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UNIVERSITY OF MYSORE

Estd. 1916

Vishwavidyanilaya Karyasoudha
Crawford Hall, Mysuru- 570 005

No.AC6/453/2016-17 Dated: 22.07.2017

NOTIFICATION

Sub: Revision of the Syllabus for the courses which are being run in the Regional Institute of Education (RIE) from the academic year 2017-18.

Ref: 1. Decision of the Faculty of Education Meeting held on 17.03. 2017.
2. Decision of the Academic Council Meeting held on 30.03.2017.

*****

The Board of Studies in Regional Institute of Education (RIE) which met on 06.08.2016 has decided to Revision the Syllabus of the following program from the academic year 2017-18 and also the title of course "Science and Growing Up" is changed to "Understanding the Learner."

1. B.Sc.B.Ed
2. B.A.B.Ed
3. M.Sc.B.Ed (Mathematics)
4. M.Sc.B.Ed (Physics)
5. M.Sc.B.Ed (Chemistry)

The Faculty of Education and the Academic Council at their Meetings held on 17th March 2017 and 30th March 2017 respectively have also approved the above said proposal and is notified.

The contents is uploaded in the concerned may be downloaded from the University Website i.e., www.uni-mysore.ac.in.

Draft approved by the Registrar

Sd/-
DEPUTY REGISTRAR(Academic)

To:

1) The Registrar (Evaluation), University of Mysore Mysore.
2) The Dean, Faculty of Education, Department of Studies in Education. Manasagangotri, Mysore.
3) The Chairman, Department of Studies in Education, Manasagangotri, Mysore.
4) The Chairman, Board of Studies in Education (PG), Manasagangotri, Mysore.
5) The Principal, Regional Institute of Education, Manasagangotri, Mysore.
6) The Director, College Development Council, MoulyaBhavan, Manasagangotri, Mysore.
7) The Deputy Registrar/Assistant Registrar/Superintendent, AB & EB, University of Mysore, Mysore.
8) The PA to Vice-Chancellor/Registrar/Registrar (Evaluation), University of Mysore, Mysore.
9) Office Copy.

UNIVERSITY OF MYSORE

REGIONAL INSTITUTE OF EDUCATION
[National Council of Educational Research and Training, New Delhi]

REGULATIONS GOVERNING THE PROGRAMME

1.0 Programme and Duration :

Integrated Programme of Teacher Education titled **'Bachelor of Arts and Education' (B.A.B.Ed.)** degree programme. The programme will be of four year duration organized on the semester pattern with 2 semesters in a year. Each semester will consist of a minimum of 16 weeks of instruction excluding examination.

1.1 Equivalence:

The course contents related to English Literature, History, Geography and Political Science offered in the Programme are equivalent to similar courses offered in the B.A. Programme recommended by the UGC (2015) and University of Mysore. The Course contents of the professional education component are equivalent to that of B.Ed.of University of Mysore and are in accordance with the norms and regulations for the B.A.B.Ed. Programme prescribed by the NCTE (2014). This degree B.A.B.Ed. is thereby equivalent to B.A. and B.Ed. degrees of the University of Mysore and the UGC.

On successful completion of the programme, students are eligible for admission to Master Degree Programmes in respective subjects in the University of Mysore and other Indian/Foreign Universities.

2.0 Eligibility and admission

Candidates seeking admission to the programme should have passed CBSE Senior Secondary examination/ Pre-University examination of Karnataka or an equivalent examination of Kerala, Andhra Pradesh, Tamil Nadu, Telangana or the UT of Lakshadweep/Puducherry with 45% marks in the aggregate. Relaxation up to 5% of marks is given to the SC/ST candidates.

Candidates should have passed the qualifying examination with Science, Arts or Commerce subjects.

Admission shall be made by selection on the basis of marks in the qualifying examination and performance in a specially designed national level test (Common Entrance Examination) as per the admission policies of NCERTand the guidelines of the University of Mysore.

Admission will be in accordance with administrative policies related to proportionate representation (based on the latest available census report) to different States in the region. It will also be governed by the reservation policies of Govt. of India as prevalent at the time of admission.

3.0 Scheme of Instruction :

Details of courses and scheme of study, duration, etc. are provided in Table 1.

Courses of Study are organized under the following captions:

a) Core Courses
b) Ability Enhancement Courses
c) Discipline Specific Electives

d) Skill Enhancement Courses
e) Generic Courses
f) Professional Education Courses.

3.1 Core Courses:

The Core courses compromises of the Majors. The Programme offers the following combinations of majors:

a) English Literature, History and Geography;
b) English Literature, History and Political Science

The titles of courses in each major and their positions are given in Table 10.

3.2. Ability Enhancement Courses :

These are mandatory for all students.

Comprises of 4 courses offered during I and II semesters. Two courses in a language of student's choice and two in English.

a) Language : Any one of the following: Hindi/Kannada/Malayalam/Tamil /Telugu
b) English

3.3 **Discipline Specific Electives:** Total of six advanced courses, two in each Major Subject are offered in the VII and VIII semesters of the Programme.

3.4 Skill Enhancement Courses:

Two courses are offered in the III and IV semesters of the Programme. Students can choose any two courses of their choice, cutting across disciplines, from a pool of courses that are being offered in each subject area.

3.5. Generic Courses:

Two courses of inter-disciplinary nature are offered in the I and VIII semesters of the programme.

3.6 Professional Education Courses:

In accordance with the NCTE regulations – 2014, the programme includes 23 courses which are positioned throughout the 8 semesters. The requirements of the 16 week internship proposed by the NCTE, are met through three rigorous phases of School Attachment Programmes. The first two Phases are of 2 week duration each which will be organized in the Demonstration School and selected schools in Mysore. The third phase of 10 week duration is primarily an internship in teaching Programme which will be organized in selected schools of NVS of Hyderabad Region or other schools.

4.0 Attendance

Each student has to attend a minimum of 75% of the classes conducted in each course. Failure to meet the minimum requirement renders disqualification from terminal examination and makes him/her ineligible for NCERT scholarship/ free ship. Such a student is deemed to have dropped the course and is not allowed to write the semester end examination of that course. He has to re-register for the course/s as and when they are offered by the institute.

5.0 Medium of Instruction:

The medium of instruction and examination is English.

6.0 Course Structure

TABLE 1: CREDIT BREAK-UP INTO B.A. AND B.ED. COMPONENTS AND MODE OF EVALUATION

Semesters	Total Credits	Programme	Credits (Theory) (L)	Teaching hours per week (L)	Credits: Practicum/al (Lab/Field) (T/P)	Practicum/al Hours per week (T/P)	Total Hours per week (L+T+P)	Assessment C1+C2	Terminal Assessment C3)
I	24	B.A.	13	13	5	10	23	50	50
		B.Ed.	4	4	2	4	8	50	50
II	24	B.A.	13	13	5	10	23	50	50
		B.Ed.	4	4	2	4	8	50	50
III	23	B.A.	11	11	4	8	19	50	50
		B.Ed.	4	4	4	8	12	50	50
IV	23	B.A.	11	11	4	8	19	50	50
		B.Ed.	4	4	4	8	12	50	50
V	24	B.A.	9	9	3	6	15	50	50
		B.Ed.	7	7	5	10	17	50	50
VI	24	B.A.	9	9	3	6	15	50	50
		B.Ed.	6	6	6	12	18	50	50
VII	17 12*	B.A.	3	3	6	12	15	50	50
		B.Ed.	4	4	16**	8	8	50	50
VIII	21	B.A.	5	5	6	12	17	50	50
		B.Ed.	6	6	4	8	14	50	50
Total	**192**		**113**	**113**	**79**	**134**	**247**		

*internship ** includes internship credits

Tables 2 to 9: Detailed Course Structure of B.A.B.Ed. Programme

Total Credits = 192; B.A. Component = 112; B.Ed. Component =80

TABLE 2: Semester I (Credits: B.A.; 12; AEC 6; B.Ed. 6; Total 24)

Course No.	Total Credits	Courses	Credits: Theory (L)	Teaching Hours per week (L)	Credits: Practicum/al (Lab/Field) (T/P)	Practicum/al Hours per week (T/P)	Total Hours per week (L+T+P)	Periodic Assessment C1+C2	Terminal Assessment C3
1	4	Core Course1A Eng. Literature	3	3	1	2	5	50%	50%
2	4	Core Course 2A History	3	3	1	2	5	50%	50%
3	4	Core Course 3A Geography/ Political Science	3	3	1	2	5	50%	50%
4	3	AEC 1A Language H/K/M/Tam/Tel	2	2	1	2	4	50%	50%
5	3	AEC 2A English	2	2	1	2	4	50%	50%
6	4	Language across the curriculum	3	3	1	2	5	50%	50%
7	2	Environmental education	1	1	1	2	3	50%	50%
Total	**24**		**17**	**17**	**7**	**14**	**31**		

TABLE 3: Semester II (Credits: B.A.12; AEC 6; B.Ed. 6; Total 24)

