one-tailed and two tailed tests
- F-Test {One way Analysis of Variance (ANOVA)}

(ii) Non-parametric Statistics

- Concept of non-parametric tests
- Use and computation of Chi-square test

SUGGESTED READINGS

1. Best, J.W. & Kahn, J.V. — **Research in Education,** (6th edition) Prentice Hall of India Pvt. Ltd. New Delhi. 1989
2. Buch, M. B. — **A Survey of Research in Education,** CASE, M. S. University, Baroda, 1974
3. Fox, D. J. — **The Research Process in Education,** Holt Rhinehart and Winston, Inc. New York. 1969
4. Garrett. B. — **Statistics in Psychology and Education**, Vikils, Feiffer & Semen's Ltd, Bombay. 1988
5. Good Barr & Scales — **Methodology of Educational Research**, Appleton Crofts, New York. 1962
6. Guilford, J.P. & Fruchter, B. — **Fundamental Statistics in Psychology & Education**, McGraw Hill, New York. 1974
7. Kerlinger F.N. — **Foundation of Behaviour Research**, Surjeet Publications, Delhi, 1978
8. Kurtz, A. K. & Mayo, S.T. — **Statistical Methods in Education and Psychology,** Narosa Publishing House, New Delhi. 1980.
9. Sax, G. — **Empirical Foundation of Educational Research,** Englewood Cliffs, New Jersey .1968
10. Seigal, Sydne, Y. — **Non-parametric Statistics for Behavioural Science,** McGraw Hill, New Delhi. 1978
11. Singh, Arun Kumar — **Test, Measurement and Research Methods in Behavioural Sciences**, Mc Graw Hill, New Delhi. 1986
12. Sukia S. .P, & Others — **Elements of Educational Research**, (3rd edition), Allied Publishers, Bombay. 1974
13. Tuckman, B.W. — **Analysing and Designing Educational Research,** Harcourt Brace Jovanovich, Inc., New York. 1978
14. Tuckman, B.W. — **Conducting Educational Research** (2nd edition), Harcourt Brace Javanovich, Inc., New York. 1979
15. Van Dalen, D.B & Meyer, W.J. — **Understanding Educational Research,** McGraw Hill C., New York. 1979

EC: 104. EDUCATIONAL MANAGEMENT AND CHANGE

Unit 1. Organizations and their Management

- Organizations: meaning, types and characteristics of Educational Organizations
- Educational Management: development of management thought and practice with special reference to the contributions of Taylor and Fayol; principles of management
- Aspects of Educational Management: planning, organising, supervising and controlling
- Leadership in Educational Organisations: meaning and nature, nature of Leadership
- Styles of Leadership and development of Leadership

Unit 2. Managing Change in Education

- The changing world scenario as background for change, the need towards change population growth, technological and scientific development, educational growth and diffusion of knowledge
- Planning for change: concept and objectives of planned change process
- Approaches to change: Need oriented, people oriented, and task oriented
- The stages of Change Process: awareness, interest, conviction, evaluation, trial, acceptance and adoption (Rogers, Ryan and Gross.)

Unit 3. Personal Management in Educational Organization

- Meaning and scope of personnel management in Educational Organizations
- Dynamics of Human Behaviour: interpersonal behaviour, behavioural norms: code of ethics for students, teachers and administrative staff
- Conflict management: conflict strategy for management of intra-personal, interpersonal and organizational conflicts.
- Professional growth of Educational Personnel: concept of professional growth, factors facilitating professional growth, personnel services, evaluation of professional growth

Unit 4. Resources and their Management in Educational Institutions.

- The concept of systems approach in educational organizations: goals, resources, activities, technology
- Resources and their types: human, physical, financial, instructional, community, and government
- Economic dimensions of resource management: Resource allocation and their efficient use- budgeting: concept, forms, process of budgeting

Unit 5. Modern Techniques in Educational Management and their applications in Educational Organisation

- Programme Evaluation and Review Technique (PERT)
- Planning Programming Budgeting System (PPBS)
- Management by Objectives (MBO)
- Total Quality Management (TQM)

5:2:4(11)

SUGGESTED READINGS

1. Ananda W.P. Gurung — **General Principles of Management for Educational Planner and Administrators**, UNESCO. Paris. 1984
2. Bhagia, H.M. et.al — **Educational Administration in India and Other Developing Countries**, Commonwealth Publication, New Delhi. 1990
3. Bush, T. & Bell L.A. (Eds) — **The Principles and Practice of Educational Management.** Paul Chapman Publishing, Sage publication Company. 2002
4. Flippo,E.B. — **Personnel Management**, McGraw Hill: New York (7th edition) 1984.
5. Fred Luthens — **Organisational Behaviour**, McGraw Hill: International Book Co., Tokyo .1996
6. Goel, S.D. — **Modern Management Techniques**, Deep and Deep, New Delhi. 1987
7. Henleta Telenva & Et.al — **Educational Management: Innovative Global Patterns**, New Delhi. 1997
8. Hostrop, R.W — **Managing Education for Results**, ETC Publication, New Delhi. 1975
9. Kumar A. — **Personal Management, Theory and Practice**, DVS Publication, Guwahati. 2001
10. NIEPA — **Modern Management Techniques in Educational Administration**, Asian Inst. of Educational Planning and administration, New Delhi. 1971
11. NIEPA — **Educational Management in India**, NIEPA, New Delhi. 1986
12. Oberoi P — **Organisation Development**, DVS Publication, Guwahati.2002
13. Tanner D. & Lawrel T — **Supervision in Education Problems and Practices**, McMillan Pub. Co., New York. 1987
14. Thomas, J. Sergiovann et.al — **Educational Governance and Administration**, Prentice Hall, New Delhi.1987.
15. Werral, N — **People and Decision**, Longman London .1980

5:2:4(12)

EC: 201. CURRICULUM DEVELOPMENT AND INSTRUCTION

Unit 1. Introduction to Curriculum Development

- Meaning, nature and purpose of curriculum
- Concept of curriculum development.
- Criteria of curriculum development
- Foundation of curriculum development: Philosophical, Socio-cultural and Psycho-linguistic.

Unit 2.Curriculum Design

- Components and types of Curriculum Design
- Subject-centred, Activity-cum-Experience Centred
- Undifferentiated and Differentiated
- Core Curriculum

Unit 3. Process of Curriculum Development

- Selection of aims and objectives
- Identification, organisation and evaluation of learning activities and experiences

Unit 4. Instructional Materials and Curriculum Transaction

- Text book and allied instructional materials
- Preparation and evaluation of text book
- Analysis of curricular content-designing units, suitable presentation modes
- Teacher as curriculum practitioner
- Instructional Planning for effective teaching

Unit 5. Curriculum Evaluation

- Need for Curriculum Evaluation
- Aspects of Curriculum Evaluation
- Models of Curriculum Evaluation
- Factors influencing change in Curriculum
- Curriculum Research in India

5:2:4(13)

SUGGESTED READINGS

1. Aggarwal. J. Cl — **Curriculum Reform in India:** World Overseas, Doab World Education Series –3, Doab House, Book Seller & Publishers, 1990 Delhi,
2. Brent, Allen — **Philosophical foundations for the Curriculum**, Allen and Unwin, Boston, 1978.
3. Das, R.C. — **Curriculum and Evaluation**, NCERT, New Delhi.1987.
4. Dell, Ronald C. — **Curriculum Improvement: Decision Making & Process**, (6th edition) Allyn & Bacon, Inc., London. 1986.
5. Diamond, Robert M. — **Designing & Improving Courses & Curricula in Higher Education A systematic Approach**, Jossey Bass Inc. Publishers, California.1989
6. Mamidi, Malla Reddey & Ravishankar(eds) — **Curriculum Development & Educational Technology**, Sterling Publishers Private Limited, New Delhi.1984
7. NCERT — **Curriculum & Evaluation**, NCERT, New Delhi. 1984
8. NCERT — **National Curriculum for Elementary & Secondary Education, A Frame Work**, NCERT, New Delhi. 1988.
9. Oliva, Peter F. — **Developing the Curriculum (2nd Edition.)**, Scott, Foreaman & Co. 1983
10. Saylor J. Galen, William Alexander & Arthur J. Lewis — **Curriculum planning for Better Teaching & Learning** (4th edition), Holt Rinehart & Winston, New York.1980
11. Trum J. Lyod. — **Secondary School Curriculum Improvement**, Prentice Hall, New York.1967.
12. Tyler, Ralp. W. — **Curriculum Development: Theory and Practice**, Harcourt Brace, Jovanovich Inc., New York. 1962.
13. Tyler, Ralp. W. — **Basic Principles of Curriculum & Instruction**, The University of Chicago Press, Chicago.1974.
14. UNESCO — **Curricula & Lifelong Education**, Paris, UNESCO.1981
15. Wheeler D.K. — **Curriculum Process**, University of London Press. 1967.

5: 2: 4(14)

EC: 202. ADVANCED SOCIOLOGY OF EDUCATION

Unit 1. Concept and Approaches

- Meaning and scope of Sociology of Education
- Sociological approaches to Education and their limitations
- Sociology of Education in India-status and trends
- Culture as the basis of social behaviour
- Influence of Education on Culture.

Unit 2.Education and Socialisation

- Process of Socialisation, Bandura's theory of social learning
- Agencies of Socialisation- school/college, family, peer group community and mass media
- Development of Self, Self-Concept and Self-Esteem Theories (Cooley, Meed, Erickson and Rogers)
- Socio-Psychological characteristics of students

Unit 3. Social Interactions and their educational implications

- Social groups -process and basis of social interactions
- Typology of social groups: primary, secondary and tertiary groups; formal and informal groups; in-groups and out groups; their educational relevance
- Interpersonal relationships in classroom: classroom climate, organizational climate type, dimensions and educational effects.
- Group dynamics; group cohesion, group conflicts and their resolutions; Sociometry and Guest Who Technique

Unit 4. Education as Social System

- Education as a Social Sub-System
- Education as a factor of Social Stratification and Social Mobility
- Equality of Educational Opportunity and Education for Social Justice and Peace.
- Concept of Community, School-Community relationships
- Community Schools and Colleges and their educational importance.

Unit 5. Education and Social Change

- Social Change: factors and theories of social change
- Forms of Social Change:(with reference to India) Sanskritisation, Industrialisation, Urbanisation, Westernisation and Modernisation
- Role of Education in Modernisation and Social Change

5:2:4(15)

SUGGESTED READINGS

1. Adiseshiah, W.T.V. & Pavanasam. R. — **Sociology in Theory and Practice**, Santhi Publishers, New Delhi. 1974
2. Barry, H. & Johnson, L.V. — **Classroom Group behaviour: Group Dynamics in Education**, John Wiley & Sons, New York. 1964.
3. Blackledge, D. & Hunt, Barry — **Sociological Interpretations of Education**, Groom Helm, London.1985
4. Chandra, S.S. — **Sociology of Education**, Eastern Book House, Guwahati. 1996
5. Cook L, A. & Cook,E. — **Sociological Approach to Education**, McGraw Hill, New York.1970
6. D'Souz A. A. — **The Human Factor in Education**, Orient Longmans, New Delhi. 1969
7. Durkheim, E. — **Education and Sociology**, The Free Press, New York. 1966.
8. Goode & Hatt — **Methods in Social Research**, Mc Graw Hill, Kogakusha, Ltd. Japan.1952
9. Hemlata, T. — **Sociological Foundations of Education**, Kanishka Publishers, New Delhi. 2002
10. Inkeles, A. & Smith — **Becoming Modern**, Hanoman, New York. 1982.
11. Jayaram, — **Sociology of Education**, Rawat, New Delhi. 1990.
12. Mohanty, J. — **Indian Education in Emergency Society**, New Sterling Publishers. 1982
13. Shukla, S. & K. Kumar — **Sociological Perspective in Education**, Chanakya Publication, New Delhi. 1985.
14. Swift, D. F. — **Basic Readings in the Sociology of Education**, Routledge and Kegan Paul, London.1970
15. UNESCO — **Inequalities and Educational Development**, ANIIEP Seminar, UNESCO, Paris.1982

5: 2: 4(16)

EC: 203. EDUCATIONAL TESTING AND EVALUATION

Unit 1. Educational objectives and Educational Evaluation

- Meaning, importance, Levels of Educational Objectives- cognitive, affective and psychomotor domains
- Concept of Test, Measurement and Evaluation
- Purposes of Evaluation
- Summative and Formative Evaluation, Internal assessment, Grading, Question Bank

Unit 2. Validity, Reliability and Norms

- Validity and Reliability of Test
- Factors affecting Reliability
- Relationship between Reliability and Validity
- Meaning and Significance of Norms
- Types of Norms
  (a) Developmental Norms- age norms, grade norms, ordinal scales
  (b) Within Group Norms -percentiles, z scores, T score, and stanine

Unit 3. Achievement Tests and Attitude Scales

- Construction and Standardization of an Achievement test
- Construction of Attitude Scales by Thurstone Method and Likert Method

Unit 4. Intelligence and Aptitude Tests

- Concept of an Intelligence Test and Aptitude Test.
- A study of the following tests
  (i) Standford -Binet Intelligence Scale (original and revised versions.)
  (ii) Wechsler Scales of Intelligence.
  (iii) Differential Aptitude Test (DAT)

Unit 5. Personality Tests and Interest Inventories

- A study of the following tools:
  (i) Thematic Appreciation Test (TAT)
  (ii) Cattell's 16 P.F.
  (iii) Kuder Preference Record

5:2:4(17)

SUGGESTED READINGS

1. Anastasi A. **Psychological Testing** (4th edition), McMillan Pub Co, New York. 1976.
2. Bloom B.S.& Others. **Handbook of Formative and Summative Evaluation of Student Learning**. McGraw Hill Book Co., New York. 1971.
3. Cronbach L J. **Essentials of Psychological Testing** (3rd edition), Harper & Row publishers, New York. 1970
4. Cronbach, Lee J. **Essentials of Psychological Testing**, Harper and Row, International Education, New York. 1964
5. Ebel R. L. & Frisbei D. A. **Essentials of Educational Measurement**, Prentice Hall, New Delhi. 1986
6. Edwards A. L. **Techniques of Attitude Scale Construction**, Feiffer & Simens private Ltd., Bombay. 1975.
7. Freeman F. S. **Theory and Practice of Psychological Testing**, (3rd edition), Oxford & IBH Pub. Co., New Delhi. 1976.
8. Harper (Jr.) A. E. & Harper E.S. **Preparing Objective Examination, A Handbook for Teachers, Students and Examiners**, Prentice Hall of India Private Ltd., New Delhi.199
9. Sax G. **Principles of Educational Measurement and Evaluation**, Woodworth Publishing, California. 1974.
10. Singh (ed). **Criterion – Referenced Measurement**, (selected readings), NCERT, New Delhi. 1990.
11. Tenbrink T .D **Evaluation: A practical Guide for Teachers**, McGraw Hill. Book Company, New York. 1974.
12. Thorndike R.L. & Hagen E. P. **Measurement and Evaluation in Psychology and Education**, (4th edition), John Wiley & Sons, New York.1977.
13. Tuckman B.W. **Measuring Educational Outcome: Fundamental of Testing**, Harcourt Brace Jovanovic, New York. 1975
14. Varma, M. **An Introduction to Educational and Psychological Research**, Asia publishing, New Delhi. 1965
15. Vernon, P.E. **Personality Test and Assessment**, Methuen Co, London. 1962

5:2:4(18) **EC: 204. ENVIRONMENTAL EDUCATION**

Unit 1. Environmental Concepts

- Concept of Environment and Ecosystems.
- Natural System: Earth and biosphere, abiotic and biotic components, bio-diversity, degradation of resource.
- Human Systems: human beings as part of environment, human adaptations to Environment, population and its effect on environmental resources.
- Technological Systems: industrial growth, scientific and technological Inventions and their impact on the environmental systems.