Course No.	Total Credits (V)	Courses	Credits Theory (L)	Teaching Hours per week (L)	Credits: Practicum/al (Lab/Field) (T/P)	Practicum/al Hours per week (T/P)	Total Hours per week (L+T+P)	Periodic Assessment C1+C2	Terminal Assessment C3
1	4	Core Course 1B English Literature	3	3	1	2	5	50%	50%
2	4	Core Course 2B History	3	3	1	2	5	50%	50%
3	4	Core Course 3B Geography/ Political Science	3	3	1	2	5	50%	50%
4	3	AEC 1B Language H/K/M/Tam/Tel	2	2	1	2	4	50%	50%
5	3	AEC 2B English	2	2	1	2	4	50%	50%
6	4	Contemporary Indian Education	3	3	1	2	5	50%	50%
7	2	Yoga Edu., self-understanding & development	1	1	1	2	3	50%	50%
Total	**24**		**17**	**17**	**7**	**14**	**31**		

TABLE 4: Semester III (Credits: B.A.12; SEC 3; B.Ed. 8; Total 23)

Course No.	Total Credits	Courses	Credits Theory (L)	Teaching Hours per week (L)	Credits: Practicum/al (Lab/Field) (T/P)	Practicum/al Hours per week (T/P)	Total Hours per week (L+T+P)	Periodic Assessment C1+C2	Terminal Assessment C3
1	4	Core Course 1C English Literature	3	3	1	2	5	50%	50%
2	4	Core Course 2C History	3	3	1	2	5	50%	50%
3	4	Core Course 3C Geography/ Political Science	3	3	1	2	5	50%	50%
4	3	Skill Enhancement Course 1	2	2	1	2	4	50%	50%
5	4	Childhood & Growing up	3	3	1	2	5	50%	50%
6	2	Gender School & Society	1	1	1	2	3	50%	50%
7	2	School Attachment Programme 1	0	0	2	3 weeks		50%	50%
Total	**23**		**15**	**15**	**8**	**16**	**31**		

TABLE 5: Semester IV (Credits: B.A. 12; SEC 3; B.Ed. 8; Total 23)

Course No.	Total Credits	Courses	Credits Theory (L)	Teaching Hours per week (L)	Credits: Practicum/al (Lab/Field) (T/P)	Practicum/al Hours per week (T/P)	Total Hours per week (L+T+P)	Periodic Assessment C1+C2	Terminal Assessment C3
1	4	Core Course1D English Literature	3	3	1	2	5	50%	50%
2	4	Core Course 2D History	3	3	1	2	5	50%	50%
3	4	Core Course 3D Geography/ Political Science	3	3	1	2	5	50%	50%
4	3	Skill Enhancement Course 2	2	2	1	2	4	50%	50%
5	4	Learning & Teaching	3	3	1	2	5	50%	50%
6	2	Drama & Art Education	1	1	1	2	3	50%	50%
7	2	School Attachment Programme 2	0	0	2	3 weeks		50%	50%
Total	23		15	15	8	16	31		

*** SEC 2 - Skill Enhancement Course 2 –** Each student will select any one of the 4 courses offered.

TABLE 6 : Semester V (Credits: B.A. 12; B.Ed. 12; Total 24)

Course No.	Total Credits	Courses	Credits Theory (L)	Teaching Hours per week (L)	Credits: Practicum/al (Lab/Field) (T/P)	Practicum/al Hours per week (T/P)	Total Hours per week (L+T+P)	Periodic Assessment C1+C2	Terminal Assessment C3
1	4	Core Course1E English Literature	3	3	1	2	5	50%	50%
2	4	Core Course 2E History	3	3	1	2	5	50%	50%
3	4	Core Course 3E Geography/ Political Science	3	3	1	2	5	50%	50%
4	4	Assessment For Learning	3	3	1	2	5	50%	50%
5	4	Pedagogy of English	2	2	2	4	6	50%	50%
6	4	Pedagogy of Social Science	2	2	2	4	6	50%	50%
Total	24		16	16	8	16	32		

TABLE 7: Semester VI (Credits: B.A. 9; DSE 2; B.Ed. 12; Total 23)

Course No.	Total Credits	Courses	Credits Theory (L)	Teaching Hours per week (L)	Credits: Practicum/al (Lab/Field) (T/P)	Practicum/al Hours per week (T/P)	Total Hours per week (L+T+P)	Periodic Assessment C1+C2	Terminal Assessment C3

1	4	Core Course1F English literature	3	3	1	2	5	50%	50%
2	4	Core Course 2F History	3	3	1	2	5	50%	50%
3	4	Core Course 3F Geography/ Political Science	3	3	1	2	5	50%	50%
4	4	Critical Understanding Of ICT	2	2	2	4	6	50%	50%
5	4	Pedagogy of English	2	2	2	4	6	50%	50%
6	4	Pedagogy of Social Science	2	2	2	4	6	50%	50%
Total	**24**		**15**	**15**	**9**	**18**	**33**		

TABLE 8: Semester VII* (Credits: DSE 9; B.Ed. 20; Total 29**)

Course No.	Total Credits	Courses	Credits Theory (L)	Teaching Hours per week (L)	Credits: Practicum/al (Lab/Field) (T/P)	Practicum/al Hours per week (T/P)	Total Hours per week (L+T+P)	Periodic Assessment C1+C2	Terminal Assessment C3
1	3	DSE 1A English literature	1	1	1+1	2+2	5	50%	50%
2	3	DSE 2A History	1	1	1+1	2+2	5	50%	50%
3	3	DSE 3 A Geography/Political Science	1	1	2/1+1	4/2+2	5	50%	50%
4	4	Creating an incl. school	2	2	2	4	6	50%	50%
5	2	Health & Physical Education	1	1	1	2	3	50%	50%
6	2	Reading & reflections On text	1	1	1	2	3	50%	50%
7	6	Internship In School Subject 1-English	0	0	6	10 weeks	-	50%	50%
	6	Internship In School Subject 2-Social Science	0	0	6		-	50%	50%
Total	**29**		**7**	**7**	**22**	**20**	**27**		

*****Semester duration 24 weeks; Instructional duration -14 weeks;

**includes Internship 12 credits.

TABLE 9: Semester VIII (Credits: DSE 9; GE 2; B.Ed. 10; Total 21)

Course No.	Total Credits	Courses	Credits Theory (L)	Teaching Hours per week (L)	Credits: Practicum/al (Lab/Field) (T/P)	Practicum/al Hours per week (T/P)	Total Hours per week (L+T+P)	Periodic Assessment C1+C2	Terminal Assessment C3
1	3	DSE 1B English literature	1	1	1+1	2+2	5	50%	50%

2	3	DSE 2B History	1	1	1+1	2+2	5	50%	50%
3	3	DSE 3B Geography/Political Science	1	1	2/1+1	4/2+2	5	50%	50%
4	2	GE 2 Indian Const. & Human Rights	2	2	0	0	2	50%	50%
5	4	Knowledge & Curriculum	2	2	2	4	6	50%	50%
6	4	Guidance & Counseling	3	3	1	2	5	50%	50%
7	2	Value & Peace Education	1	1	1	2	3	50%	50%
Total	**21**		**11**	**11**	**10**	**20**	**31**		

TABLE 10: PANORAMA OF COURSES IN THE EIGHT-SEMESTERS

Sl. No.	COURSE	CREDITS (L+T+P)								Credits	Credits In Prog.	Total Contact Hours per week (× 16)
		I	II	III	IV	V	VI	VII	VIII			
	CORE COURSES:											
1	English literature	3+1+0	3+1+0	3+1+0	3+1+0	3+1+0	3+1+0	--		18+6+0	24	30
2	History	3+1+0	3+1+0	3+1+0	3+1+0	3+1+0	3+1+0	--	--	18+6+0	24	30
3	Geography/ Political Science	3+0+1 3+1+0	3+0+1 3+1+0	3+0+1 3+1+0	3+0+1 3+1+0	3+0+1 3+1+0	3+0+1 3+1+0	--	--	18+6+0	24	30
	ABILITY ENHANCEMENT COURSES											
1	Language H/K/M/Tam/Tel	2+1+0	2+1+0	--	--	--	--	--	--	4+2+0	6	8
2	English	2+1+0	2+1+0							4+2+0	6	**8**
	SKILL ENHANCEMENT COURSES											
1	Courses 1 & 2	--	--	2+0+1	2+0+1	--	--	--	--	4+0+2	6	8
	DISCIPLINE SPECIFIC ELECTIVES											
1	English Literature							1+2+0	1+2+0	2+4+0	6	5
2	History							1+2+0	1+2+0	2+4+0	6	5
3	Geography/ Political Science							1+1+1 1+2+0	1+1+1 1+2+0	2+2+2 2+4+0	**6**	**5**
	GENERIC ELECTIVE											
1	Environmental Education	1+1+0								1+1+0	2	**3**
2.	Indian Constitution & Human Rights	1+1+0								1+1+0	2	3
	PROFESSIONAL EDUCATION COURSES											
1	Language Across Curriculum	3+1+0								3+1+0	4	5
2	Contemporary Indian Education		3+1+0							3+1+0	4	5
3	Yoga Edu., self-understanding & development		1+0+1							1+0+1	2	3
4	Childhood & Growing up			3+1+0						3+1+0	4	5
5	Gender School & Society			1+1+0						1+1+0	2	3
6*	School Attachment Programme 1			0+0+2						0+0+2	2	3 weeks
7	Learning & Teaching				3+1+0					3+1+0	4	5
8	Drama & Art Education				1+1+0					1+1+0	2	3
9*	School Attachment Programme 2				0+0+2					0+0+2	2	3 weeks
10	Assessment For Learning					3+1+0				3+1+0	4	5
11	Pedagogy of English Language					2+2+0				2+2+0	4	6
12	Pedagogy of Social Science.					2+2+0				2+2+0	4	6

13	Critical Understanding of ICT						2+2+0			2+2+0	4	6
14	Pedagogy of English Language						2+2+0			2+2+0	4	6
15	Pedagogy of Social Science.						2+2+0			2+2+0	4	6
16	Creating an inclusive school							2+2+0		2+2+0	4	6
17	Health &Physical Education							1+0+1		1+0+1	2	3
18	Reading & reflection on text							1+1+0		1+1+0	2	3
19 *	Internship in School Subject 1– English							0+0+6		0+0+6	6	10 Weeks
20 *	Internship in School Subject 2- Social Science							0+0+6		0+0+6	6	
21	Knowledge & Curriculum								2+2+0	2+2+0	4	6
22	Guidance & Counselling								3+1+0	3+1+0	4	5
23	Value & Peace Education								1+1+0	1+1+0	2	3

***= courses which do not have C3 Theory examination**

L : Lectures: 1 credit =1hr/week x 16 weeks
T : Tutorial: 1 credit = 2 hr/week x 16 weeks
P : Practicum/practical = 2 hr/week x 16 weeks
V: Credit value of a course is L+T+P

Note : VII Semester consists of 24 weeks out of which 10 weeks of School Attachment Programme-internship in Teaching will be organized in schools in/outside Mysore. 14 weeks are available for classroom instruction.

7.0 Change of Stream

Once chosen, change of stream is not permitted under any circumstances during the Programme.

8.0 Scheme of Examination

8.1 There shall be a terminal (C3) Examination conducted by the University of Mysore at the end of each semester in Theory and/or Practical as the case may be.

8.2 Detailed Scheme of Examination along with course titles and breakup of marks is given below.

COURSE TITLES AND SCHEME OF EVALUATION

Scheme of Evaluation:

- All the courses will be evaluated for a total of 100 marks in the C1, C2 and C3 pattern.
- C1= 25; C2 = 25 and C3 = 50 will be followed uniformly for all the courses.
- In Courses with both theory and practicals, Theory C3 = 50 & Practical C3 =50
- Courses without a C3 theory are separately indicated in the following table

  X is the marks scored out of 50 in C_3 in Theory
  Y is the marks scored out of 50 in C_3 in Practical
  Z is the marks scored out of 50 in C_3 in Tutorial

TABLE 11 : SUBJECTS AND TITLES OF COURSES IN THE PROGRAMME

SEMESTER	COURSE	CODE	SUBJECT	TITLE
FIRST	**Core course 1A**	BAE I.1	English Literature	Introduction to English Literature and Literary Forms
	Core Course 2A	BAE I.2	History	History of Ancient India

	Core Course 3A	BAE I.3A BAE I.3B	Geography / Political Science	Elements of Geomorphology Political Theory
	AEC 1A	BAE I.4A BAE I.4B BAE I.4C BAE I.4D BAE I.4E	Language	Hindi/ Kannada/ Malayalam / Tamil/ Telugu
	AEC 2A	BAE I.5	English	
	GE 1	BAE I.6		Environmental Education
	Professional Education	BAE I.7		Language Across Curriculum
SECOND	**Core course 1B**	BAE II.1	English Literature	Medievalism, Renaissance and Metaphysical Ages
	Core Course 2B	BAE II.2	History	History of Medieval India
	Core Course 3B	BAE II.3A BAE II.3B	Geography/ Political Science	Climatology Western Political Thought
	AEC 1B	BAE II.4A BAE II.4B BAE II.4C BAE II4D BAE II4E	Language	Hindi/ Kannada/ Malayalam / Tamil/ Telugu
	AEC 2B	BAE II.5	English	
	Professional Education	BAE II.6 BAE II.7		Contemporary Indian Education Yoga Edu., self-understanding & development
THIRD	**Core course 1C**	BAE III.1	English Literature	Restoration, Neo-Classicism, Romanticism and Victorianism
	Core Course 2C	BAE III.2	History	History of Modern India
	Core Course 3C	BAE III.3A BAE III.3B	Geography / Political Science	Oceanography Indian Political Thought
	SEC 1	BAE III.4A	English Literature	Film Studies
		BAE III.4B	History	Understanding Heritage
		BAE III.4C BAE III.4D	Geography / Political Science	Representation of Statistical Data Legislative Support
	Professional Education	BAE III.5 BAE III.6 BAE III.7		Childhood &Growing up Gender School & Soc. School Attachment Programme 1
FOURTH	**Core course 1D**	BAE IV.1	English Literature	Twentieth Century British Literature
	Core Course 2D	BAE IV.2	History	History of Post-Independent India
	Core Course 3D	BAE IV.3A BAE IV.3B	Geography / Political Science	Geography of India Comparative Government & Politics
	SEC 2	BAE IV.4A	English Literature	Theatre Studies
		BAE IV.4B	History	Archives and Museums
		BAE IV.4C BAE IV.4D	Geography / Political Science	Disaster Management Public Opinion and Survey Research
	Professional Education	BAE IV.5 BAE IV.6 BAE IV.7		Learning & Teaching Drama & Art Education School Attachment Programme 2
FIFTH	**Core course 1E**	BAE V.1	English Literature	Literacy Criticism and Critical Theory
	Core Course 2E	BAE V.2	History	Historiography
	Core Course 3E	BAE V.3A BAE V.3B	Geography / Political Science	Regional Geography of Asia and Europe Indian Government and Politics
	Professional Education	BAE V.4 BAE V.5 BAE V.6		Assessment For Learning Pedagogy of English Pedagogy of Social Science
SIXTH	**Core course 1F**	BAE VI.1	English Literature	American Literature
	Core Course 2F	BAE VI.2	History	Making of Modern World
	Core Course 3F	BAE VI.3A BAE VI.3B	Geography / Political Science	Regional Geography of America, Australia and New Zealand International Relations

	Professional Education	BAE VI.4 BAE VI.5 BAE VI.6		Critical Understanding of ICT Pedagogy of English Pedagogy of Social Science
SEVENTH	**Discipline Specific Elective 1**	BAE VII.1	English Literature	Modernism, Post-Modernism, Structuralism and Post-Structuralism
		BAE VII.2	History	Contemporary World
		BAE VII.3A BAE VII.3C	Geography / Political Science	Introduction to GIS and Remote Sensing Public Administration
	Professional Education	BAE VII.4 BAE VII.5 BAE VII.6 BAE VII.7A BAE VII.7B		Creating an inclusive school Health & Physical Education Reading & reflection on text Internship in School Subject : English Internship in School Subject: Social Science
EIGHTH	**Discipline Specific Elective 2**	BAE VIII.1	English Literature	New Literatures
		BAE VIII.2	History	Aspects of Regional History and Culture
		BAE VIII.3A BAE VIII.3B	Geography / Political Science	Human Geography Panchayati Raj Institutions in India
	Generic Elective 2	BAE VIII.4		Indian Constitution and Human Rights
	Professional Education	BAE VIII.5 BAE VIII.6 BAE VIII.7		Knowledge & Curriculum Guidance & Counselling Value & Peace Education

8.3 Duration of semester end examination for all theory courses will be 2 hours and for practical examination, it is 3 hours.

Each theory paper comprises of 5 questions of 10 marks each with internal choice covering the entire syllabus.

9.0 Question paper setting, valuation, declaration of results, challenge valuation and all other examination related issues will be as per the rules and procedures followed by the University of Mysore.

9.1 Question paper setting for C_3.

(i) There shall be a separate Board of Examiners for each subject approved by the University, for preparing, scrutinizing and approving the question papers and scheme of valuation for use in the examination/s.

(ii) The question papers shall be drawn from the question bank, through a computer.

9.2 Coding of Answer Scripts:

Before valuation, the answer scripts shall be coded using false numbers. For each paper code separate false number shall be given.

9.3 Valuation and Classification of Successful Candidates

All papers including practicals will be valued by an internal examiner and there will be single valuation.

The performance of a student in a course will be assessed for a maximum of 100 marks as explained below.