Unit 2. Environmental Degradation

- Environmental Pollution: air, water, and land
- Extinction of Flora and Fauna, Deforestation, Soil Erosion
- Global -Environmental Issues: Ozone Layer Depletion, Green House Effect, Acid Rain
- Need for Conservation, Preservation and Protection of rich environmental heritage
- Problems of Environment with special reference to India

Unit 3. Environmental Education

- Concept, importance, and scope of Environmental Education
- Aims and objectives of Environmental Education
- Distinction between Environmental Education & Environmental Science
- Guiding principles and foundations of Environmental Education
- Special significance of Environmental Education for sustainable development

Unit 4. Curriculum and Methods of Environmental Education

- Interdisciplinary and Multidisciplinary Approach to Environmental Education
- Curriculum of Environmental Education of Primary, Secondary, and Higher Education
- Methods: discussion, seminar, workshop, dialogue, problem solving, field surveys, project, exhibition, interaction with the community and media
- Practical work on Environmental Education
- Teacher preparation strategies for various levels of Education

Unit 5. Evaluation in Environmental Education.

- Objectives of Evaluation in Environmental Education: estimating awareness, understanding, and application of knowledge for protection of environment,
- Tools and techniques: achievement and performance test, attitude and value scales.

5:2:4(19)

SUGGESTED READINGS

1. Agarwal S. K: **Automobile Pollution**, Ashish Publishing House 8/81, Punjabi Bagh, New Delhi. 1991
2. Agarwal S. K. Tiwari Swarnalatha, Dubey P.S.: **Biodiversity and Environment**, APH Publishng Operation, 5; Darya Ganj, New Delhi. 1996.
3. Agarwal. P & Rana S. **Environment and Natural Resources**, Jugmander Book Agency, New Delhi.1986
4. Botkin Daniel B & Keller Edward A. **Environmental Science, Earth a living Planet**, John Wiley & Sons Inc New York. 2000
5. Chauhan I. S. & Chauhan Arun. **Environmental Degradation**, Prem Rawat for Rawat Publications, Jaipur. 1998
6. Gokulanathan Pai P.P (eds). **Environmental Education**, NEHU Publication, Shillong. 2000
7. Gurcharan Singh, Agarwal S. K, Sethi Inderjee **Degrading Environment**. Commonwealth Publishers, New Delhi. 1993.
8. Dhyani S.N. **Management of Environmental hazards**, Vikas Publishing House Pvt. Ltd., New Delhi.1993
9. Hussain Zahid **Environmental Degradation and Conservation in North East India**, Onsons Publications, New Delhi. 1996.
10. Ignasimulther, S. J. **Environmental Awareness & Protection**, Phoenix Publishing House Pvt. Ltd., New Delhi. 1998
11. Ratore, M .S **Environment and Development**, Rawat Publications, Jaipur. 1996.
12. Satapathy Nityananda **Sustainable Development**, Karnavati Publications, Ahmedabad.1997
13. Nanda V. K. **Environmental Education**, Anmol Publication Pvt.Ltd., New Delhi. 1997
14. Sharma, R.K. **Environmental Education**, Surya Publication, Meerut. 1997
15. Sungoh, S.M. **Environmental Education**, Ri Khasi Press. Shillong.2000

EC: 301. EDUCATIONAL TECHNOLOGY

Unit 1. Introduction to Educational Technology

- Meaning, nature, scope and significance of Educational Technology
- Components of Educational Technology -hardware, software
- Systems approach in Educational Technology
- Multimedia approach in Educational Technology
- Evaluation and Educational Technology.

Unit 2. Communication Process

- Concept of Communication Process
- Classroom Communication: verbal and non-verbal communication
- Factors affecting classroom communication
- Observation Schedules of Classroom Interaction
  (a) Flanders's Interaction Analysis Categories System (FIACS)
  (b) Equivalent Talk Categories (ETC)
  (c) Reciprocal Category System (RCS)

Unit 3. Teaching

- Difference between teaching and instruction, conditioning and training.
- Teaching at different levels: memory, understanding and reflective
- Modification of teaching behavior: microteaching and simulation.

Unit. 4. Designing Instructional System

- Formulation of instructional objectives
- Task analysis
- Designing of instructional strategies: lecture, team teaching, discussion, panel discussion, seminars and tutorials

Unit 5. Models of Teaching

- Concept of Models of Teaching
- Essential elements of four families of teaching Models
  a) The Social Interaction (Role Play)
  (b) The Information-Processing (Inquiry training)
  (c) The Personal Models (Non-directive teaching.)
  (d) The Behavioural Systems (Learning self-control)

5: 2: 4(21)

SUGGESTED READINGS

1. Bajpai A. D. & Leedham J.F — **Aspects of Educational Technology Part IV**, Pitman Pub. Co., New York. 1970
2. Bloom B. S.: — **Taxonomy of Educational Objectives, Handbook 1, Cognitive domain**, Longman Group Ltd, London.1974
3. Chauhan S.S. — **A Text Book of Programmed Instruction**, Sterling Publishers Pvt. Ltd., New Delhi.1978
4. Deceeco J. P. — **The Psychology of Learning and Instructional Technology**, Prentice Hall of India, Pvt. Ltd., New Delhi. 1970
5. Flanders N. — **Analysing Teaching Behaviour**, Addison Wesley Pub. Co., London. 1971
6. Goel, A. & Goel S. L. — **Distance Education in the 21st Century.** Deep & Deep Publication, New Delhi. 2000
7. Jose Chander N. — **Management of Distance Education**, Sterling Publishers Pvt. Ltd., New Delhi. 1991.
8. Joyce B. &. Weil M. — **Models of Teaching** (4th edition), Prentice Hall of India Pvt Ltd., New Delhi. 1992
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10. Rastogi, S. — **Educational Technology for Distance Education**, Eastern Book House, Guwahati. 1998
11. Sampath K. — **Instruction to Educational Technology**, (3rd revised Edition), Sterling Publishers Pvt. Ltd., New Delhi. 1992.
12. Sharma R. A. — **Technology of Teaching**, International Publishing House, Meerut. 1991
13. Sharma R. A. — **Programmed Instruction: An Instructional Technology**, International Publishing House, Meerut. 1982
14. Skinner B. F. — **The Technology of Teaching**, Appleton Century Croft, New York. 1968
15. Vashist, S. R. — **Research in Educational Technology**, Eastern Book House, Guwahati. 1997

EC: 302. EDUCATIONAL SYSTEMS IN A COMPARATIVE PERSPECTIVE

Unit 1.Education and Development

- Importance of the study of Educational Systems in a comparative perspective
- Education for Economic, Social and Cultural development
- Factors determining the Educational Systems of a country

Unit 2. Systems of Education in Developed Countries

- Structure and distinctive features of the Systems of Education in
  (a) U.K.,
  (b) U. S .A.,
  (c) Japan
  (d) France

Unit 3. Systems of Education in Third World Countries

- Structure and distinctive features of the Systems of Education in
  (a) China,
  (b) Pakistan,
  (c) Sri Lanka,
  (d) India

Unit 4. Education for Peace and Global Consciousness

- Educational programmes for global consciousness and development, peace, security and environmental protection
- Role played by UN, UNESCO, UNICEF, ACEID, SAARC

Unit 5. Problems prevailing in Third world countries and the role of Education

- Poverty and Population Explosion
- Illiteracy
- Equalisation of Educational Opportunities.
- Political Instability
- Economic Instability

5: 2: 4(23)

SUGGESTED READINGS

1. Andreas, M.K. — **Tradition and Change in Education: A comparative Study,** Prentice Hall, Inc. London 1965
2. Bereday, G.Z.F. — **Comparative Methods in Education,** Oxford and 1134 publishing co., Halt Rinehart, New York. 1967
3. Cramer, J.F.& Browne, G.S. — **Contemporary Education: A comprehensive study of National systems,** Brace and World, Inc. New York, 1965
4. Gezi, K.I. — **Education in Comparative and International Perspective, Halt, Rinehart & Winston, Inc. New York 1971**
5. Hans Collins (ed) — **Comparative Education,** Routledge and Kegan Paul Limited, London. 1964
6. Kalil Gozel — **Educational Comparative and International Perspective,** Halt Rinehart & Winston, Inc. New York. , 1971
7. Kandel, R. L — **Studies in Comparative Education,** Houghton Miffin, Boston. 1933
8. Kenneth, R. K. — **Education in U.S.A,** Alwen Ltd., London, 1956
9. Philip. H. John — **Comparative Education, Purpose and Methods,** University of Greenland Press, Australia 1971
10. Purkait, B.R. — **Modern Education in Japan,** Annol Publications pvt. Ltd. New Delhi.1998
11. Rao, V.K. & Reddy, R.S. — **Comparative Education,** Commonwealth Publishers, New Delhi. 1997
12. Sheodore L. Repler & Edger L. Merphet — **Comparative Educational Administration,** Prentice Hall. Inc., Engwood Cliffs, London, 1962.
13. UNESCO — **Growth and Change: Perspectives of Education in Asia,** Sterling Publishers, New Delhi 1973
14. UNESCO — **International Year Book of education:** Vol. XXXIII, 1981 and XXXV, UNESCO, Paris. 1983
15. UNESCO — **World Problem in Education: A brief Analytical Survey,** UNESCO, Paris 1975.

P 303:01

ECONOMICS OF EDUCATION

Unit 1. Introductory Concepts

- Concept, need, and scope of Economics of Education,
- Relationship between Education and Economics
- Education as an Economic Good, Education as Consumption and Investment, Education as Industry: A critical analysis
- Economic thoughts on Education: Classical, Neo-Classical and Modern

Unit 2. Education, Human Capital and Manpower Planning

- Concept and importance of Human Capital, Peculiarities of Human Capital as Compared to Physical Capital, Schultz's Human Capital Theory of Education and its criticism
- Concept and importance of Human Resources Development. Harbison & Myers's study of composite HRD Index. Process of Human capital formation
- Strategies for developing Human Resource with reference to developing countries
- Need for Manpower Planning
- Techniques of Manpower forecasting
  (a) Employer's Opinion Method
  (b) Goldstein Past Trend Analysis
  (c) Parn's Manpower Output Ratio Method
  (d) International Comparison Method

Unit 3. Education and Economic Development

- Concept of Economic Growth & Development
- Educational pre-requisites for Economic Growth
- Contribution of Education to Economic growth: Critical and Empirical Analysis.
- Relative significance of different levels/types of Education in Economic development (with special reference to India)
- Mobilization and Effective Utilization of Resources for Education

Unit 4. Cost & Benefits of Education

- Social and Private Cost, Opportunity Cost, Unit Cost- Average and Marginal Cost,
- Problems in measuring Educational Cost- Determinants of Educational Cost
- Direct (Social & Private) and Indirect benefits of Education (spill-over and externalities)
- Approaches to Measuring the benefits of Education: Correlation approach, Residual Approach, Rate of Return Approach (i.e. Cost Benefit Analysis), their critical evaluation.
- Criteria for Financing Education

Unit 5. Productivity and Efficiency of Education

- Input- Process – Output Model of Educational Production System
- Productivity of Educational System, Internal and External Productivity,
- Efficiency of Educational System- Internal and External Efficiency
- Education and Agricultural Productivity
- Educational Strategy for Productivity, Efficiency and Development
- Cost-Effectiveness Analysis in Education

5:2:4(25)

SUGGESTED READINGS

1. Ansari, M.M. — **Education and Economic Development**, AIU Publication, New Delhi, 1987
2. Blaug Mark — **Economics of Education & the Education of an Economist** University Press, New York. 1987.
3. Blaug Mark — **An Introduction to Economics of Education**, Penguin Books Ltd. England, 1980
4. Garg, V.P. — **The Cost Analysis in Higher Education**, Metropolitan Book Co.Pvt. Ltd. New Delhi. 1985.
5. Harbison & Myers — **Education, Manpower and Economics growth**, Oxford & IBH. New Delhi, (Indian Edition) 1968.
6. Kneller, G. F. — **Education & Economic Growth**, John Wiley, New York, 1968
7. Nagpal C.S. & Mittal A.C. (eds) — **Economics of Education**, Anmol Publications, New Delhi, 1993
8. Pandit, H. N — **Measurement of cost Productivity & Efficiency of Education**, NCERT, New Delhi, 1969.
9. Prakash Sri. & Choudhury, S. — **Expenditure on Education: Theory, Models and Growth**, NIEPA, New Delhi. 1994
10. Pscharo Pulos, G. & Woodhall, M — **Education for Development- An Analysis of Investment** choices World Bank Publisher, Oxford Univ. Press, 1985
11. Schultz, T. W — **The Economic Value of Education**, Columbia University Press, Columbia, 1963.
12. Sethi, Vinita — **Educational Development and Resource Mobilization**, Kanishka Publication, New Delhi, 1997
13. Sodhi, T. S — **Education and Economics Development**, Mukand Publications, Ludhiana, 1978
14. Tilak, J.B.G. — **Economics of Inequality in Education**, Sage Publications, New Delhi, 1987.
15. Vaizey John — **Economics of Education**, Faber & Faber, London, 1962

OP 303:02

MENTAL HEALTH AND HYGIENE

Unit 1. Introduction to Mental Health and Hygiene

- Concept of Mental Health and illness in historical perspective (Theogenic, Medical, Psychological, Psychosocial and Current)
- Integrated concept of Mental Health and illness, Korchin's five levels of dysfunction
- Concept and objectives of Mental Hygiene

Unit 2. Normality and Abnormality

- Concept of Normality and Abnormality, Classification of Abnormal Behaviour
- Criteria for a Mentally Healthy Person
- Psychoses: nature, types, symptoms and causes
- Neuroses: nature, types, symptoms and causes
- Maladjustment (social, marital, and occupational)

Unit 3. Models of Mental Health Intervention

- Clinical Model: custodial and therapeutic
- Community Model: clinical and Public Health Pole
- Social Action Model
- Defence Mechanisms

Unit 4. Psycho- Therapies and Psychiatric Techniques

- Concept, goals, and approaches of Psychotherapies
- Salient features and techniques of Hypnosis and Psycho-analysis
- Carl Roger's Humanistic Therapy
- Existential Psychotherapy
- Kelly's Cognitive Psychotherapy
- Behaviour Therapies: Systematic Desensitization and Aversive Conditioning
- Psychiatric Techniques: Shock Therapy

Unit 5. Education and Mental Health

- Factors affecting Mental Health (Home, Society and School Factors)
- Role of Home, Society and School in maintaining good Mental Health
- Principles of good Mental Health
- Relaxation and Meditation for maintaining good Mental Health

SUGGESTED READINGS

1. Brown, J. F — **The Psychodynamics of Abnormal Behaviour**, Mc Graw Hill Book Co. 1940
2. Caroll, H. A. — **Mental Hygiene**, Prentice Hall, New York.1979
3. Chauhan, J.C. — **Mental Hygiene**. Allied publisher, New Delhi 1986
4. Coleman, J.C. — **Abnormal psychology and Modern Life**, D.B. Taraporewals and Co- (P) Ltd.1969
5. Crow,I.D. & Crow A. — **Mental Hygiene**, McGraw Hill Book Co. New York. 1970
6. Cyril M.F. — **Behavior Therapy**, Mc Graw Hill Book New York. 1969
7. Dollard J & Miller N.E. — **Personality and Psychotherapy**, Aldine, Chicago. 1970
8. Bhan, S. & Dutt, N.K. — **Mental Health through Education**, Vision Books Pvt Ltd.New Mental Hygiene Delhi, 1986
9. Enelow Allen J. — **Elements of Psychotherapy**, Oxford University Press, New York.1978
10. Jahoda M. — **Current Concepts of Positive Mental Health**, Basic Books inc. New York, 1958
11. Klein, D.B. — **Mental Hygiene**, Henery, Holt and Company, 1956
12. Korchin S.J. — **Modern Clinical Psychology**, Indian Edition. CBS, Publishers and Distributors, New Delhi. 1986
13. Maurus, J — **Mental Hygiene**, Better yourself Books, Allahabad.1976.
14. Page, J.P. — **Abnormal Psychology**, Tata Mc Crow Hill pub. Comp LTD. New Delhi Indian edition, 1970
15. Rayan W. Carson — **Mental Health through Education**, Common wealth, New Delhi. 1970

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EARLY CHILDHOOD EDUCATION

Unit 1. Introduction to Early Childhood Education

- Need, importance and objectives
- Methods of Child Study
- Significance Child Rearing Practices & Learning
- Development of Pre-School Education in India

Unit 2. Contributions of Philosophers and Educationists to Pre-School Education

- Jean Jacques Rousseau
- Frederich Wilhelm August Froebel
- Maria Montessori
- Mahatma Gandhi
- Tarabai Modak

Unit 3. Different Aspects of Child Development

- Physical Development
- Emotional Development
- Social Development
- Cognitive Development
- Language Development

Unit 4. Pre-School Education

- Activities and Programmes for Pre-School Education
- Characteristics of a balanced Pre-School Curriculum
- Planning of Pre-School Curriculum
- Evaluation of Pre-School Curriculum and its activities

Unit 5. Methods, Programmes and Trends of Early Childhood Education

- Nursery, Balawadi, Anganwadi and Day care programmes and activities
- Agencies conducting Pre-Schools and their management (Central Social Welfare Board, State Social Welfare Board, Indian Council for Child's Welfare etc)
- Trends and researches of Early Childhood Education

SUGGESTED READINGS

1. Aggarwal, J.C. **Methods and materials of Nursery Education**, Doaba House, Delhi. 1990
2. Burgers, E. & Locke, H.J. **The Family**, American Book Co., New York.1953.
3. Day Barbara **Early Childhood Education: Organising Learning Activities**, McMillan, New York, 1983
4. Dutt, N.K. **Psychological Foundations of Education**, Doaba House, Delhi, 1974.
5. English, H.B. **Dynamics of Child Development**, Holt, Rinehart and Winston, 1961. New York,
6. Grewal, J.S. **Early Childhood Education**, National Psychological Corporation, Agra. 1984
7. Hurlock, E.B. **Developmental Psychology**, Tata McGraw Hill Publishing Co., Bombay. 1968.
8. Kendler, H.H. Kendler, T.S. **Basic Psychology**, Appleton Century Crofts, New York 1971.
9. Nedinnus, G.R. & Johnson, R.C **Child Development and Personality**, Harper and Row Publishers, New York.1974.
10. Pollard, M. B. & Geoghegan, B. **The Growing Child in Contemporary society**, The Bruce publishing Co., Milwakes.1969
11. Sebald, H. **Adolescence – A social Psychological analysis**, The McMillan Company, London. 1970.
12. Spoked, B. L. (Ed): **Handbook o0f Research in Early Childhood Education**, The Free Press, New York.1982.
13. Stone, J.L.& Church, J. **Childhood and Adolescence**, Random House, New York. 1957
14. Travers, J.E. **The Growing Child. Introduction to Child Development**, John Kluey, New York. 1977
15. Winch, F.R. **The Modern Family**, New York: Holt, Rinehart and Winston Inc., 1971

5:2:4(30)

OP 303:04

NON-FORMAL AND ADULT EDUCATION

Unit I. Introduction to Nonformal and Adult Education

- Meaning, nature and scope of Non-formal Education and Adult Education
- Aims and Objectives of Non-formal and Adult Education

Unit 2. Curriculum Development for Non-formal and Adult Education

- Content and Materials for Non-formal and Adult Education
- Methods, Techniques and Strategies of Instruction
- Monitoring and Evaluation

Unit 3. Non-formal and Adult Education for Development

- Aspects of Development- Economic, Social and Cultural
- Agencies of Non-formal and Adult Education - Government and Non-Government
- Role of Universities
- Evaluation and Follow-up of Non-formal and Adult Education

Unit 4. Problems of Non-formal and Adult Education

- Materials
- Personnel and Motivational aspect
- Organisation and Administration

Unit 5. Modern Trends in Non-formal and Adult Education in India

- Mass Media
- National Literacy Mission
- Total Literacy Campaign
- Education for All

5:2:4(31)

GESTED READINGS

1. Bordia Anil (ed) — **Adult Education in India**, Indian Adult Education Association, New Delhi. 1982
2. Brookfield Stephen, D. — **Training Education for Adults**, Routledge, London 1988
3. Chopra R. — **Adult and Non-Formal Education**, International Book House, New Delhi, 1998
4. Datta S.C. — **Adult Education in Third World**, Criterion Publications, New Delhi. 1987.
5. Mohsini S.R. — **Adult and Community Education**, An Indian Experiment, Adult Association, New Delhi.1973
6. Mohsini S.R. — **History of Adult Education in India**, Anmol Publication, New Delhi.1989.
7. Pillai R. — **Nonformal Education**, Bhargava Book House, Agra, 2002
8. Prasad, P.S. — **Adult Education**, Asian Publishing House, New Delhi. 1989
9. Rao V.K & Reddy R.S. — **Adult and Non-Formal Education**, H.P. Bhargava Book House, Agra, 1999
10. Sharma R.P. — **Non-Formal Education for Development**, Bhargava Book House, Agra, 2002
11. Singh D.R. — **Studies in Adult and Non-Formal Education**, (3 Vols) H.P. Bhargava Book House, Agra, 2001
12. Smith R.M. — **Handbook of Adult Education**, McMillan Publishing, New York. 1970
13. Styler W.E. — **Adult Education in India**, Oxford University Press, New York. 1966.
14. Townsend E.K. — **Adult Education in Developing Countries**, (2nd Edition), Pergamon Press, Oxford, New York. 1977.
15. Youngman Frank — **Adult Education and Socialist Pedagogy**, Croom Helm, London 1986

OP 304:01

EDUCATION FOR THE GIFTED AND THE CREATIVE

Unit 1. Education of the Gifted.

- Concept of Giftedness, types and characteristics of the Gifted
- Factors promoting giftedness and its development
- Identification of the gifted children, methods and techniques
- Problems related to social, emotional and educational adjustment

Unit 2. Education of the Creative

- Creativity, nature, characteristics and components of Creativity, factors fostering Creativity
- Theories of Creativity and Development of Creativity Models and Techniques
- Identification of the Creative Children, different measures of Creativity Test:(Torrance, Baquer Mehdi, and Passi's test
- Factors fostering Creativity, classroom conditions for nurturing and stimulating Creativity

Unit 3. Approaches to Education of the Gifted and the Creativity

- Objectives of special education schemes for the Gifted and the Creative
- Educational practices and approaches, grouping, acceleration, enrichment-individualized instructions, motivating the gifted, self-learning and tutorials their merits and limitations
- Curricular modifications for the Education of the Gifted and the Creative

Unit 4. Special Education for the Gifted and the Underachievers

- Bright Under Achievers their characteristics and causes and remedial programmes.
- Remedial Programmes for the Gifted and the Under Achievers

Unit 5. Guidance and Counselling for the Gifted and the Creative

- Need for Guidance and Counselling
- Process of guiding the Gifted and the Talented
- Role of teachers, parents and community agencies in guiding the Gifted and the Creative

SUGGESTED READINGS

1. Bruer, A.M. & Shea, M — **Teaching Exceptional students in your classroom**, London, Allyn and Bacon, 1989
2. Chauhan, S.S. — **Education of Exceptional Children**, Indus Publishing Company, New Delhi, 1987
3. Cruick Shank M.M. and Johnson (eds) — **Education of Exceptional Children and Youth**, London, McGraw Hill, 1975.
4. Desmukh. — **Creativity in Classrooms**, S. Chand and Co. New Delhi, 1984
5. Gallagher J.J. — **Teaching the Gifted Child (2nd edition.)**, Boston, Allyn & Bacon, 1975
6. Heck, A.O. — **The Education of the Exceptional Children**, McGraw Hill, New York, 1953
7. Hewett, F.M. — **Education of Exceptional Learners**, Allyn and Bacon Inc. London, 1977.
8. Kirk, S. & Gallalagher. — **Education of the Exceptional Children**, Oxford IBH, New Delhi 1979
9. Laycock, S.R. — **Gifted Children**, Copp Clark Publishers, Toronto 1957.
10. Lindsay M. — **Training teachers of the Gifted and Talented**, Teachers College Press. New York, 1980
11. Sumpton & Lucking. — **Education of the Gifted**, Ronald Press, New York, 1960
12. Torrance & Myers. — **Creative Learning and Teaching**, Dodd Mead Publications, New York, 1970
13. Torrance,E. P. — **Guiding Creative Talent**, Prentice Hall, New Delhi, 1970.
14. Wards, V.S. — **Educating the Gifted**, Ch.E. Merrill Book Company, Columbia, Ohio, 1961
15. Whitemore, J.R. — **Giftedness, Conflict and Underachievement**, Allyn and Bacon, Boston.1980

5:2:4(34)

OP 304:02

INDIAN EDUCATIONAL THOUGHT

Unit 1. Vedic Education Brahmanic Educational Thought

Unit 2. Buddhistic Educational Thought

Unit 3. Islamic Educational Thought and Sufism in Education

Unit 4. Influence of Western thought on Modern Indian Educational System and Practices

Unit 5. Views on Education of the following Indian Educational Thinkers

- Raja Ram Mohan Roy.
- Vivekananda.
- Aurobindo Ghosh.
- J. Krishnamoorthy
- Radhakrishnan

SUGGESTED READINGS

1. Adhedananda, **Ideal of Education**, Ram Khrishna Vendan Publishers, Calcutta, 1945
2. Aurobindo, S. **A System of National Education**, Arya Publishing House, Calcutta, 1946
3. Bakshi, S.R.& Mahajan, L. **Education in Ancient India**, Deep and Deep Publications, Pvt. Ltd. New Delhi. 2000
4. Balsara, M **Education Policy and Development**, Kanishka Publishers & Distributors, New Delhi. 1996
5. Chaube, S.P. **Recent Educational Philosophies**, Indian, Vinod Pustak Mandir, Agra, 1972
6. Chaube, S.P. **Education in Ancient and Medieval India**, Vikas Publishing House, Pvt. Ltd. New Delhi.1999.
7. Dikshit, S.D. **Education, Nationalism and India**, Sterling Publishers, Delhi, 966
8. Dubey, S.N. **Education Scenario in India**, Author Press, Delhi. 2001
9. Ghosh, S. **Education in Modern India**, Orient Longman Ltd, New Delhi. 995
10. Keay, F.E. **Ancient Indian Education**, Cosmos Publication, New Delhi, 992.
11. Mookerji, R.K. **Ancient Indian Education** (Brahmanical & Buddhist), Motilal Banarsidas, Reprint Delhi, 1974
12. Ramchandani, S. **Great Thoughts on Education**, DVS, Publishers and Distributors, Guwahati. 2002
13. Safaya, R.N. **Great Indian Educators**, The Associated Publishers, Ambala Cantt. 1993.
14. Sharma, S.R. **Educational Development in India**, Anmol Publishers, New Delhi. 1990
15. Ziauddhin A.S.M. **Muslim Educational Thought in India**. Atlantic Publishers & Distributors, New Delhi. 1988

OP 304:03

TEACHER EDUCATION

Unit 1. Introduction to Teacher Education

- Meaning and scope of Teacher Education
- Need for Education of Teachers.
- Aims and objectives of Teacher Education at elementary, secondary and higher secondary levels.
- Development of Teacher Education in India before and after independence
- Agencies of Teacher Education- NCTE, NCERT, SIE, SCERT, DIET

Unit 2. Teacher Education Programmes.