A semester is divided into three discrete components namely C_1, C_2 and C_3. The evaluation of the first component C_1 will be done during the first half of the semester when the first the I and II units of the syllabus are covered. This will have a weightage of 25%. The scores will be consolidated during the 8^{th} week of the semester. The evaluation of the second component C_2 will be done during the second half of the semester when units III and IV of the syllabus are covered. This will have a weightage of 25%. This will be consolidated during the 16^{th} week of the semester. In general,

C_1, and C should be evaluated through Test/seminar/dissertation/Presentation / assignment

Between the 18th and 20th week of the semester, the semester end examination will be conducted by the University and this forms the third component of evaluation, C_3 with weightage of 50%.

If a candidate has not scored at-least 30% in C_1 and C_2 put together, he/she is **not allowed** to appear for C_3.

It should be noted that evaluated papers/assignments of C_1 and C_2 assessments are immediately returned to the candidates after obtaining acknowledgement in the register maintained by the concerned teacher for this purpose.

For the courses that has both Theory and Practical components, as part of C_3, both theory and practical examinations shall be conducted for 50 marks each.

The final marks of a course, M of C_3,will be computed as per the following table :

	Credit Distribution patterns	Formula for calculating M
1.	L : T : P	M = ((L+T)*X+ (P*Y)) / (L+T+P))
2.	L : T : P = 0	X
3.	L : T = 0 : P	(L*X + P*Y) / (L+P)
4.	L = 0 : T : P	Y
5.	L : T = 0 : P = 0	X
6.	L = 0 : T = 0 : P	Y
7.	L = 0 : T : P = 0	Z

where

X is the marks scored out of 50 in C_3 in Theory

Y is the marks scored out of 50 in C_3 in Practical

Z is the marks scored out of 50 in C_3 in Tutorial

The total marks in a course is $P = C_1 + C_2 + M$ (after rounding to nearest integer. The grade (G) and grade point (GP) will be calculated as follows where V is the credit value of the course:

P	G	GP = V × G
90 – 100	10	V × 10
80 – 89	9	V × 9
70 – 79	8	V × 8
60 – 69	7	V× 7
50 – 59	6	V × 6
40 – 49	5	V × 5
30 – 39	4	V ×4
0 -29	0	V × 0

If a candidate scores in **$C_1 + C_2 \geq 30\%$, $M \geq 30\%$ M and $G \geq 5$** in a course, then he is considered to be successful in that course.

After successful completion of the required number of credits, then the overall cumulative grade point average (CGPA) of a candidate is calculated using the formula CGPA = ΣGP / Total number of credits and the class is declared as follows :

	FGP	
CGPA	Numerical Index	Qualitative Index
$4 \leq CGPA < 5$	5	Second Class
$5 \leq CGPA < 6$	6	
$6 \leq CGPA < 7$	7	First Class
$7 \leq CGPA < 8$	8	
$8 \leq CGPA < 9$	9	Distinction
$9 \leq CGPA \leq 10$	10	

Overall percentage = 10 * CGPA or is said to be 50% in case CGPA < 5.

However, if **$C_1 + C_2 \geq 30\%$, $M \geq 30\%$ and with grade G = 4,** then a candidate has three options namely conditional success or make up of a course or dropping a course.

Conditional Success: A candidate is said to be successful conditionally in a course if his score in $C_1 + C_2 \geq 30\%$, $M \geq 30\%$ and grade G = 4. But this benefit will be available up to a maximum of 32 credits for the entire programme of B.A.B.Ed. of 4 years. The candidate has to exercise this option within 10 days from the date of notification of results.

Make Up of a Course: Under the following circumstances, a candidate can have an option to choose MAKE-UP OPTION for C_3:

1. scores $\geq 30\%$ in $C_1 + C_2$ and $M < 30\%$
2. scores $\geq 30\%$ in $C_1 + C_2$; $M \geq 30\%$ but with grade G = 4

The candidate has to exercise this option within 10 days from the date of notification of results. Once he has chosen the option he has to write the examination which will be conducted within 25 days from the date of notification of results or as directed by the University. There can be two or more examinations on the same day and they may be held on Saturdays and Sundays also.
If the candidate is unsuccessful in make-up, also then he/she is deemed to have withdrawn / dropped the course.

Dropping a Course and Re-registration

Under the following circumstances a candidate is said to have DROPPED a course,
If the candidate :

1. fails to put in 75% attendance in a course,
2. decides to discontinue/ withdraw from the course,
3. scores less than 30% in $C_1 + C_2$ together,
4. scores in
   i) $C_1 + C_2$ is $\geq 30\%$ and $M < 30\%$ or
   ii) $C_1 + C_2$ is $\geq 30\%$, $M \geq 30\%$ and Grade $G = 4$ and exercises option to drop the course within 10 days from the date of notification of final results,
5. is unsuccessful in the MAKE-UP examination.

6. A candidate who has dropped a course has to **re-register** for the course when the course is offered again by the Institute.

9.4 Each student can go with a normal pace of 24 credits per semester. However, he/she has provision to go with a slow pace of 20 credits per semester and an accelerated pace of 28 credits per semester. In any case, it should not exceed 28 credits including re-registered courses.

9.5 The tuition fee and the examination fee of a semester will be in accordance with the number of credits registered by each student in that semester.

9.6 The student may avail a maximum of two blank semesters in one stretch. However, he has to pay a nominal fee for maintaining a semester blank to the institution.

10.0 Provision for Appeal

A candidate, if dissatisfied with the grades that he/she has got with a feeling that he/she is unnecessarily penalized can approach the grievance cell with the written submission together with all facts and all the assignments, test papers etc. which were evaluated. He/She can do so before the semester-end examination (based on 2 continuous assessment components already completed) or after the semester-end examination. The grievance cell is empowered to review the grades if the case is genuine and is also empowered to penalize the candidate if his/her submission is found to be baseless and unduly motivated. This Cell may recommend to take disciplinary/corrective action on an evaluator if he/she is found guilty. The decision taken by the Grievance Cell is final.

The Registrar (Evaluation) will be the Chairman and Convener of the Grievance Cell. For every subject there will be one grievance cell. The composition of the Grievance Cell is as follows:

1. The Registrar (Evaluation) ex-officio Chairman/Convener.
2. The Principal
3. The Dean of Instruction.
4. Heads of Concerned Departments and Sections
5. An external expert in the concerned subject from the PG department of University
5. Additional lady faculty member (in case not covered by 1,2,3,4,6 and 7).
6. Additional faculty member from a minority community (in case not covered by 1,2,3,4,5 and 7)

The appropriate fee as fixed by the University shall be collected from the candidate who goes for an appeal to the Grievance Cell.

11.0 Marks Cards:

11.1 The marks card shall be laminated after affixing the hologram only when a candidate passes all the courses/papers of a particular semester.

12.0 Barring of Simultaneous Study

12.1 No student admitted to a degree course in a college under the jurisdiction of this university, shall be permitted to study simultaneously in any other course leading to a degree (regular/evening/morning) offered by this/any other university.

12.2 If a candidate gets admitted to more than one course, the university shall without giving prior notice cancel his/her admission to all the courses to which he/she has joined.

13.0 Miscellaneous:

13.1 These revised regulations will apply to the candidates admitted for the academic year 2016-17 and onwards for the course mentioned in Regulation 1.0 above.

13.2 Other regulations not specifically mentioned above are as per the Regulations of the University as applicable from time to time.

13.3 Any other issue not envisaged above, shall be resolved by the Vice-Chancellor in consultation with the appropriate Bodies of the University, which shall be final and binding.

SYLLABUS

FIRST SEMESTER

Core Course 1 A : English Literature

BAE I.1 : INTRODUCTION TO ENGLISH LITERATURE AND LITERARY FORMS

Credits: 4 (3L+1T+0P) **Max. Marks: 100**
Contact Hours per week: 5 **C1 +C2: 50**
Exam duration: 2 Hrs **C3: 50**

Objectives:

- To provide the student teacher a comprehensive perspective of different ages, themes, seminal influences, major works and their socio-cultural background from medieval to the modern times.
- To make the student teacher aware of the cardinal literary forms.
- To enlighten the learner on the aesthetics of literature and its perceptible similarities and borrowing from allied themes of artistic expression.
- To make the student teachers conscious the vast and profound humanitarian ethos, ideologies and perceptions of literature.

COURSE CONTENT:

Unit I: **What is literature?**
Ancient and medieval literature, myths and folklore traditions, concept of "Genre"; Ideology and Literature; The ways of reading literature.