- Pre-service Teacher Education – organisation, types, NCTE curriculum framework objectives, content methods and evaluation at various levels.
- In-service Teacher Education -- needs, objectives, types, organisation and evaluation.
- Comprehensive Teacher Education Programme.
- Integrated Teacher Education Programme.

Unit 3. Techniques of Teacher Education.

- Interaction Analysis.
- Simulation.
- Microteaching.
- Programmed Learning

Unit 4. Student Teaching.

- Role of student teaching in Teacher Education Programme.
- Organisation of student teaching; various patterns: block-teaching, internship, integrating theory and practice.
- Supervision and evaluation of student teaching

Unit 5. Professionalism in Teacher Education & Research in Teacher Education

- Teaching as a profession, professional ethics of a teacher.
- Professional organizations for various levels and their roles.
- Performance appraisal of teachers.
- Trends of research in Teacher Education in India

SUGGESTED READINGS

1. Anand, C.L. — **Aspects of Teacher Education**, S. Chand and Co., Delhi. 1988
2. Govt. of India. — **Report of the Education Commission**, 1963-1966, Ministry of Education, Govt. of India, New Delhi, 1966
3. Grower, R. & Walters S. — **Teaching Practice Handbook**, ELBS, Heinemann Educational Books Ltd., London, 1987
4. Meffit, John Clifton — **In-service Education for Teachers**, Washington the centre for Applied Research in Education, INC., 1983
5. Mukherjee, S.N. — **Admission and Organisation in Teacher Training Institutions**, NCERT, New Delhi. 1987
6. Mukherjee, S.N.(ed) — **Education of the Teacher in India**, Vol. I & Vol. II, S. Chand nd Co. Delhi.1988.
7. NCTE — **Teacher Education Curriculum- A Framework**, NCERT, New Delhi.1978
8. Passi, B.K. — **Becoming a Better Teacher, Microteaching Approach**, Sahitya Nudranalaya, Amedabad. 1976
9. Singh, L.C. (ed) — **Teacher Education In India- A resource Book**, NCERT, New Delhi. 199
10. Subramanyam, K. — **Handbook for College and University Teachers**, 82/SRT, Balapet, Hyderabad. 1995
11. Tibble, J.W.(ed) — **The Future of Teacher Education**, Routledge and Kegan Paul, London.19
12. Pareek, R. — **Role of Teaching Profession**, Eastern Book House, Guwahati. 996.
13. Raina, V.K. — **Teacher Education: A Perspective**, Eastern Book House, Guwahati. 19
14. Silcork, P. Bruntland, M. — **Acaieving Competence, Success and Excellent in Teaching**, Routledge Falmer. 2002.
15. Panda, B.N. & Tewari, A.D. — **Teacher Education**, A.P.H. Publishing Corporation, New Delhi. 997.

EC: 401. LABORATORY PRACTICALS

Minimum of 6 experiments and 6 tests to be completed:

Experiments	Tests
1. Learning	Creativity
2. Reaction Time	Intelligence
3. Attention	Interest
4. Concept Formation	Adjustment
5. Memory	Motivation
6. Association	Personality
7. Classroom Interaction	Aptitude
8. Sociometry	Altitude
9. Psycho-physical	Reading Comprehension
10. Sensation and Perception	Aspiration

Evaluation Scheme

Sessional = 25

Semester Exam = 75 (30 for Experiment & 30 for Test, 15 Viva Voce)

SUGGESTED READINGS

1. Anastasi, A. — **Psychological Testing**, Macmillan, New York. 1976
2. Collins Mary & Drever James — **Experimental Psychology**, Gayatri Offset Press, New Delhi. 1976.
3. Cronbach L J. — **Essentials of Psychological Testing** (3rd edition), Harper & Row publishers, New York.1970
4. Das, P.C. — **Experiment and Measurement in Education and Psychology**. Published by A.B. Das, Gauhati University, Guwahati. 2000
5. Ebel R. L. & Frisbei D. A. — **Essentials of Educational Measurement**, Prentice Hall, New Delhi. 1986
6. Fox Charles — **A Textbook of Practical Psychology**, Akansha Publishing House, New Delhi.2001
7. Freeman, F.S. — **Psychological Testing**, Holt Rinehart, New York. 1962
8. McGuigan. — **Experimental Psychology**, Prentice Hall of India, New Delhi. 990
9. Parameswaran — **Experimental Psychology**, Allied Publishers, Bombay.1984.
10. Postman Leo & Egan J.P — **Experimental Psychology**, Kalyani Publishers, Ludhiana. 949
11. Saikia, Lutfun R. — **Psychological and Statistical Experiments in Education**, Deptt of Education, Gauhati Univ. Guwahati, 1997.
12. Travers, R.M. — **Educational Measurement**, Macmillan, New York. 1955
13. Tuckman B.W. — **Measuring Educational Outcome: Fundamental of Testing**, Harcourt Brace Jovanovich, New York. 1975
14. Vernon, P.E. — **Personality Test and Assessment**, Methuen Co, London. 1962
15. Woodworth, R.S. — **Experimental Psychology**, Methuen, London. 1945

EC: 402. HIGHER EDUCATION IN INDIA

Unit 1. Introduction to Higher Education in India

- Meaning and goals; structure of Higher Education;
- Constitutional provision regarding Higher Education
- Policy perspectives and emerging trends in Higher Education.

Unit 2. Higher Education in a historical perspective

- Modern Higher Education in India- the Despatch of 1854 and subsequent development during the British Period
- Development of Higher Education in Free India, commission and committee reports.
- National Policy on Education 1986,1992 (Revised)
- Economic Reforms and Higher Education

Unit 3. Planning and Management of Higher Education

- Bodies involved: Ministry of Human Resource Development/Education, Planning Commission and Planning Boards
- University Grants Commission
- Association of Indian Universities
- IGNOU and its role in open education
- National Assessment and Accreditation Council
- Managing an Institution of Higher Learning
- Financing of Higher Education – sources, management of finances- issues in financing of Higher Education

Unit 4. Curriculum in Higher Education

- Curriculum Planning
- Curriculum Development
- Curriculum Transaction
- Curriculum Evaluation

Unit 5. Higher Education in India- Issues and Problems

- Higher Education and Socio-Economic development
- Quality Vs Quantity in Higher Education- considerations
- Autonomy in Higher Education
- Innovations in Higher Education
- The Emerging professional role of teachers in Higher Education institutions
- Research in Higher Education in India

5:2:4(41)

SUGGESTED READINGS

1. Amrik Singh & Philip G. A. — **The Higher Learning in India**, Vikash Publishing Home Pvt., Ltd., Delhi. 1974
2. Amrit Lal Vohra & Sharma S.R. — **Management of Higher Education in India**, Anmol Publications, New Delhi.1990
3. Dongerkery, S. R. — **University Autonomy in India**, Lalxani, Bombay. 1967
4. Dongerkery, S. R. — **University Education in India**, Manaktabs, Bombay. 1967
5. Garge, V. P. — **Financing Higher Education, Scope & its Limits**, Radha Publication, New Delhi .1976.
6. Mathur, M. V. & Others — **Indian University System-Revitalization and Reforms**, Wiley Eastern D Limited, New Delhi, 1994
7. Moonis Raza (ed) — **Higher education in India, Retrospect and Prospect**, Association of Indian Universities, New Delhi. 1991.
8. Naik, J. P. — **Educational Planning in India**, Allied Publishers, Bombay, 965
9. Naruallah Syeed & Naik, J.P. — **A Student History of Education in India**, MacMillan, Bombay.1972.
10. Philip Altback — **Comparative Perspective on the Academic Profession**, Praeger, New York. 1985
11. R. S. Sharma — **Higher Education, Scope & Development** Commonwealth Publishers, New Delhi.1995.
12. Ranph G. Lewis & Douglas H. Smith — **Total Quality in Higher Education**, Vanity book, International, New Delhi.1998.
13. Ravi Mathai — **The Rural University**, Popular, New Delhi. 1985.
14. Reddy, G.R. — **Higher Education in India**, Sterling Publishers, New Delhi, 199?
15. UGC — **Development of Indian Higher Education in India**, New Delhi. 1992

OP 403:01

GUIDANCE AND COUNSELLING

Unit 1. Introduction to guidance

- Meaning, nature and scope of Guidance, need for Guidance
- Principles of Guidance
- Historical development of Guidance & Counseling movement with special reference to India
- Nature scope and functions of each of the following: - Educational Guidance, Vocational Guidance, Personal Guidance, Social Guidance
- Group Guidance- need, scope with special reference to Educational Institutions

Unit 2. Counselling

- Nature and principles of Counselling
- Approaches to Counselling – directive, non-directive, eclectic, role and functions of Counsellor,
- Professional Education of the Counsellor

Unit 3. Techniques of collecting information for guidance

- Testing Techniques- types of tests used in Guidance
- Tests of Intelligence: Aptitude, Interest, Achievement and Personality
- Uses and limitations of testing techniques in Guidance
- Non-testing techniques: observation, questionnaire, rating scale, interview anecdotal cumulative record, case study

Unit 4. Guidance Service

- Organisation of Guidance Services in schools and colleges
- Types of organisation: centralized form, decentralized form, mixed form
- Individual Information service: types of data to be collected about the individual student, sources of information
- Occupational information service: types of information materials, sources, methods of classifying and disseminating occupational information
- Placement Service: Educational Placement, Vocational Placement
- Evaluation of Guidance Programme, Follow-up Service

Unit 5. Trends in Guidance and Counselling

- Guidance for special groups
- Trends of researches in Guidance and Counselling in India

SUGGESTED READINGS

1. Bengalee, M.D. — **Guidance and Counselling**, Sheth Publishers, Bombay. 1984
2. Bhattacharya — **Guidance In Education**, Asian Publishing House, Bombay. 1964.
3. Bernard, H. W. & Fullner, D.W — **Principles of Guidance, A basic test (Indian Education)**, Allied Publishers Pvt.Ltd, New Delhi. 1987.
4. Cronbach, Lee — **Essentials of Psychological Testing**, Harper & Row, London. 1964
5. Crow, L.D. & Crow, A — **An Introduction to Guidance**, American Book, Co., New York. 1951
6. Fuster, J.M. — **Psychological Counselling in India**, McMillan and Co., Ltd., Bombay. 1964
7. Jayaswal S. — **Guidance and Counselling**, Prakashan Kendra, Lucknow. 1981
8. Kochhar, S.K — **Guidance in Indian Education**, Sterling Publishers Pvt.Ltd., New Delhi. 1979.
9. Mathewson, Robert, H. — **Guidance Policy and Practice**, Harper and Row, New York. 1962
10. Pasrisha Prem & Screck, Thomas C. — **A Handbook for Developing Guidance Services in Secondary Schools**, M.S. University, Baroda. 1964
11. Pasrisha Prem. — **Guidance and Counselling in Indian Education**, NCERT, New Delhi. 1976
12. Swamy R.V.(ed). — **Guidance Service in Colleges and Universities**, Bangalore University and Directorate of Employment and Training, Bangalore. 1971
13. Vaugh, T. D. — **Educational and Vocational Guidance Today**, Routledgeki and Kegar Paul, London. 1970
14. Wadhwa, Khurshid A & Rohela Pritam K. — **Guidance Services in Schools**, Albio Press, New Delhi. 1964
15. Williamson E.G. — **Student Personnel Services in Colleges and Universities**, McGraw Hill, Book, Co, inc., New York. 1961

OP 403:02

EDUCATION FOR EMPOWERMENT OF WOMEN

Unit 1. Introduction to Women's Empowerment

- Concept of Women's Empowerment
- Women's Empowerment in Today's World
  (a) Global Gender Gaps
  (b) Women's Right
  (c) Women's Movements

Unit 2. Status of Women's Empowerment

- Health conditions
- Education
- Work related issues
- Political participation
- Economic conditions
- Social conditions
- Future Progress for Women: Reshaping Globalization

Unit 3. Education for Women's Empowerment

- Approaches to Women's Education
- Education for achieving quality of life, equality of opportunities, and equity.

Unit 4. Roles of Women in Empowerment

- Women in developing countries with special reference to India
- Women in National Development
- Women in Decision Making

Unit 5. Injustice against Women and Solutions

- Domestic front, violence, rape, prostitution, existing prejudices, women's divorce and family planning
- Suggested Measures
- Role of formal and non-formal agencies, political parties, NGO's and media

SUGGESTED READINGS

1. Agrawal, S.P — **Women's Education in India**, Eastern Book House, A. T. Road, Shantipur, Guwahati. 2001.
2. Andal, N. — **Women and Indian Society: Options and Constraints**, DVS Publishers, Guwahati. 2002.
3. Arya Sadhna — **Women, Gender Equality and the State**, Deep & Deep Publications, Pvt. Ltd., F-159, Rajouri Garden, New Delhi. 1999.
4. Bakshi, S.R. — **Empowerment of Women and Politics of Reservation**, DVS Publishers, Guwahati. 2002.
5. Dakshi, S.R. — **Welfare and Development of Women**, Deep & Deep Publications Pvt., Ltd., F-159, Rajouri Garden, New Delhi. 1999.
6. Gupta Mukta — **Women and Educational Development**, DVS Publishers, H.B. Road, Pan Bazar, Guwahati. 2000.
7. Gupta, N.L. — **Women Education through ages**, Eastern Book House, A.T. Road Shantipur, Guwahati. 2000
8. Jayapalan, N. — **Women and Human Rights**, DVS Publishers, Guwahati. 2002.
9. Joshi, S.T. — **Women and Development-The Changing Scenario**, Mittal Publications, Daryaganj, New Delhi, 1999.
10. Menon Latika — **Women Empowerment and Challenge of Change**, Kanishka Publishers, A Ansari Road, Daryaganj, New Delhi, 1998.
11. Narasimhan Sakuntala — **Empowering Women**, Sage, Publication India Private Limited, Post Box 4215, New Delhi.1999
12. Ranganathan Sarala — **Women and Social order: A Profile of Major Indicators and Determinants**, Kanishka publishers, Distributors 4697/5-21 A Ansari Road, Daryaganj New Delhi. 1998.
13. Seth Mira — **Women and Development**, Sage Publications, India Private Limited, Post Box 4215, New Delhi.2001
14. Singh, U.K. — **Women Education**, Book Men Associates, 9 Opp. Rajasthan University, Jawahar Lal Nehru, Marg Jaipur. 2000
15. Suresh Dutt. — **Women and Education**, Anmol Publications, Pvt. Ltd., 4374/4, Ansari Road, New Delhi 2000

OP 403:03

EDUCATION FOR RURAL DEVELOPMENT

Unit 1. Rural Education and Rural Development

- Concept, need, importance and objective of Rural Education
- Types of Rural Education
- Programmes for Rural Development

Unit 2. Educational Programmes for Rural Development

- Basic Education
- Work Experience, Socially Useful Productive Work (SUPW)
- Vocational Education for rural areas
- Integrated Rural Development Programme (IRDP)
- Adult Education Programme

Unit 3. Role of Educational Institutions in Rural Development

- Schools, College and Universities
- Availability and accessibility of Schools in rural community
- Types of Schools (single teacher, two/three teacher Schools)
- Nature of rural school curriculum
- Co-curricular activities and its problems
- Schools as a community centre
- School teachers as rural leaders.
- Leadership training programme such as workshop forum, discussion, field trips.

Unit 4. Role of other agencies in Rural Development

- Role of voluntary organisation
- Role of local bodies in Education
- Non-formal Education programmes for rural areas
- Role of the various Mass Media promoting Education in rural areas: T. V., Radio, Movies, Theatre, Clubs, Exhibition, Newspapers, Periodicals and Magazines etc.

Unit 5. Aspects of Rural Development

- Education as an investment in Human Resource Development
- Equality of Educational Opportunities
- Education as an Instrument of Change in rural areas
- Economic and Non-Economic factors affecting rural development

SUGGESTED READINGS

1. Chickermane, D. V. **Experiments in Rural Education**, Gokarne, Karnataka, 1978
2. Govinda, R. **School Education in Rural Areas, Society for educational research, and development**, Baroda, 1987
3. Govindappa, K. **Adult Education; Impact of National Literacy Mission**, Eastern Book House, Guwahati. 1998
4. Hushier Singh. **Rural Development in India**, New Delhi
5. John, A. Dawson & John C. D. **Evaluating the Human Environment Essays in Applied Geography** London, 1985(Reprint)
6. Lonis Malassis. **The Rural World, Education and Development**, UNESCO Press, Paris. 1976
7. Lyer, G. **Rural Transformation in India**, DVS, Guwahati. 2001
8. Maheshwari, S, **Rural Development in India. A Public Policy Approach, Centre for Political Approach**, Centre for Political and Administrative, New Delhi. 1995
9. Mohsini, A. S. R. **Adult & Community Education: An Indian Experiment**, Indian Adult Education Association, New Delhi. 1973
10. Moonis Raza. **Schooling and Rural Transformation**, NIEPA, New Delhi. 1990
11. Seetharamu, A.S. **Education and Rural development**, Prentice Hall, New Delhi. 1980
12. Seetharamu, A.S. & Usha Devi **Education in Rural Areas, Constants and Prospects**, Prentice Hall, New Delhi.1985
13. Sharma, B. D. **Planning for Rural Development**, Prentice Hall, New Delhi.1979
14. Singh K.K. **Environmental Planning for Rural Development.** DVD, Guwahati. 2001
15. Tandhyalaya & Tilak, B. G. **Education and Rational Development**, Prentices Hall, New Delhi. 1986

OP 403:04

EXPERIMENTAL EDUCATION

Unit 1. Basic Concepts

- Meaning of an Experiment in Education, Law of Single Variable (cause & effect relationship.)
- Kinds of Variables: Dependant, Independent, Intervening, Extraneous, Controlling Extraneous Variables
- Mill's Experimental Inquiry: Method of Agreement, Difference, Residue Concomitant Variation & Joint method
- Scope of Experimental Education

Unit 2. Experimental Designs

- Meaning and purpose of Experimental Design
- Essential characteristics of a good Experimental Design
- Basic Principles of Experimental Design (Manipulation, Randomization, Replication and Control.)
- Basic Experimental Errors (S-type, G-type and R-type.)
- Controlling Error Variance: Maximize Experimental Variance, Minimize error variance, Controlling Extraneous Variance ((Max-Min-Con).
- Criteria for selecting an experimental Design (Appropriateness, Adequacy of Control, Internal & External Validity.)

Unit 3. Types of Experimental Designs

Focus, layout, data analysis, advantages and limitations of the following designs

- Pre-Experimental Designs
- One Group Pre-Test Post- Test design
- Two Group Post Test Only Comparison design
- Post test only Equivalent Group Design
- Pretest Post Test Equivalent Group Design
- Quasi – Experimental Design

Unit 4. Lindquist's Basic Experimental Design

- Simple Randomized Design
- Level X Treatment Design
- Subject X Treatment Design
- Group Within Design
- Random Replication Design
- Factorial Design

Unit 5. Statistical Foundation

- Concept of Variance and Analysis of Variance
- Assumptions underlining ANOVA
- One Way Analysis of Variance (ANOVA)
- Two Way analysis of Variance
- One Way Analysis of Co-variance (ANCOVA)

SUGGESTED READINGS:

1. Best, J.W. & James V.K. **Research in Education**, Prentice Hall of India, Pvt, New Delhi.1992
2. Bhatnagar R.P. & Poonam Rajhans **Experimental Designs of Research in Behavioural Sciences**, Bhatnagar Agencies, Meerut. 1989.
3. Broota K.D. **Experimental Design in Behavioural Research**, Wiley Eastern Ltd., New Delhi.1989
4. Collins Mary & Drever James. **Experimental Psychology**, Gayatri Offset Press, New Delhi. 1976.
5. Cronbach, Lee J. **Essentials of Psychological Testing**, Harper and Row, International Education, New York. 1964
6. Ferguson, G. **Statistical Analysis in Psychology and Education**, McGraw Hill, New York. 1966
7. Garett, H.E. **Statistics in Psychology and Education**, Holt Rinehart and Winston, 1969
8. Guilford J.P **Fundamental Statistics in Psychology and Education**, McGraw Hill, New York. 1965.
9. Kerlinger F.N. **Foundation of Behavioural Research**, Indian Edition, Surjeet Publications, Kamla Nagar, Delhi. 2000.
10. Koul, Lokesh **Methodology of Educational Research**, Vikash Publishing House Pvt.Ltd., New Delhi. 1997
11. Linguist, E.F. **Design and Analysis of Experiments in Psychology and Education**, Houghton and Mifflin Company, Boston.1963.
12. Ray,William S. **An Introduction to experimental Design**, The McMillan Comp, New York.1960
13. Rusk Robert R. **An Outline of Experimental Education**, The McMillan Company, New York.1960
14. Sharma R.A. **Fundamentals of Educational Research**, Loyal Book Depot, Meerut. 1984.
15. Winer, B.J. **Statistical Principles in Experimental Design**, McGraw Hill London. 1971

404:01

EDUCATION FOR THE PHYSICALLY AND THE COGNITIVELY CHALLENGED

Unit 1. Exceptionality and Special Education

- Concept of Physically and Cognitively Challenged in the context of Exceptionality
- Treatment of Physically and Cognitively Challenged in historical perspective
- Recommendations of NPE 1986, POA 1992, CABE 1992, RIC Act 1992, PWD Act 1995, for Physically Challenged
- Current Status, Issues and Trends of Special Education for Physically and Cognitively Challenged

Unit 2. Physically Disabled

- Concept of Impairment, Disability and Handicap
- Types and characteristics of Physically Disabled (Visual, Hearing and Orthopedic)
- Assessment of Physically Disabled
- Teaching strategies of Physically Disabled

Unit 3. Mentally Disabled

- Concept of Mental Retardation, distinction between Mental Retardation and Mental Deficiency
- Causative factors of Mental Retardation
- Classification of Mentally Retarded Children and their identification
- Teaching Methods for Mentally Retarded

Unit 4. Learning Disabled

- Concept of Learning Disability, distinction between Learning Disability and Mental disability
- Causes of Learning Disability
- Specific Types of Learning Disability (Reading, Writing and Arithmetic) and their identification
- Education Intervention through development of skills in Reading, Writing and Mathematics

Unit 5. Special Education Programmes for the Physically and the Cognitively Challenged

- Nature, objectives and evaluation of inclusive and exclusive education
- Support services, Guidance, Counselling, School placement, Rehabilitation
- Curriculum Planning: Planning in Curricular Areas, Non-Curricular Activities, Pre-Vocational Skills and Vocational Skills
- Training of teachers and other school personnel for the Education of the Physically and the Cognitively Challenged

SUGGESTED READINGS

1. Alley, G. & Deshler, D. **Teaching the Learning Disabled Adolescent: Strategies and Methods**, L. Publishing Company, Denver. 1979
2. Baine D. **Handicapped Children in Developing Countries: Assessment. Curriculum and Instruction.** University of Alberta, Alberta.1988
3. Baver, A.M.& Shea, M. **Teaching Exceptional Students in Your Classroom**, Allyn and Bacon, Boston. 1989
4. Bender, W.N. **Differentiating Instruction for Students with Learning Disabilities**, Corwin Press, A Page Publication Company, California. 2002
5. Bendor W. N. **Learning Disabilities: Characteristics, Identification and Teaching Strategies**, Allyn & Bacon, Boston. 1995
6. Bhargava, M. **Introduction to Exceptional Children, Their Nature and Educational Provisions**, Sterling Publishers, Pvt. Ltd. New Delhi. 1994
7. Bhatt, V. **The Physically Handicapped**, Popular Prakashan, Bombay.1963
8. Bos, C.S.& Vaugh, A. **Training Strategies for Teaching Students with Learning and Behavioural Problems**, Allyn & Bacon, Boston.1991
9. Chauhan, S.S **Education of Exceptional Children**, Indus Publishing Company, New Delhi .1989
10. Lufting R.L **Teaching the Cognitively Retarded Children: Curriculum, Methods and Strategies**, Oxford University Press, New York.1997
11. Oliver Michael **Understanding Disabilities: From Theory To Practice**, MacMillan, London. 1996
12. Pandey, R.S. & Advani, L. **Perspectives in Disability and Rehabilitation**, Vikas, New Delhi.1995
13. Prasad, J. & Prakash, R. **Education of Handicapped Children, Problems and Solutions**, Kanishka Publishers & Distributors, New Delhi. 1996.
14. Wall, K. **Special Needs and Early Years-A Practioners Guide**, Paul Chapman Publishing, A Sage Publication, New Delhi. 2003
15. Wehman, P. & Melaughlin, P.T. **Programme Development in Special Education**, McGraw Hill Publishers, New Delhi. 1981

OP 404:02

WESTERN EDUCATIONAL THOUGHT

Unit 1. Ancient Greek and Roman Educational Thoughts

- Aims, methods, curricula and organisation of Spartan and Athenian systems of education.
- Views on Education the Greek classical Educational Theorists; Socrates, Plato and Aristotle.
- Contribution of Marcustullius Cicero and Marcus Fabius Quintilianus in Roman Education.

Unit 2. Christian Education Movement contribution of Tertullian, Clement and Origen, Foranciscan and Dominican Education.

Unit 3. Educational trends during the Renaissance and Reformation period, their influence on Western Educational thought and practices.

Unit 4. Influences on Modern Education.

- The age of Industrialization.
- The beginnings of Mass Education with reference to English system: the Monitorial System and the Common School System
- De-schooling Movement in Education
- Views of Ivan Illich, Everest Reneier, Paulo Freire, Paul Goodman.

Unit 5. Psychological Movement in Education.

- View of Johann Heinrich Pestalozzi, Wilhelm Froebel, Hohn Holt, Bruner

SUGGESTED READINGS

1. Bamer, Frauldin Z: **Main Currents of Western Thought**, Readings in Western European Intellectual History from the Middle ages to the present, New York, 1952
2. Bowen James **A History of Western Education**, Methmen & Co., London, 1972.
3. Curtis, S.J. & Boulwood M.E.A. **A Short History of education Idea**, University Tutorial Press, London, 1953
4. Dewey John **Democracy and Education**, McMillan, New York, 1916.
5. Eby, F & Arrow Wood, C.F **The Development of Modern Education**, Prentice Hall Inc., New York, 1934
6. Eby, F & Arrow Wood, C.F **The History and philosophy of Education**, Ancient and Medieval, Prentice Hall Inc., New York, 1940.
7. Froebel, F. **The Education of Man**, Appleton, New York, 1892
8. Froebel, F. **Pedagogues of the Kindergarten**, Appleton, New York, 1900.
9. Granes, F. P. **Great Educators of 3 Centuries**, The MacMillan, Company, New York, 1912
10. Green, J. A **Life and Work of Pestalozzi**, University Tutorial Press Ltd., London, 1913
11. Gwynn A. **A Roman Education from Cicero to Quintilian**, Clarendon, Oxford, 1926
12. Ivan Illich **Deschooling Society**, Penguin, The Pelican book, London. 1970.
13. Meyer, A. E. **An Educational History of the Western World**, McGraw Hill Book Company, New York. 1972.
14. Nettleship **The Theory of Education in Republic of Plato**, The University Press, Chicago, 1906
15. Paulo Friere **Pedagogy of the oppressed**, Penguin Books, Great Britain, 1982(Reprint)

OP 404:03

METHODS OF TEACHING AT THE TERTIARY LEVEL

Unit 1. Learning and Instruction

- Meaning of Learning and Instruction
- Concept of System - Systems Approach to instruction
- Role of the teacher in the Instructional System

Unit 2. Teaching and Teaching Competencies

- Concepts of teaching, teaching effectiveness and teacher competencies
- Classification of teacher competencies

Unit 3. Theories of Learning and Teaching

- Theories of Learning; behaviourism and cognitvism
- Developmental Theory of Learning (Jean Piaget)
- Discovery Approach to Learning (J.S. Bruner.)
- Meaningful Verbal Learning (David Ausubel.)