Unit II: **Poetry**
Sub-genres of poetry: Ballads, epics, lyrics, sonnet, ode, elegy, pastoral poetry, narrative poems, mock-epic and other indigenous forms of poetry like haiku.
Metrical patterns of poetry; Figures of speech used in poetry.
Wordsworth: Lucy Gray
Milton: On his blindness
Ezra Pound: In a Station of the Metro

Unit III: **Drama**
To introduce students to types of drama, tragedy, comedy, farce, one-act play. To introduce students to dramatic techniques of plot, character, stage, setting, writer, soliloquy.
Jean Anouilh: Antigone

Unit IV: Fiction and Prose
To introduce the students to the language of fiction, point of view, characterization (flat and round), settings, time and space, short fiction. To discuss prose as an agent of social change.
Introduction to psychological novels, regional, historical, detective, bildungsroman, stream of consciousness, gothic, romance, magical realism, diasporic novels.
Dorris Lessing: The Fifth Child
Ernest Hemingway: The Old Man and the Sea
George Orwell: Animal Farm
Somerset Maugham: Moon and Six Pence

References:

1. Aristotle : Poetics
2. Kalidasa : Abhijnana Shakuntala, Tr. Chandra Rajan in Kalidasa. The Loom of Time.
3. Bharata (Calcutta : Natyashastra, Tr. Manmohan Ghosh, Chapter 6 "Sentiments" 2nd edition Granthalaya, 1967) Vol.1, pages 100-118.
4. B Prasad : Introduction to English Literature
5. M.H. Abrams : Glossary of Literary Terms
6. Martin Gray : Dictionary of Literary Terms
7. Lawrence Durrel : Key to Modern Poetry
8. G.S. Fraser : Introduction to Modern Literature
9. Cleanth Brooks &
10. Warren : Understanding Poetry; Understanding Drama; Understanding Fiction

Core Course 2 A : History

BAE I.2 : History of Ancient India

Credits 4 (3L+1T+0P) **Max. Marks: 100**
Contact Hours per week: 5 **C1+C2:50**
Exam duration: 2 Hrs **C 3:50**

Objectives:
The course is designed to help the student teachers to understand:
- importance of literary, archaeological sources for understanding Harappan civilization
- rise of new religions, such as Jainism, Buddhism and their contribution to Indian civilization
- evolution of Mauryan Empire as a welfare state and Ashoka's contribution to Dharma
- cultural contributions of Gupta and the Rajput rulers to literature, science, art and architecture

COURSE CONTENT:

Unit I: Survey of Sources and Geographical Features
Literary and archaeological Sources-Geographical Features-Indus Valley: Civilization-Cities of Harappan civilization: Harappa, Mohenjo-Daro, Lothal and Chanhudaro: The political, economic and religious life of the Indus people-The Aryans-Origin-The Rig Vedic and Later Vedic Periods- political, economic and socio-religious life of the Aryans

Unit II: Sixth century B.C. and the rise of new religions
The sixth century BC in Indian History-Rise of new Religions-Jainism and life and teachings of Mahaveera – Buddhism and life and teachings of Buddha

Unit III: The Mauryan Empire
The Mauryas -Chandragupta Maurya-Asoka-Kalinga War-Welfare State-Asoka's Dharma-Factors for the disintegration- The Indo-Greeks-Kushanas and Kanishka-Conquests-Patronage to Buddhism-Gandhara Art

Unit IV: Guptas and Rajput rulers and their contributions
The Guptas-Samudragupta-Chandragupta Vikramaditya- Gupta's contributions to the field of literature, science, art and Architecture-Revival of Hinduism- Hun invasion- Harshavardhana-

career and achievements; Rajputs-Pratiharas-Chauhans-Paramaras-Chandelas-Society, art and architecture

Maps for Study

1. The Mauryan Empire under Asoka
2. The Kushana Empire under Kanishka
3. The Gupta Empire under Samudragupta
4. The Empire under Harshavardhana

References:

1. Allchin, B. R., *Birth of Indian Civilization*, Penguin Books Ltd., 1995
2. Romila Thapar (Ed.), *Recent perspectives of Indian History*, Oxford University Press, Delhi, 1998
3. -------, *From lineage to state***,** OUP, Delhi, 2000
4. -------, *Asoka and the Decline of the Mauryas*, OUP, Delhi, 1999
5. -------, *History of India-I*, Penguin Books
6. Kosambi, D.D.,*The culture and civilization of Ancient India-An historical outline***,** Vikas, New Delhi, 1997
7. Basham, A. L., *The Wonder that was India (Vol. I)*, Rupa & Co., New Delhi, 1995
8. Basham A. L (Ed.), *A Cultural History of India*, OUP, Delhi, 1998
9. Jha, D N., *Ancient India-An Introductory Outline*, People's Publishing House, New Delhi
10. Sharma, R. S., *Indian Feudalism***,** Mac Milan, Madras, 1998
11. Sharma, R. S, *Material Culture and Social formation in Ancient India*, Mac Milan, Madras, 1995
12. Sharma, R.S., *Aspects of Political Ideas and Institutions in Ancient India*, Motilal Banarsidas, Delhi, 1999
13. Luniya, B N, *Evolution of Indian Culture*, Agra, 1977
14. Devahuti D, *Harsha-A Political Study*, OUP, Delhi, 1998
15. Majumdar R.C., *Ancient India*, Motilal Banarsidas, Delhi, 1982
16. Sen, Amartya, *The Argumentative Indian*: *Writings on Indian Culture, History and Identity,* Penguin India, 2006
17. Sharma, R.S., *India's Ancient Past*, Oxford University Press, 2005.

Core Course 3A : Geography

BAE I.3A : ELEMENTS OF GEOMORPHOLOGY

Credits: 4 (3L+0T+1P) **Max. Marks: 100**
Contact Hours per week: 5 **C1 +C2: 50**
Exam duration: 2 Hrs **C3: 50**

Objective:
The major objective of this course is to introduce the nature of geography and the concepts of physical geography, essentially geomorphology to the students of geography in a brief but adequate manner.

COURSE CONTENT:

Unit I: The Earth
The Nature, Scope and Content of Geomorphology, the Solar System, Origin of the Earth: Big Bang Theory. The Earth: Shape, Size, radius and Circumference. Parallel of latitudes and meridians of longitude. Geological Time Scales

Unit II: Earth's Movements
Interior of the Earth, Composition and structure. Origin of the continents and the Ocean Basins. Wegner's Theory of Continental Drift. Theory Plate Tectonics.

Unit III: Rocks and Internal Movements
Origin, Classification and Characteristics of Rocks. Internal Movements: Definition, Causes, Classification of movements: 1) Slow Movements: Folding and faulting, 2) rapid Movements: Volcanism and Earthquakes.

Unit IV: Geomorphic Process
Geomorphic agents and processes: Erosion, Transportation and Deposition. Weathering: Mechanical, Chemical, biological, Anthropogenic. Evolution of landscape: Fluvial, Aeolian, Glacial, and Karst topography.

References:

1. Dikshit R.D.: The Arts, Science of Geography Integrated Readings, Prentice Hall of India, New Delhi,1994.
2. Dohrs,F.E.and Sommers,L.W.(eds.)Introduction to Geography, ThomasY. Crowell Co., New York,1967.
3. Hartshorne, Richard: Perspective on the Nature of Geography, Rand McNally and Co., Chicago, 1959.
4. Harvey,David: Explanation in Geography, Edward-Arnold, London, 1972.
5. Holt-Jensen,A.: Geography: Its History and Concepts, Longmans, 1980.
6. Dayal, P; A Text book of Geomorphology. Shukla Book Depot, Patna, 1996.
7 Dury, G.H.: The Face of the Earth, Penguins, 1980.
8. Ernst,W.G.: Earth systems-Process and Issues. Cambridge University Press, 2000.
9. Kale V. and Gupta, A: Element of Geomorphology, Oxford University Press, Calcutta, 2001. Curriculum Development Committee in Geography 40
10. Monkhouse, F.J.: Principles of Physical Geography. Hodder and Stoughton, London.1960
11. Pitty. A.: Introduction to Geomorphology, Methuen, London, 1974.
12. Singh,S. :Geomorphology,Prayag Pustakalaya, Allahabad,1998.

13. Small, R.J.: TheStudyofLandforms, Mc.GrawHill, New York, 1985.
14. Sparks, B.W.: Geomorphology, Longmans, London, 1960.
15. Steers,J.A.: The Unstable Earth.Some recent views in Geography,Kalyani Publishers, New Delhi, 964
16. Strahler, A.N.and Strahler, A.H.: Modern Physical Geography; John Wiley & Sons, Revised edition 1992.
17. Summerfield, M.A.: Global Geomorphology, Longman, 1991
18. ThornburyW. D.: Principles of Geomorphology,Wiley Eastern, 1969.
19. Wooldridge,S.W.and Morgan,R.S.: The Physical Basis of Geography-An Outlineof Geomorphology,: Longman Green & Co.,London, 1959.
20. Wooldrige,S.W: The Geographer as Scientist. Thomas Nelson and Sons Ltd., London, 1956.