Unit 4. Teaching Skills and Teaching Strategies

- Teaching Skills: introducing a lesson, questioning, stimulus variation, reinforcement, increasing pupil participation, achieving closure, etc. integration of different skills
- Teaching Strategies: Autocratic style, permissive style

Unit 5. Methods of Teaching at the Tertiary Level

- Teacher Centred-lecture, demonstration, team-teaching
- Learner Centred – Programmed Learning; Personalized System of Instruction, Computer Assisted Instruction
- Other Methods – seminar, workshops tutorials etc., group discussion, projects
- Types of Teaching aids and their value and use in classroom instruction
- Research teaching in India

SUGGESTED READINGS

1. Bloom, B.S. et. al. — **Taxonomy of Educational Objectives, Handbook I. Cognitive Domain**, David McKay Co., Inc., New York. 1956
2. Chand T. — **Principles of Teaching**, H.P. Bhargava Book House, Agra. 2002
3. Chauhan, S.S. — **Innovations in Teaching Learning Process**, Vikas Publishing House, Pvt.Ltd., New Delhi.1989.
4. Dale, E. — **Audio Visual Methods in Teaching**, Holt Rinehart and Winston, New York. 1954
5. Elton, L. — **Teaching Higher Education: Appraisal and Training**, Kegan Page, London. 1987
6. Kochhar, S.K. — **Methods and Techniques of Teaching**, Sterling Publishers, New Delhi. 1981
7. Kulkarni, S.S. — **Introduction to Educational Technology**, Oxford and IBH Publishing Co., Bombay. 1986
8. Mamidi,Malla Reddy & Ravishankar (eds) — **Curriculum development and Educational Technology**, Sterling Publishers, New Delhi. 1984
9. Naik. D. — **Teaching Skills Through Micro Teaching**, H.P. Bhargava Book House, Agra. 1994
10. Narulam — **Effective Teaching In Higher Education**, H.P. Bhargava Book House, Agra. 2000
11. Pervival, F. & Ellington H. — **A Handbook of Educational Technology**, Nicholas Publishing Company, New York. 1984
12. Ruhela, S.P. — **Educational Technology: A Systemic Textbook**, Associated Publishers, Ambala Cantt. Ambala. 1991
13. Sharma, G.D. & Shakti R Ahmed. — **Methodologies of Teaching in Colleges**, NIEPA, New Delhi. 1986
14. Sharma, R.A. — **Technology of Teaching, H.P. Bhargava Book House, Agra. 2002**
15. Vedanayagam, E.G. — **Teaching Technology for Colleges**, Sterling Publishers Pvt.Ltd., New Delhi. 1988

5:2:5 - SYLLABUS

(v) Revised Syllabus for MA/M.Sc Economics 2002.

The Revised Syllabus for MA/M.Sc Economics 2002 was considered and approved in the last 68th meeting of the Academic Council held on 4th and 5th December, 2002. However, the Council decided that a special paper on North-East should figure in the Syllabus.

As desired by the Council, the draft Syllabus on the special paper "Economy of North-East Region" has been received from Dean, School of Economic, Management & Information Sciences vide his letter dt.3.6.03 that the said paper has been approved by the SEMIS School Board in its meeting held on 30th May, 2003.

The draft Syllabus on the special paper is placed as Annexure 'A'.

The matter is placed before the Council for consideration.

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ECO 3011 ECONOMY OF NORTH-EASTERN REGION.

Unit-I Regional Economy (12)

1.1 Basic characteristics of the Economy of North-Eastern Region.

1.2 Dualistic Structure of the North-Eastern Economy.

1.3 Structure of Regional Economy.

1.4 Structural Change : Intersectoral Analysis

Unit-II Natural Resources and Agriculture (11)

2.1 Land ownership and Land Use Pattern and Its Impact on Regional Economic Development.

2.2 Forest and Mineral Resources.

2.3 Major Agricultural Practices, Cropping Patterns and Problems of Agriculture

2.4 Agricultural Productivity and Modernisation.

Unit-III Infrastructure and Industry (11)

3.1 Economic Infrastructure: Power,Road,Transport & Communication.

3.2 Industrial Structure and Causes of Industrial Back wardness.

3.3 Major Industries of NER oil, Minerals, Cement and Tea.

3.4 Small scale and Cottage Industries.

Unit-IV Human Resource Development (11)

4.1 Population,Growth and Occupational Structure

4.2 Employment and Unemployment.

4.3 Migration Major Issues.

4.4 Status of Human Development

Basic Reading List.

1. Agarwal, AK(1987)Economic Problems and Planning in North East India,Sterling Publishers Pvt.Ltd.

2. Alam,K(ed)1993)Agicultural Development in North East India: Constraints and Prospects,Deep and Deep Publications,New Delhi.

3. Datta-Ray,B(Ed)(1980),Shifting Cultivation of North-East India,North East Indian Council for Social Science Research (NEICSSR),Shillong.

4. Dutta, S (ed)2002)Cross-Border Trade of North-Eastern Region, Hope India Publications, Haryana.

5. Goswami,Atul(ed)(1996),Land Reforms and Peasant Movements:A Study of North East India, Omsons Publications, New-Delhi.

6. Gunner Myrdal (1973)(reprint):Economic Theory and Underdeveloped Regions, Vora and Co,Bombay.

7. Meier, G M and Rauch,JF (2000)Leading Issues in Economic Development(7th Edition),Oxford University Press,New York.

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Additional Reading List.

1. Agarwal,AK (1988)."From Jhum to Settled Cultivation"Commerce, 157.

2. Basic Statistics, North Eastern Council,2000

3. Das,Gurudas and RK Purkayastha (eds)(2000)Border Trade: North East India and Neigbouring Countries,Akansha Publications, New Delhi.

4. Dasgupta, M (1983)"Anatomy of a Jhum Failure:Some Extensions" The Journal of North East Indian Council for Social Science Research (NEICSSR),7:1,April,Shillong.

5. Dasgupta, M and A Banerjee,(1984)."Jhumming as the Way of Life of Jhumias:An Analysis of Data from Tripura"The Journal of North East Indian Council for Social Science Research (NEICSSR),8:1,April, Shillong.

6. Ganguli,JB(1983)"Operation of the Jhum Model",The Journal of North East Indian Council for Social Science Research (NEICSSR),8:2,October,Shillong.

7. Gopalakrishnan,R (1995).The North-East India:Land,Economy and People,Har Anand Publications, Delhi.

8. http:/WWW.Neidanabank @hub.nic.in

9. http:/WWW.nerdanabank @nic.in

10. Journal of North Eastern Council.

11. Mathew, T (ed)(1980).Tribal Economy of the North-East Region, Spectrum Publications, Guwahati.

12. North East Data Bank,NEDFI, Guwahati.

13. Science Research (NEICSSR),8:1,April, Shillong.

14. Srivastav, N'2000,Survey of Research in Economics on North-East India 197?-199?, ICSSR-NERC,Regency Publications,Delhi.

(vi) – Syllabus of two Diploma Courses in
1) Visual Arts (Painting) and
2) Performing Arts (Music).

As informed by Prof.Helen Giri vide her leter No.F.11-10/CAU/2003-1414 of 2nd June'03 placed as Annexure 'A' the proposal for conducting a two Semester Certificate-Course in Creative Arts was placed befor the School Board Meeting held on 19th May'03 and the Board resolved that the certificate course should be changed into a two Semester Diploma course and secondly to unitise the Syllabus of the Course uniformly. Accordingly, as advised by the School Board, the Certificate Course has been changed to two Semester Diploma Courses as indicated above.

The detailed course structure of the above two courses is placed as Annexure 'B' & other enclosures as stated are placed at Annexure 'C', 'D' & 'E'.

The matter is placed before the Council for consideration.

****** ****** ******

NORTH EASTERN HILL UNIVERSITY
BIJNI COMPLEX, LAITUMKHRAH,
SHILLONG-793003.

CREATIVE ARTS

No.F.11-10/CAU/2003-1414 Dated :2nd June, 2003.

To,

The Dean,
School of Social Sciences,
NEHU, Shillong.

Sub:- Agenda item from Creative Arts in the coming Academic Council for two Diploma Courses in:
(1) Visual Arts(Painting)
(2) Performing Arts(Music).

Sir,

In inviting a reference to the above, we are sending herewith the detailed Course Structure of the above two Diploma Courses which may kindly be placed before the coming Academic Council from your end in its meeting on 16th & 17th June 2003.

The proposal for conducting a two Semester Certificate Course in Creative Arts was placed before the School Board in its meeting held on 19th May 2003. The above meeting of the School Borrd resolved:

(1) That the Certificate Course should be changed into a two-Semester Diploma Course.

(2) To unitise the Syllabus of the Courses uniformly.

As advised by the School Board, the Certificate Course has been accordingly changed to Two Semester Diploma Courses in -

(1) Visual Arts (Painting) and
(2) Performing Arts (Music).

Contd...2/-

Please find enclosed :

(1) The Course Structure of the two Diploma Courses in :

(1) Visual Arts (Painting)
(2) Performing Arts (Music).

(2) Copy of letter from the Principal Secretary, Education Department, Govt. of Meghalaya, Shillong.

(3) Minutes of the Expert Committee Meeting held on 16th & 17th April 2003.

(4) List of Steering Committee Members.

Thanking you,

Yours faithfully

Sd/-
(Dr.(Mrs) Helen Giri)

Copy to :-

The Deputy Registrar(Conference), NEHU, Shillong with a request that the needfull be kindly done.

****** ****** ******

1. Introduction :

The Centre for Cultural and Creative Studies consists of two units :

(a) Creative Arts Unit and
(b) Unit for Literary and Cultural Studies

2. Proposal :

The Creative Arts Unit proposes to start two Diploma Courses in .

(1) Performing Arts (Music)
(2) Visual Arts (Painting).

Duration of the Course – 1 year

Eligibility – Graduation with an aptitude in Music/Painting.

Pattern - Semester System

Number of Semesters - two.

Number of Papers/Courses - 8 (eight) in each Diploma Course.

Full marks for each Paper will be 100. (Inclusive of Theory and Practicals)

Provision for internal and external assessment: 25% + 75% respectively.

For internal assessment, in courses with no Practical, there will be weightage of 25%. However, in case of courses with both Theory and Practical, division of weightage will be 10% for Theory and 15% for Practical. For external assessment, in courses with Theory or Practical only, weightage of 75% will be given. However in courses with both Theory and Practical this 75% will be divided into 45% (Practical) 30% (Theory).

3. Faculty position in Creative Arts Unit :

Professor	- 1 no	
Reader	- 2 nos	(two to be filled)
Lecturer	- 3 nos	(one to be filled)
Total	6 Nos	

Others:

Programme Organizer (S.T.A)	- 1 No.
Asstt. Programme Organizer	- 1 No.
Stenographer	- 1 No.
L.D.C/Typist	- 1 No.
Peon	- 1 No.

4 In addition to the normal functions/activities, the Unit also conducts regular Extension Programmes, Casual Art Classes in Music and Painting.

Course Structure

Performing Arts (Music).

Semester I

Course No:CA.301	**Brief History of Indian Classical Music and its Development in general.**
Course No:CA.302	**Introducing General Musical Terms.**
Course No:CA.303	**An Introduction to Indian Classical Music (Practical).**
Course No:CA.304	**Concept of the Rhythmic Pattern of Meghalaya.**

Semester II

Course No:CA.401	**A Study of Selected Musical Instruments: Their Classification and Crafting.**
Course No:CA.402	**Songs of Meghalaya.**
Course No:CA.403	**Practical Training in Indian Classical Music.**
Course No:CA.404	**An Introduction to Western Musical (Staff) Notation.**

Detailed Syllabus

Course No:CA.301 **Brief History of Indian Classical Music and its Develop in general.**

Objective: This Paper shall form the background to the study of Indian Classical (Hindustani) Music alongside the Cultural evolution of India from the earliest to the modern times.

Course Content:

A. Growth of Indian Music in the Vedic Period: Evolving Trends (Early Vedic Period) and (Later Vedic Period).

B. Indian Music in the Medieval Period: Development of Court Music, Evolution and Growth of Gharanas (Hindustani – Vocal).

C. Impact of the Indian Renaissance on the Development of Music in India.

Essential Readings:

1. A.L.Basham : *The Wonder that was India*, Rupa and Company, New Delhi (Third Edition) 1966.

2. B.N.Luniya : *Evolution of Indian Culture*, Lakshmi Narain Agarwal. Agra 3 ,1998.

3. B.K. Kakati : *The Mother Goddess Kamakhya*, Lawyer's Book Stall, Guwahati 1948 (First Edition), 1967 (Reprint).

4. K.M. Panikkar : *A Survey of Indian History*. Asia Publishing House, Bombay, 1963.

5. M.S.Chakravorty : *Indian Musicology (Melodic Structure)*, Firma KLM Pvt, Ltd, Calcutta, 1992.

6. Swami Prajnanananda : *A Historical Study of Indian Music*, Munshiram Manoharlal Publishers Pvt Ltd, New Delhi, 1981 (Second Edition).

7. Sumati Mutatkar (Ed.) : *Aspects of Indian Music: A Collection of Essays.*

Sangeet Natak Akademi Publication, New Delhi, 1987.

Course No:CA.302 **Introducing General Musical Terms.**

Objective: This will help students understand the Musical terms in the study of Music.

Course Content:

A. Indian Classical: Vocal (Nada, Shruti, Swara, Saptak, Thata, Jaati, Alankar, Varna, Raga, Meend).

B. Western: General Introduction (Note reading, Rests, Key Signatures, Time Signatures, Tied note, Syncopation, Corona).

C. Regional-North East. India with special reference to Meghalaya.

Essential Readings:

1. Arun Kumar Sen : *Indian Concept of Rhythm,* Kanishka Publishers and Distributors, New Delhi, 1994.

2. C. Khongwir : *Ki Sainuka Ka Duitara,* Shillong, 1975.

3. H. Lyngdoh : *Ka Mam Khasi,* Shillong, 1970.

4. James Murray Brown : *Handbook of Musical Knowledge,* Trinity College of Music, London, Reprint, 1989,(can be had from L.M.:Fatado and Company, Kalba Devi, Mumbai – 400002).

5. Sushil Kumar Saxena : *The Winged Form: Aesthetical Essays on Hindustani Rhythm,* Sangeet Natak Akademi, Publication New Delhi, 1979.

6. Sandeep Bagchee : *Nad: Understanding Raga Music,* Eeshwar Publications, Mumbai, 1998.

7. V.S.Nigam : *Musicology of India,* Part I, Part II (1992), Part III (1993) and Part IV (1993): 73, Rajendra Nagar, (1994) Lucknow–226004.

Course No:CA.303 An Introduction to Indian Classical Music (Practical).

Objective : This Paper intends to gradually introduce Indian Classsical (Hindustani) Music to the students. Through this Course, students can be nurtured/exposed to Indian Classical Music.

Course Content:

A. Voice Culture – Practice of Paltas . .

B. Sargams/ Swara Mallikas of Rag Bilawal and Rag Bhoopali (inclusive of Aroho, Avoroho, Pakad).

C. Notation Reading and Writing and Oral Rendition of some Talas.

Essential Readings :

1. Ashok Da Ranade : *Hindustani Music*, NBT, India, 1997.

2. M.S. Chakravorty : *Indian Musicology (Melodic Structure)*, Firma Klm Pvt Ltd Calcutta, 1992.

3. Sergius Kagen : *On Studying Singing*, Dover Publications, New York, 1960.

4. Sandeep Bagchee : *Nad: Understanding Raga Music*, Eeshwar Publications, Mumbai, 1998.

5. V.S. Nigam : *Musicology of India*, Part I, Part II (1992), Part III (1993),and Part IV (1993), 73, Rajendra Nagar, Lucknow- 226004.

Course No:CA.304 **Concept of the Rhythmic Pattern of Meghalaya.**

Objective: This Paper intends to introduce to the students the concept of rhythmic pattern of Meghalaya and also give them practical training through Membrane Instruments.

Course Content:

A. A Study of the different rhythmic patterns of Khasi Jaintia Hills.

B. A Study of the different rhythmic patterns of Garo Hills.

C. Practice of selected beats.

Essential Readings :

1. A. Playfair : *The Garos*, London, 1909.

2. Birendranath Dutta (Ed) : *Traditional Performing Arts of North East India*, Assam Academy for Cultural Relations, Gauhati, 1990

3. Helen Giri (Ed) : (i) *Lest We Forget*, Sevenhuts Enterprise, Shillong 1994.
(ii) *Ba Ioh Ngi Klet*, Sevenhuts Enterprise, Shillong, 1994.

4. L.P.Vidyarthi : *Art and Culture of North East India*, Publications Division, Govt of India, 1993. (Revised Edition).

5. M.P.R. Lyngdoh: *Festivals in the History and Culture of the Khasis*, Vikas Publishing House, New Delhi, 1991.

6. P.R.T. Gurdon : *The Khasis*, Cosmo Pubilcations, Delhi 1975.

7. Seng Khasi : *Khasi Heritage*, Ri Khasi Press, Shillong, 1969

Course No:CA.401 **A study of Selected Musical Instruments : Their Classification and Crafting.**

Objective: This Paper will familiari . students with an understanding of some Musical Instruments and their influence on the evolution/classifica.ion of Music. The students will understand the different stages how the musical instruments are being crafted. They will also understand the scope of vocational skills.

Course Content:

A. Membranophones : Chordophones: Aerophones : Others.

B. A Study of the Crafting of some Musical instruments: Materials used and Execution (Field Trip to some selected areas of Meghalaya).

C. A Study of the contribution of some Master Craftsmen of the State.

Essential Readings :

1. B.C. Deva : *Musical Instruments.* NBT, India, 1979.

2. Dilip Bhattacharya : *Musical Instruments of Tribal India.* Manas Publications, New Delhi, 1999.

3. H.K. Ranganath (Ed) : *Sangeet Natak Silver Jubilee Volume,* Sangeet Natak Akademi, New Delhi, 1981.

4. Ranjit Deb: *Tabla and Taal,* Surajit Publishing, Shillong, 1996.

5. Suneera Kasliwal: *Classical Musical Instruments.* Rupa and Company, New Delhi, 2001.

6. A.B.K.Choudhury : *Tribal Songs of North East India,* Firma KLM Pvt. Ltd, Calcutta 1984.

Documentation : Visuals (CD's Slides) available in the Creative Arts Unit, NEHU

Course NO:CA. 402 **Songs of Meghalaya.**

Objective : This course will acquaint the students with the different composed songs of Meghalaya since the establishment of the All India Radio, Shillong in 1948 The songs of different composers will be chosen on the basis of thematic relevance keeping in view the core and content of the songs. Different batches of students will therefore have access to different compositions.

Course Content:

A. Songs of Nature (4 numbers).

B. Lullabies (4 numbers).

C. Patriotic Songs (4 numbers).

(These twelve songs selected batch-wise will be approved by the Steering Committee from time to time).

Essential Readings:

1. Birendranath Dutta (Ed) : *Traditional Performing Arts of North East India*, Assam Academy for Cultural Relations, Gauhati, 1990.

2. C. Khongwir : *Ki Satmuka Ka Duitara*, Shillong, 1975.

3. L.G.Shullai *Ka Phiang Rupa*, Ri Khasi Press, Shillong, 1979.

4. Milton Sangma : *History and Culture of the Garos*, New Delhi, 1981.

5. P.W. Shullai : *Ngin Rwai Lang Bad Phi*, Shillong 1998.

6. Victor G.Bareh: *Ki Jingrwai Khasi – Staff Cum Solfa Notation*, Publication Board, Assam, Guwahati, 1960.

7. Webster Davies Jyrwa : *Ha ki Ksai ka Duitara*, Shillong 1994

Additional :

1. Collection of Audios from All India Radio, Shillong (Available in the Creative Arts Unit, NEHU).
2. Seng Khasi : *Ki Jingrwai Seng Khasi*, Ki Khasi Press, Shillong, 1980.
3. *U Myllung Ha Ki Sur*, Thup I, Creative Arts Publication, NEHU Shillong, 2001.

Course No:CA.403 **Practical training in Indian Classical Music.**

Objective: Since the students have already been introduced to Indian Classical (Hindustani) Music in the First Semester, learning the Raga system of Indian Music practically is indispensable in the Second Semester. These are therefore some Ragas which a student can learn at this level.

Course Content:

A. Sargams/Swara Mallikas of Rag Yaman and Rag Bhairab (inclusive of Aroho, Avoroho, Pakad).

B. Chota Khayals with a few Taans (Rag Yaman and Rag Bilawal).

C. Chota Khayals with a few Taans (Rag Bhoopali and Rag Bhairab).

Essential Readings:

1. Arun Kumar Sen: *Indian Concept of Rhythm*, Kanishka Publishers and Distributors, New Delhi, 1994.
2. Ashok Da Ranade : *Hindustani Music*, NBT,India, 1997.
3. M.S.Chakravorty : *Indian Musicology (Melodic Structure)*, Firma KLM Pvt Ltd Calcutta, 1992.
4. Sandeep Bagchee: *Nad: Understanding Raga Music*, Eeshwar Publications, Mumbai, 1998.
5. V.S. Nigam: *Musicology of India*, Part I, Part II, (1992), Part III (1993), Part IV (1993), 73, Rajendra Nagar, Lucknow – 226004.

Course NO:CA.404 **An Introduction to Western Musical (Staff) Notation (Practical).**

Objective: To familiarize the students with Western Musical (Staff) Notation.

Course Content:

A. Voice Culture.

B. Scales (a) Diatonic and Chromatic.
(b) Major and Minor.

C. Chords and Accidentals, Harmonization and Cadences.

Essential Readings :

1. James Murray Brown: *Handbook of Musical Knowledge*, Trinity College of Music, London, Reprint, 1989, (can be had from L.M. Fatado and Company, Kalba Devi, Mumbai – 400002.

2. Jeremy Yudkin : *Understanding Music*, School for the Arts, Boston University – Prentice Hall, Inc, Simon & Schuster/ A Viacom Company, Upper Saddle River, New Jersey, 1996.

3. John Curwen : *Musical Theory, Book I, The Common Scale and Time*, London, 1879.

4. K.B. Sandved (Compiled & Edited) : *The World of Music*, Volume I & II, The Waverly Book Company, Ltd,London, 1957.

5. Serguis Kagen : *On Studying Singing*, Dover Publications, New York, 1950.

Course Structure :

Visual Arts (Painting)

Semester – I

Course No:CA.101	**Fundamentals of Visual Arts**
Course No:CA.102	**Introduction to Traditional Folk art and crafts of North East India with special reference to Meghalaya**
Course No:CA.103	**Drawing and colour Application (Practical)**
Course No:CA.104	**Modelling (Practical)**

Semester – II

Course No:CA 201	**Introduction to Indian and Chinese Art**
Course No:CA.202	**Introduction to Western Art**
Course No:CA.203	**Creative Painting (Practical)**
Course No:CA.204	**Print making (Practical)**

Detailed Syllabus

Course No:CA.101 **Fundamentals of Visual Arts**

Objective : The Course emphasises on creating an awareness in the stude of the principles of visual arts and the basics of design and art appreciation.

Course Content:

A. Definition, Meaning and Importance of Fine Arts (Visual Arts)

B. Creative process -- Perception, observation, Imagination and Creative expression

C. Elements of Art – Line, form, colour, tone, texture, and space scale, mass, volume and dimension

D. Principles of composition –Unity, Harmony, Balance,

Emphasis, Rhythm

Essential Readings:

1. A.K.Coomaraswamy : *Transformation of nature in art*: Munshiram Manoharlal publisher Pvt Ltd, 1994

2. Carritt E. F: *Theory of beauty*: Barnes and Noble, New York, 19[illegible]

3. Faulkner, [illegible] *Art Today*: Holt, Rinehart and Windstone, New York, 1956

4. Herbert read : *The meaning of art*: Faver and Faver, Queen Square, London, 1974

5. Joshep A Galto : *Exploring visual design* : Davis publication, 1987

6. Knobler, Nathan:*The Visual dialogue; and introduction to the appreciation of art* : Rinehant and Windstone, New York, 1971

7. R.G. Collingwood: *The principles of Art* : Oxford University Press, New York, 1974

Course No:CA.102 **Introduction to Traditional Folk Arts and Crafts of North East India with special reference to Meghalaya**

Objective : The Course intends to familiarize the students with the Folk Art and Crafts Traditions of North East India, in general, with special reference to Meghalaya, to enable them to appreciate simplicity in Folk Art forms, techniques and spontaneity in expression through Colour, line, form and design.

Course Content:

A. Introduction to Traditional Folk Paintings of North East India

B. Introduction to Traditional Folk Wood-carvings of North East India

C. Introduction to Traditional Folk Terracotta Art of North East India

D. Introduction to History of Traditional Folk Art and crafts of Meghalaya

Essential Readings: 1. Birendranath Dutta : *Folk painting in Assam*. Tezpur University Publication, 1998

2. H.B.Ngapkynta : *Art History of Meghalaya* : Agam Kala Prakashani, Delhi, 1991

3. J.N.Choudhury: *The Knasi canvas*. Quinton Road, Shillong,1978

4. L.P. Bidyarthi: *Art and Culture of North East*: Publication Division, Ministry of Information and Broadcasting, Govt of India, 1993

5. Nilima Roy: *Art of Manipur*: Agam Kala Prakashani, Delhi, 1979

6. Verrier Elwin : *The Art of North – East Frontier of India*: North East Frontier Agency Shillong,1959

Course No:CA.103 **Drawing and colour application (practical)**

Objective : Practicals are intended to train the students to accurate observation and skills of graphic presentation, free hand drawing and exercise with colour from objects and nature to study proportion, volume and visual perspective, suggestion of solidity by line as well as light and shade, realization of rythmic relationship between line, mass, volume and texture, and emphasise on variety of visual experiences and theory of colour to develop the ability to draw and pain.

Course Content:

A. Nature study, Annual study in line and tone with Pencil, Charcoal, water colour

B. Life model study in line and light and shade with pencil, Charcoal pestel colour

C. Landscape study in water colour and pen & ink

D. Study of Perspective and foreshortening study from different objects in pencil, pen and ink.

Additional Reading :

1. Aurthur Thomson :*Handbook of Anatomy for Art Student* : Dover publication New York ,1969

2. Geraldine Christy : *Step by step Art School: Pastels* :Hamlyn, London, 1992

3. Jenny Rodwell: *Step by step Art School: Drawing* Hamlyn

London, 1987

4. Jack Buchan and Jonathan Baker: *Step by step Art School : Still Life*: Hamlyn, London, 1994

5. Jack Buchan and Jonathan Baker: *Step by step Art School : Landscape:* Hamlyn, London, 1993

6. Patricia Monahan : *Step by step Art School : Water Colour:* Hamlyn, London, 1990

Course No:CA.104 **Modelling (practical)**

Objective : The course is aimed at training in modeling to develop visual awareness in three dimensions, through manipulative skills in clay plaster and cement, and understanding of the aesthetics of three dimensional forms, texture and body colour of the materials, and principal of weight, mass, volume space and contour.