PRACTICALS

ExamDuration: 3 hrs **C_3.50**

COURSE CONTENT:

Maps and Scales

1. **Scales**: Meaning,significance, Types:statement, RF, Graphical Scale conversion of scales: Statement Scale to R.F. and R.F. to Statement Scale, Construction of the Graphical Scales: Plain Scales, Comparative Scales, Speacial Type Scale, Diagonal and Vernier Scale
2. **MeaningandclassificationofMaps**–Atlas,Wall Maps,Topographical, Cadastral Maps, Physicaland Cultural maps. Latitudes and Longitudes. Time and Date Line.
3. **Analysis of Geological Maps**
   Construction of Geological Section of Horizontal, Uniclinal, Folded and Faulted Structures Along with Igneous Intrusions and Line of Unconformity.
   Succession and Relation with Rock Groups. Topography and its Relation with Underlying Structures. Interpretation of Geological History

References:

1. GopalSingh, Map work and Practical Geography, III Ed.,Vikas Publishing House, New Delhi.
2. Gupta,K K and Tyagi V C,Working with Maps, Survey of India, Department of Science and Technology, Government of India, DehraDun 1992.
3. Jackie Smith B.A.(Ed), Dictionary of Geography, Cosmo Publications, New Delhi, 1983.
4. John and Keats, Cartographic Design and Production,II Edition,1989, John Wiley, New York.
5. Mishra R P, Fundamentals of Cartography, 1969, Prasaranga, University of Mysore, Mysore.
6. Monkhouse F.J.and Wilkinson, H.R.,Maps and Diagrams,Mathuen and Co. Ltd.,London, 1952.
7. Phyllis Dink, Map Work, X (Ed) Atma Ram and Sons, Delhi, 1967.
8. Raisz E, General Cartography, 1948, Tata McGraw Hill, New York

Core Course 3 A : Political Science

BAE I.3B: POLITICAL THEORY

Credits: 4 (3L+1T+0P) **Max. Marks: 100**

Contact Hours per week: 5 **C1 +C2: 50**
Exam duration: 2 Hrs **C3: 50**

Objectives: after completing the course the student teachers will be able to understand and comprehend:

- meaning, nature and significance of political theory
- meaning, nature, evolution, characteristics, kinds and theories of sovereignty
- meaning, nature, evolution, characteristics, kinds and theories of sovereignty
- meaning, sources and kinds of law, justice and political organization

COURSR CONTENT

Unit I: Political Theory

Meaning-Nature and Significance of political theory, State-meaning, origin, elements and theories (social contract theory, evolutionary theory, force theory and organic theory), power, authority and legitimacy.

Unit II: Sovereignty

Meaning, Nature, evolution of Sovereignty, characteristics, kinds and theories of Sovereignty (monism and pluralism).

Unit III: Rights, Liberty and Equality

Rights: meaning, nature, importance and kinds of rights, **Liberty:** Meaning, nature, importance and kinds of liberty, **Equality:** meaning, nature, importance and kinds of equality, relationship between liberty and equality.**Unit IV: Law, Justice and Political Obligation**

Law: meaning, sources and kinds of law, **Justice:** meaning, importance and theories of justice (John Rawls, Robert Nozick), **Political Obligation:** meaning and Theories of political obligation.

References

1. Agarwal R.C., *Political Theory,* S. Chand Company Ltd, New Delhi, 2004.
2. Bhagwan Vishnoo, and Bhushan Vidya, *Principles and Concepts of Political Theory*, Kalyani Publications, New Delhi, 2005.
3. Gokhale, B.K., *A Study of Political Theory*, Himalaya Publishing House, New Delhi, 1979.
4. Varma, S.P., *Political Theory,* (3rd revised Edition) Vikas Publishing House, New Delhi, 1983.
5. Vinod, M.J., and Deshpande Meena, *Contemporary Political Theory*, PHI, Learning Pvt Limited New Delhi, 2013.

Ability Enhancement Course - AEC 1 A : Language

BAE I.4A : HINDI

Credits 3 (2L+1T+0P) **Max. Marks: 100**
Contact Hours per week: 4 **C1+C2:50**
Exam duration: 2 Hrs. **C 3: 50**

Objectives:

- To enable the students to acquire basic skills in functional language.

- To develop independent reading skills and reading for appreciating literary works.
- To internalise grammar rules so as to facilitate fluency in speech and writing.
- To develop functional and creative skills in language.
- To develop values of liberalism and an insight into the cultural heritage of the region which remains embodied in the literary output of the region.

COURSE CONTENT:

Unit I: Functional language
Prayojanmoolak Hindi: Saidhantik Pakchh
Prayojanmook Hindi: Zaroorat, Swaroop, Visheshtayen, Prayukti ke Madhyam, Mukhya tatwa-Paribhashik Shabdavali aur Anuvad, Simayen aur Smabhavnayen,

Unit II: Communication skills
Samooh Charcha (Group discussion): Introduction – Definition – Characteristics – Types of Discussion –Round table, Symposium, Lecture forum etc. – Relevance of Group Discussion – Exercises.
Sachhatkar (Interview): Characteristics – Definition – Types of Interviews – Preparation for Interview –Models – Exercises.

Unit III: Collection of Poetries:
Maithilisaran Gupt- Nar Ho Na Nirash Karo Man ko
Jayshankar Prasad- Himadri Tung Sring Se Prabudh Sudhha Bharti
Suryakant Tripathi Nirala- Joohi ki Kali
Sumitranandan Pant- Drut Jharo Jagat Ke Jirn Patra
Mahadevi Verma-Mai Neer Bhari Dhukh Ki Badli,
Sacchidanand Heeranad Vatasyayan Aggey-Kalgi Bajre Ki
Gajanan Madhav Muktibodh- Bhool Galti,
Kedarnath Agrawal- Chandra Gahna Se Lautati Ber
Nagarjun- Aakal Aur Uske Bad
Kedarnath Singh- Aakal Me Saras

Unit IV: Collection of Short Stories:
Chandradhar Sharma Guleri- Usne Kaha Tha
Jayshankar Prasad- Puraskar
Premchand- Panch Parmeshwar
Aggey-Gaingreen (Rooj)
Phanishwar Nath Renu- Teesari Kasam
Bhism Sahani- Cheef ki Dawat
Krisna Sobti-Dadi Amma
Sudha Aroda-Annapurna Mandal Ki Aakhiri Chitthi
Maitreyee Pushpa- Goma Hasti Hai
Omprakash Valmiki- Shavyatra

References:

1. Bhasha, Yugbodh aur Kavita: Dr Ramvilas Sharma, Vani Prakashan, Delhi
2. Kavita ka Vartmaan: Dr P Ravi, Vani Prakashan, Delhi
3. Hindi Kvaya ka Itihas: Ramswaroop Chaturvedi, Lokbharti Prakashan, Delhi
4. Kavita ki Zameen aur Zameen ki Kavita: Namvar Singh, Rajkamal Prakashan, Delhi
5. Naee Kavita aur Astitvawad: Ramvilas Sharma, Rajkamal Prakashan,Delhi
6. Chhayavad: Namvar Singh, Rajkamal Prakashan, Delhi
7. Hindi Kavita ka Atit aur Vartmaan: Maneger Panday, Vani Prakashan, Delhi

8. Hindi Kahani- Antarang Pahchan: Dr Ramdars Mishra, Vani Prakashan, Delhi
9. Hindi Kahani-Sanrachana aur Samvedana: Dr Rachna Saah, Vani Prakashan, Delhi
10. Galp Ka Yatharth-Kathaloochan ke Aayam: Suvas Kumar, Vani Prakashan, Delhi
11. Hindi Ka Gadyaparva: Namvar Singh, Rajkamal Prakashan,Delhi
12. Sahitya ki Pahchan: Namvar Singh, Rajkamal Prakashan,Delhi
13. Katha Vivechan aur Gadyashilp: Ramvilas Sharma, Vani Prakashan, Delhi
14. Kahani Anubhav aur Abhivyakti: Rajendra Yadav, Vani Prakashan, Delhi
15. Kahani- Swaroop aur Samvedana: Rajendra Yadav, Vani Prakashan, Delhi

BAE I.4B: KANNADA

Credits 3 (2L+1T+0P) **Max. Marks: 100**
Contact Hours per week: 4 **C1+C2:50**
Exam duration: 2 Hrs. **C 3: 50**

Objectives:

- To enable the students to acquire basic skills in functional language.
- To develop independent reading skills and reading for appreciating literary works.
- To internalize grammar rules so as to facilitate fluency in speech and writing.
- To develop functional and creative skills in language.
- To develop values of liberalism and an insight into the cultural heritage of the region which remains embodied in the literary output of the region.

COURSE CONTENT:

Unit I: Descriptive Grammar
Sandhi (Agama, Adesa, Dwitva, etc) A suitable grammar book on Sandhi will be followed in the classroom.

Unit II: Functional Language
Group Discussion: Introduction – Definition – characteristics – types of discussions – round-table symposium – panel – lecture forum etc. – relevance of Group Discussion – exercises.

Conversation: Definition – styles of conversation – formats of conversation – telephonic conversation, etc. – Exercises

Unit III: Modern Poetry
i) Kalki – Kuvempu
ii) Thilisaru-Videhi
iii) Balegaarana Haadu –K S Narashimha Swamy
iv) Nanna nayi- Pu Thi Na
v) Nanna avathara – M Gopalakrishna Adiga
vi) Puttavidhave –DA. RA.Bendre
Selected from Aunika Kannada Kavya Part I, University of Mysore.