Course Content:

A. Detailed study of eye, nose, ear, feet, lip with clay

B. Portrait and fugure study in clay

C. Three dimensional composition in Relief and round

D. Exercise in mould and casting (cement and plaster)

Additional Readings :

1. Aurthur Thomson: *Handbook of Anatomy of Art Student :* Dover publication , New York , 1969

2. Charlotte F.E: *Hand in Clay:* Mayfield publishing company, London, 1989

3. Irwin Kremen : *Collage and Sculpture :* Greensboro, Green hill Centre for North Carolina, 1996

4. Luns, Theo : *The beginner's book of clay modeling :* Newton, Mass. C.T. Brandford, 1959

5. Stuart B. Flexner (Editor):*Understanding Art: Themes, Techniques and Methods:* Random House, New York 1981

6. Aurthor : Mayer, Ralph: *Artistes Handbook of Materials and Techniques :* Viking Books, 1999

Course No:CA.201 **Introduction to Indian Chinese Art**

Objective : Objective of the course is to familiarize the students with the evolution of the art Traditions in India and China since early time to enable them to identify the stages in development, changes in materials and techniques, form and concept, art culture linkages, and the elements of change and continuity in visual art.

Course Content:

A. Art of early civilization of India (Mohenjodaro, Sanchi, Mathura, Saranath and Gandhara)

B. Art of early civilization of China (painting only)

C. Indian of miniature paintings

D. Modern Art in India

Essential Readings:

1. A.K. Coomaraswamy : *History of Indian and Indonesian Art:* Munshiram Manoharlal, Delhi, 1972

2. Earnest C. and J.W. Watson: *Indian Miniature Painting:* Wisconsin Press, Madison. 1971

3. Heinrich Zimmer : *The Art of India Asia (2 Vol)* : Princeton University Press. New Jersey, 1968

4. Mario Bussagli :*Indian Miniatures* : Macmillan Company of India Ltd., New Delhi, 1976.

5. Michael Sullivan : *A short history of Chinese Art :* Faver and Faver, Russell Square, London, 1967

6. Pramath Mago :*Contemporary Art in India: A perspective :* National Book Trust, India, Delhi, 2001

7. W.G. Archer : *India and Modern Art :* Ruskin House, George Allen and Unwin Ltd. London, 1959

Additional Readings :

1. Edith Tomory : *History of fine Art in India and West :* Orient Longmans, Bombay, 1968
2. Mario Bussagli : *Art of India :* Harry N. Abrams, New York,1987
3. Mulk Rag Anand : *Album of Indian paintings :* NBT. India, New Delhi. 1973

Course No:CA.202 **Introduction to Western Art**

Objective : The course intends to acquaint the students with the major themes in the history of Western art since early times and the major art movements, including the changes in method – materials, techniques, concept philosophy and interpretation and the prepare the students to appreciate the western influences on the modern art field.

Course Content:

A. Early Western Art (Greek Art to Renaissance Art)

B. Baroque Art and Romantic Art (Delacroix and Goya)

C. British landscape painting (Constable and Turner) and impressionist paintings

D. Abstract Art Movement

Essential Readings:

1. Edith Tomory : *History of Fine Arts in India and West* : Orient Longmans, Bombay, 1968

2. Erwin O. Christensen : *The History of Western Art* : New American Library, USA, 1959

2. Gombrich E.H : *The Story of Art.*: Phaidon, New York 1950

4. H.H. Arnason :*History of Modern Art (Vol I & II)* : Thames and Hudson, London, 1983

5. H.W. Janson : *History of Art* : Thames and Hudson Ltd London 1977

6. Jean Anne Vincent :*History of Art* : Barnes and Noble, New York, 1968

7. Pierre D. Espezel and Francoisfosca :*A concise Illustrated History of European Painting*: Washington Square Press, Inc. New York 1961

Course No:CA.207 **Creative Paintings (practical)**

Objective: This practical course emphasizes on colour, composition and Individual techniques, exercise indifferent types of composition (thematic, subjective and abstract) and exploration of various phases of contemporary painting and aesthetic principals in order to develop distinctly a personal style.

Course Content:

A. Life study and still life study in oil and acrylic

B. Analysis of Composition: exercise in the use of form, line colour, texture.

C. exercise in different media

D. Creative composition based on studies.

Additional Readings :

1. Jack Buchan and Jonathan Baker : *Step by step Art School : Gouache :* Hamlyn, London, 1993

2. Jane Wildgoose : *Step by step Art School: Painting on Silk :* Hamlyn, London, 1994

3. Pope Arthur : *The Language of drawing and painting* :Cambridge: Harvard, 1949

4. Patricia Seligman : *Step by step Art School : oils* : Hamlyn, London , 1991

5. Stuart B. flexner(Editor) : *Understading Art: Themes, Techniques and Methods:* Random House, New York, 1991

6. Wendy Clouse : *Step by step Art School: Acrylics* : Hamlyn, London, 1991.

Course No:CA.294 **Print Making (practical)**

Objective : This course intends learning basic techniques in surface print making in one and more colours, simple methods of making blocks with plywood, wooden block, linoleum and silk screen printing and experimental printing, using different type of texture, colours and forms on different surface.

Course Content:

A. Lino – cut print making – Monochrome and multi colour

B. Wood-cut print making – Monochrome and multi colour

C. Monochrome silk screen print making on paper

D. Silk screen print making on different surface

Additional Readings:

1. Aurthor : Mayer, Ralph : *Artist handbook of materials and techniques* : Viking Books, 1991

2. Bhalchandra Khadke : *Introduction to screen printing* : MAC Enterprise, Bombay, 1974

3. Ballinger, Raymond A : Art and reproduction : graphic reproduction techniques : Van Nostrand, Reinhold, New York, 1977

4. Curwen,Harold : Process of graphic reproduction in printing, Faver and faver, London 1966

5. Kailas Taklu : *Guide to screen printing* ; Vishwas Seriprinters, Thane, 1972

5:2:6(22) Annexure - 'C'

TRUE COPY

GOVERNMENT OF MEGHALAYA
EDUCATION DEPARTMENT

NO. EDN. 380/2001/3
Dated Shillong the 2nd May 2002.

From : Ranjan Chatterjee,
Principal Secretary,
Education Department,
Government of Meghalaya.

To: The Vice-Chancellor,
North Eastern Hill University,
Meghalaya, Shillong.

Sub.- Opening of Diploma/Certificate Course for Teachers in Creative Arts in NEHU.

Sir,

As most of us are aware, the scenario of Creative Arts in Meghalaya, especially with regard to the traditional art forms, is not academically or professionally streamlined. Besides lacking exposure to creative expressions, Creative Arts aspirants of Meghalaya lack a formal and systematic approach even to native art forms of the State. Even teachers teaching Creative Arts in the schools do so with the minimal self-acquired knowledge that they have learnt here and there without any systematic and theoretical background. One of the ways to improve the quality of the Creative Arts in Meghalaya is to provide an intensive but comprehensive course to teachers of our schools having the right aptitude and attitude in Creative Arts so that they can help their students build a correct, useful and professional approach to the learning of Creative Arts.

The Document on National Curriculum Framework for School Education has given due importance to Art Education at all levels of School Education thereby emphasizing the fact that Art Education plays an important role in the wholesome development of the individual through the kindling of the finer aesthetic senses of a child. The Document also aptly emphasizes the role of Art Education as an agent of National Integration that creates awareness and appreciation of our National Heritage while at the same time refining and enriching local specific art forms.

...2/-

The North Eastern Hill University through its development of Creative Arts can play a role towards the institutionalization of Creative Arts in Meghalaya by the opening of a Diploma/Certificate Course for School Teachers of Meghalaya in NEHU.

I would request you to give your kind attention to the matter so that the possibilities of such venture can be explored. The Government of Meghalaya, Education Department is willing to extend any assistance that is possible within its capacity.

Yours faithfully,

Sd/- Ranjan Chatterjee.

.....

5:2:6(24) Annexure – 'D'

MINUTES OF THE EXPERT COMMITTEE MEETING FOR THE COURSE STRUCTURE FOR A ONE-YEAR CERTIFICATE COURSE IN VISUAL ARTS AND PERFORMING ARTS IN THE CREATIVE ARTS UNIT, NEHU, SHILLONG HELD ON THE 16TH & 17TH APRIL 2003 AT 11:00 A.M.

(1) Members present : 5(five) Outstation Experts and 3(three) Faculty members of the Creative Arts Unit - totalling 8(eight) members/Experts in all. (Attendance sheet enclosed).

(2) Dr.(Mrs) Helen Giri - Head, Creative Arts Unit, and Chairperson; after welcoming all the Experts, briefly highlighted the experts about the staff position, programmes, activities and the thrust area of the Centre. She also insisted on the urgent need of starting a Certificate Course at the earliest time possible.

(3) Copies of the Course Structure in Visual Arts and Performing Arts were circulated to all Experts. After a detailed examination and discussion of the same, suggestions were made with appropriate modifications by the Experts to cater to the needs of the students and of the region as a whole.

(4) The various suggestions made with all the necessary modifications and corrections will be retyped and copies will be sent to all the Experts of the Committee.

The meeting ended with a vote of thanks to all the Experts by the Chairperson at 4:30 p.m.

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5:2:6(25)

NEHU NOTES

MINUTES OF THE MEETING OF THE EXPERT COMMITTEE FOR THE COURSE STRUCTURE (CERTIFICATE) CREATIVE ARTS, NEHU, SHILLONG HELD ON THE 16TH & 17TH APRIL 2003 AT 11:00 A.M.

MEMBERS PRESENT

(Full Name)	Signature
1. Gora Sarbadhikary	Sd/- (Gora Sarbadhikary) 16.4.03
2. Prof. Nandadulal Mukherjee	Sd/- (Nandadulal Mukherjee) 16.4.03
3. Sikha Dutta (Mrs)	Sd/- (S. Dutta) 16.4.03
4. Bitkupar Laitflang	Sd/- (Bitkupar Laitflang) 16.4.03
5. M.H. Barbhuiya	Sd/- (M.H. Barbhuiya) 16.4.03
6. Rev. Presley B. Lyngdoh	Sd/- (Presley B. Lyngdoh) 16.4.03
7. Lapynshai Syiem	Sd/- (Lapynshai Syiem) 16.4.03
8. Helen Giri	Sd/- (Helen Giri) 16.4.03.

5:2:6(26) Annexure - 'E'

NORTH EASTERN HILL UNIVERSITY
Mawkynroh : Umshing
Shillong.

No.SHC:11-3/Conf/98-655 Dated : 12th June, 2002.

N O T I F I C A T I O N

The Vice-Chancellor, North-Eastern Hill University is pleased to reconstitute the Steering Committee as under for the Centre for Cultural & Creative Studies in terms of the provisions of Clause 11(1) of the University Ordinance OA-11 with immediate effect for a period of three years.

STEERING COMMITTEE:

1.	Head, Centre for Cultural & Creative Studies, NEHU, Shillong.	-	Chairman
2.	All members of the Centre in the rank of professor/Director	-	Member
3.	Dr. Desmond L. Kharmawphlang, Reader, Unit for Literary & Cultural Studies, NEHU, Shillong.	-	-do-
4.	Mr. M.H. Barbhuiya, Lecturer, Unit for Creative Arts, NEHU, Shillong.	-	-do-
5.	Dr. Ester Syiem, Department of English, NEHU, Shillong.	-	-do-
6.	Dr. Pascal Malngiang, Department of Political Science, NEHU, Shillong.	-	-do-
7.	Prof. J.B. Bhattacharjee, Department of History, NEHU, Shillong.	-	-do-
8.	Prof. B.L. Swer, Department of Khasi, NEHU, Shillong.	-	-do-
9.	Prof. Imdad Hussain, Dean, School of Social Sciences, NEHU, Shillong.	-	-do-
10.	Mrs. Shikha Dutta, Lecturer in Music, State College of Music, Rabindra Bhavan, Guwahati-781 001	-	-do-

...2/-

11. Prof. Birendranath Dutta, - Member
Chandrabala Barooah Road,
Silpukhuri,
Guwahati - 781 003.

12. Mr. Webster Davies Jyrwa, - -do-
(Rtd. Director, All India Radio)
Jaiaw Langsning,
Shillong-793002.

Sd/-(P.K.D. Purkayastha)
Assistant Registrar(Conf)

655

To,

Head, Centre for Cultural &
Creative Studies, NEHU, Shillong.

Copy to:

1. Finance Officer, NEHU, Shillong.
2. Head, Centre for Literary and Creative Studies, NEHU, Shillong.
3. P.S. to the Vice-Chancellor, NEHU, Shillong.

Sd/-(P.K.D. Purkayastha)
Assistant Registrar (Conf).

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5:2:6(20)

NORTH-EASTERN HILL UNIVERSITY
Mawkynroh Umshing
Shillong-22

No.SHC:11-3/Conf/98-2 April 3, 2003.

N O T I F I C A T I O N

In partial modification of this office Notification of even No. 655 dt. 12.6.2002, the Vice-Chancellor, North-Eastern Hill University is pleased to nominate Prof. B. War, Department of Khasi, NEHU, Shillong as a member of the Steering Committee for the Centre of Cultural & Creative Studies, NEHU, Shillong with immediate effect for a period upto 11.6.2005 vice Prof. B.L. Swer, since retired.

Sd/-(J.N. Nayak)
Deputy Registrar(Conf).

To

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Copy to:

1. All members of the Steering Committee.
2. Finance Officer, NEHU, Shillong.
3. Head, Centre for Literary & Creative Studies, NEHU, Shillong.
4. P.S. to the Vice-Chancellor, NEHU, Shillong.

Sd/-(J.N. Nayak)
Deputy Registrar(Conf).

Mr. M.H. Barbhuiya,
Unit for Creative Arts, NEHU, Shillong.

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(iv) Appointment of Rajiv Gandhi Chair

The appointment of Rajive Gandhi Chair in the University was discussed in the 115th meeting of the Executive Council held on 5th May,2003 as an item from the Chair and the Council resolved to refer the matter to the Academic Council for deliberation.

The matter is placed before the Council for consideration.

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