Unit IV: Prose: Collection of short stories
Collection of Short Stories
i) Danbaru Banbudu- Devanuuru Mahadeva
ii) Kallina Kolalu – Chaturanga
iii) Rotti- P Lankesh
iv) Cappaligalu – Sara Abubakkar
Selected from Sanna Kathegalu, Mysore University, Mysore

References:
1. Kannada Kaipidi, Prasaranga Publication, University of Mysore.
2. Effective Group Discussion – Theory and Practice by Gloria J.Galanes, McGraw Hill Company (Publishers).

BAE I.4C : MALAYALAM

Credits 3 (2L+1T+0P) **Max. Marks: 100**
Contact Hours per week: 4 **C1+C2:50**

Exam duration: 2 Hrs. **C 3: 50**

Objectives:

- To enable the students to acquire basic skills in functional language.
- To develop independent reading skills and reading for appreciating literary works.
- To internalize grammar rules so as to facilitate fluency in speech and writing.
- To develop functional and creative skills in language.
- To develop values of liberalism and an insight into the cultural heritage of the region which remains embodied in the literary output of the region.

COURSE CONTENT:

Unit I : **Descriptive Grammar - Sandhi**

Unit II: Functional Language

Group Discussion- Introduction – Definition – characteristics – types of discussions – round-table symposium – panel – lecture forum etc. – relevance of Group Discussion – exercises

1. Conversation - Definition – styles of conversation – formats of conversation– telephonic conversation, etc. – Exercises

Unit III: Modern Poetry

Lessons from "Kavya Mala, University of Kerala Publications, Kerala
Mazhuvinte Katha
Sabhalamee yaatra
Shanta
Kochiyile Vrikshangal
Bharatheeyam

Unit IV: Literature

Collection of Short Stories:
From Katha malika, University of Kerala publications
Kadal theerathu
Shavadaham
Ammayum makanum
Perumazhayude pittennu
Chaya

References:

1. Kerala Panineeyam by A R Rajaraja Varma, NBS, Kottayam
2. Effective Group Discussion – Theory and Practice by Gloria J.Galanes, McGraw Hill Company (Publishers).

BAE I.4D : TAMIL

Credits : 3 (2L+1T+0P) **Max. Marks: 100**
Contact Hours per week: 4 **C1+C2:50**
Exam duration: 2 Hrs. **C 3: 50**

Objectives:

- To enable the students to acquire basic skills in functional language.

- To develop independent reading skills and reading for appreciating the literary works
- To internalize grammar rules so as to facilitate fluency in speech and writing
- To develop functional and creative skills in language.
- To develop value of liberalism and an insight into the cultural heritage of the region which remains embodied in the literary output of the region.

COURSE CONTENT:

Unit I: Descriptive grammar – Sandhi

Unit II: Functional Language
Group Discussion: Introduction-Definition-Characteristics-types of discussions-round table-symposium-panel-lecture forum etc.-relevance of group Discussions –Exercises
Conversation: Definition-Styles of conversation-formats of conversation-telephonic conversation, etc-Exercises
.
Unit III: Poetry - Modern Poetry
Ikkalak Kavithaikal, Kannan En Sevegan, Thiru Arutpa, An Anthology of Tamil Poetry

Unit IV: Prose: Collection of Short Stories
Naatru – (Collection of Short Stories)

References:
1. Tamil Ningalum Thavarillamal Ezuthalam- Dr. Porko
2. Efective Group Discussion – Theory and Practice, Gloria J. Galanes, McGraw Hill Company (Publishers)
3. Naatru, Vaanathi Pathippagam, 13 Deenadayalu Street, T. Nagar, Chennai 600 017

BAE I.4E : TELUGU

Credits 3 (2L+1T+0P) **Max. Marks: 100**
Contact Hours per week: 4 **C1+C2:50**
Exam duration: 2 Hrs. **C 3: 50**

Objectives:

- To enable the students to acquire basic skills in functional language.
- To develop independent reading skills and reading for appreciating the literary works
- To internalize grammar rules so as to facilitate fluency in speech and writing
- To develop functional and creative skills in language.
- To develop value of liberalism and an insight into the cultural heritage of the region which remains embodied in the literary output of the region.

COURSE CONTENT:

Unit I : Functional language (Styles and Registers):

1. Letter writing: Characteristics – Definition – Types of Letters – E-mails – Language of Letters –Exercises
2. NEWS Reporting: Characteristics – Definition – Language of NEWS Reporting - Models – Role of Median NEWS Reporting – Exercises.

Unit II: Communication skills (Effective speaking and effective writing) in language:

1. Group discussion: Introduction – Definition – Characteristics – Types of Discussion – Round table, Symposium, Lecture forum etc. – Relevance of Group Discussion – Exercises.
2. Interview: Characteristics – Definition – Types of Interviews – Preparation for Interview – Models – Exercises.

Unit III: Modern Poetry and Folk literature

1. Desha Charitralu – Sree Sree (From Maha Prasthanam, Visalandhra Publications, Hyderabad).
2. Folk Songs from 'Rayalaseema Raagalu' & 'Triveni' Published by Telugu Academy, Hyderabad

Unit IV: Genre of literature (Piece of a Drama/Portion of Autobiography)
Selected scenes from drama '**Kanyashulkam'** by Gurazada Apparao (available at Visalandhra Publication, Hyderabad.

References:

1. A Hand book of writing activities, Prasaranga, University of Bangalore.
2. The perfect Interview by Max Eaggert, Random House, UK.,
3. Interview Secrets by Heather Salter, Publications: Collins, London,
4. Effective Group Discussion – Theory and Practice be Gloria J.Galanes, McGraw Hill Company.
5. Fundamentals of Journalism, Report Writing and Editing by R. Thomas Berner, Marquette Books, LLC, Washington.
6. Effective Communication Skills, by Omkar N Kour

Ability Enhancement Course 2A : English

BAE I.5 : LANGUAGE PROFICIENCY IN ENGLISH

Credits 3 (2L+1T+0P) **Max. Marks: 100**
Contact Hours per week: 4 **C1+C2:50**
Exam duration: 2 Hrs. **C 3: 50**

Objectives:
Students develop proficiency in English which equips them to:
- understand the demands of audience, subject, situation and purpose and the use of language for effective communication.
- analyse language in context to gain an understanding of grammar, vocabulary, spelling, punctuation and speech.
- examine authentic literary and non-literary texts and develop insight and appreciation.
- gain an understanding of study and reference skills.
- plan, draft, edit and present a piece of writing.

COURSE CONTENT:

Unit I: Descriptive Grammar
1. Tenses:

Simple Present: Habitual action, General truths, Future time, Verbs of state, Verbs of perception, Verbs of sensation, Narration, Use of simple present for demonstration and commentaries, Present perfect, present perfect continuous, Present continuous also indicative of future action.
Simple past: Past time reference, Present time reference, Future time reference, Past continuous, Past perfect, past, perfect continuous

Unit II: Skills in Communication
Negotiating a point of view – learning to talk persuasively so as to get across one's perspective.
Debating on an issue – agreeing / disagreeing.

Unit III: Study and Reference Skills
Note making; Note- taking; Summary writing.
Comprehension Skills
Extracts from literary, scientific and educational journals.

Unit IV: Skills of Communication
Advanced Writing Skills, writing advertisement copy; Writing a project proposal and Writing Resume, sending an application.
Listening effectively; Talking about one self (likes, dislikes, interests, beliefs, personality traits, ambitions); Expressing an opinion about personal belief on a current issue. (Ability to speak fluently for 3-4 minutes. Focus would be on organized, logical, sequential presentation of thought through spontaneous speech).

Suggested Activities:
- Politeness competitions- students with partners take turns in using a given number of utterances for negotiation / requests/complaints/small talk.
- Students introduce themselves though using symbols/ metaphors.
- Students collect newspaper/magazine cuttings on topical and/ or cultural issues of interest-write and share their opinion with peers.

References:

1. Block, C.C. (1997). Teaching the Language Arts, 2nd Ed. Allyn and Bacon
2. Mckay. et al. (1995). The Communication Skills Book, 2nd Ed. New Harbinger Publications.
3. Hornby, A.S.(2001).Oxford Advanced Learner's Dictionary, OUP
4. Thomsan, A.J. & Martinet.(2002).A Practical English Grammar. OUP

GENERIC ELECTIVE 1

BAE I.6 : ENVIRONMENTAL EDUCATION

Credits: 2 (1L+ 1T +0P) **Marks: 100**
Contact hrs per week: 3 **C1 + C2: 50**
Exam Duration: 2 hrs **C3: 50**

Objectives

The student-teacher will be able to:

- Develop awareness and concern for environmental issues and sustainable development.
- Acquaint with the concept, objectives and importance of Environmental Education (EE).
- Introduce multi-disciplinary approach to environmental problems.
- Acquaint how to design, develop and implement strategies for Environmental Education (EE).
- Acquaint with the different methods and techniques of teaching Environmental Education (EE).
- Undertake practical activities for school cleanliness, neighbourhood cleanliness drive, and healthy personal hygiene in relation to Swachh Bharat and healthy living. (These activities would have been observed and practiced during the 16-week Internship in schools)
- Inculcate environment friendly values through EE.

COURSE CONTENT

Unit I : Meaning and Concepts

Meaning as evident from Indian literature and contemporary texts, Definition, Objectives, Importance of EE with special reference to Indian view of life and sustainable development Sustainable Development Goals.

Unit II: Basic Environmental Concepts

Ecosystem, Biotic and Abiotic factors, Inter-relationship, Factors affecting environment, population, air, water, soil, noise; Acid rain, Greenhouse effect, Extinction of species, Soil erosion, Energy crisis, Environment and sustainable development; Role of specially designed strategies for cleanliness, Role of mass media and technology in developing awareness about environmental problems and its prevention, Role of NGO and governmental organizations in developing EE.

Unit III: Curriculum, Methods and Techniques of EE

Designing, developing strategies for EE, Evaluation of EE resources materials; Field trips, Role play, Poster presentation, Quiz, Debate, Projects, Swachh Bharat Abhiyan sustainability

Unit IV: Value Development through EE as in Indian View of Life

Practical work in relation to school cleanliness and neighbourhood watch, Text book evaluation for contents on environment and cleanliness, Field trip on environmental degradation, and school and neighbourhood cleanliness, Visit to nature park, industry polluted areas.

Practicum

- Study sustainable development initiative in the country.
- Visits to polluted sites and preparation of report.
- Interviewing people and reporting the inconveniences due to any of the environmental problems.
- To study innovations done by to improve the environment of that area.
- To study the implementation of Environmental Education Programmes in schools/stated country.
- To prepare models and exhibits for general awareness of public regarding environmental hazards.
- To prepare a programme for environmental awareness and school cleanliness, and to conduct the same with school children.
- To visit industries and study alternative strategies of Environmental pollution management.
- To prepare a resource material on any of the environmental problems along with a suitable evaluation strategy. To prepare quizzes and games on environmental issues.
- Organise Swacch Bharat Abhiyan as sustainable activity.
- To study the contribution of NGOs in improving the environment of the city. Classroom. Prepare posters/chart on Sustainable Development Goals.

* In addition, school and community based activities may be organised.

Evaluation Strategies

1. Assignments/sessional work.
2. Unit tests.
3. Portfolio assessment of exhibits, model of charts prepared by student teachers.
4. Seminar presentations followed by group discussion.

References:

1. Trivedi, M.M. and Pathak, Y.P. (1994). *Manav ane Paryavaran: Bhaugolic Paripekshma, University granth Nirman.* Board Publication, Ahmedabad, Gujarat.
2. Garg, B. and Tiwana (1995). *Environmental Pollution and Protection*. New Delhi: Deep & Deep Publication.
3. Sharma, R.C. (1981). *Environmental Education.* New Delhi: Metropolitan Publication.
4. UNESCO, Environmental Education in the light of the Tbilisi Conference, UNESCO.
5. NCERT (2009), *Project Book in Environmental Education from Class I-X*. New Delhi: NCERT.
6. NCERT (2004), *Environmental Education in Schools.* New Delhi: NCERT.
7. Web Resources Towards a Green School on Education for Sustainable Development for Elementary Schools, 2015, NCERT
8. Swachh Bharat Swachh Vidyalaya: A National Mission, Clean India: Clean Schools A Handbook, MHRD.

PROFESSIONAL EDUCATION COURSES

BAE I.7 : Language Across Curriculum

Credits: 4 (3L+ 1T +0P) **Marks: 100**
Contact hrs per week: 5 **C1 + C2: 50**
Exam Duration: 2 hrs **C3: 50**

Objectives:

The student teacher will be able to:

- Understand nature, function and role of different kinds of languages in curriculum transaction
- Acquaint with obstacles in language usage while using the language and ways to overcome them.
- Understand importance and use of first and second language, multilingualism and impact of culture.
- Acquire knowledge about the communication process and verbal and nonverbal communication skills.
- Familiarize the students with of barriers to (Listening, Speaking, Reading, Writing) LSRW skills and activities for developing these skills.

COURSE CONTENT :

Unit I : Nature and Functions of Language

Language – Meaning and Concept, Functions of Language, Role of Language in Curriculum Transaction, Theories of Language Learning, Barriers in Using a Language & Strategies to Overcome them, Verbal and Non-verbal communication

Unit II : Language across Curriculum in the Indian Context

Language as a determinant of Access, Language proficiency and students' attitude towards Learning and Schooling/ dropouts, Language/oral proficiency and critical thinking

Unit III : Strategies for Multilingual Classrooms

Role Plays and Discussions as tools for learning, 'Questioning' to stimulate thought and to encourage and motivate to respond, Preparing Subject/content based exercises in reading, comprehension and usage, Sensitizing, Reflecting and Facilitating, Understanding the learner and his/her language background, Creating sensitivity to the language diversity, Using oral & written language in the classroom for optimal learning

Unit IV : Developing Receptive Skills and Productive Skills

Barriers to Listening Skills, Activities for Developing Listening Skills, Barriers to Reading Skills, Activities for Developing Reading Skills, Barriers to Writing Skills, Activities for Developing Writing Skills, Need and Importance of Classroom Discourse. Barriers to Speaking Skills, Activities for Developing Speaking Skills

Practicum

1. School Visit to Find out Communication Problem/Apprehension in Students
2. Designing Games and Exercises for Developing Listening, Speaking, Reading and Writing Skills

3. Assignments on Developing Writing Skills- Summary, Letter, Paragraph, Essays, Speech
4. Assignments on Developing Speaking Skills – Oral Presentations, Debate, Elocution, Discussion, Brain-storming

Assignments on Developing Listening Skills – Listening to speech, directions

***** In addition, school and community based activities may be organized with provisions for visits to innovative centres of pedagogy and learning, innovative schools, educational resource centres, etc. Action research based on teaching learning and school and community could be conducted.

References:

1. Akmajian, A. et al. (2010). *Linguistics: Introduction to Language and Communication.* (6thed.). Cambridge: MIT Press.
2. Fasold, R. & Connor-Linton, J. (2013). *An Introduction to Language and Linguistics*. (6th ed.). Cambridge: Cambridge University Press.
3. Floyd, K. (2009). *Interpersonal Communication*. New York: McGraw Hill Companies Inc.
4. Fromkin, V., Rodman, R. & Hyms, N. (2011). *Introduction to Language.* (9th ed.). Canada: Cengage Learning.
5. Pearson, J.C. et al (2011). *Human Communication.* (4th ed.). New York: McGraw Hill Companies Inc.

Web Resources

6. First and Second Language Acquisition – A Brief Comparison. Retrieved from https://www.uni-due.de/ELE/FLA_SLA_brief_comparison.pdf
7. Similarities and Differences between First and Second Language Acquisition Retrieved from http://multilingualism.pbworks.com/w/page/21913433/Similarities%20and%20Differences%20between%20First%20and%20Second%20Language%20Acquisition
8. Activities for Developing Speaking Skill Retrieved from http://faculty.weber.edu/ppitts/ed4320/Handouts/speakingskills.htm
9. http://www.educ.ualberta.ca/staff/olenka.Bilash/best%20of%20bilash/speaking.html
10. Activities for Developing Listening Skill Retrieved from http://www.educ.ualberta.ca/staff/olenka.bilash/best%20of%20bilash/listening.html
11. https://blog.udemy.com/listening-skills-exercises/
12. Learning curves: Language Education (2009), by Azim Premji Foundation http://azimpremjifoundation.org/pdf/LCIssue13.pdf
13. Courses on Communication Skills, http://nptel.ac.in/courses/109104030/

SECOND SEMESTER

Core Course 1 B : English Literature

BAE II.1 : MEDIEVALISM, RENAISSANCE AND METAPHYSICAL AGES

Credits: 4 (3L+1T+0P) **Max.Marks: 100**
Contact Hours per week: 5 **C1+C2= 50**
Exam duration: 2 Hrs **C3: 50**

Objectives:

- To introduce student teachers to the Renaissance thought, the major writers who shaped the Renaissance ideology and their influence on the times that followed
- To introduce student teachers to the concept of Humanism, the way the poets, dramatists and novelists of this period shaped their concept of Humanism.
- To introduce student teachers to the cardinal tenets, perceptions and the intense intellectual demands of the Metaphysical school.
- To help student teachers to familiarize themselves with the rigid canons of Puritanism.
- To provide student teachers an insight into major dramatists, themes and techniques of the Renaissance theatre such as Shakespeare, Christopher Marl owe and Ben Jonson. To make them understand the dominant theatrical forms of the Renaissance period such as Tragedies, Comedies and Comedy of Humour.

COURSE CONTENT:

Unit I : Drama
Shakespeare: Hamlet
Shakespeare: Midsummer Night's Dream

Unit II: Drama
Christopher Marlowe: Doctor Faustus
John Webster: Duchess of Malfi

Unit III: Prose
Aristotle: Poetics
Longinus: On the Sublime
Bacon: “Of Studies”; “Of Truth”
Book of Job: Old Testament

Unit IV: Poetry
Chaucer: “The General Prologue
Spenser: “Epithalamion”, Sonnets 30 (“My love is like to ice, and I to fire”) &
75 (“One day I wrote her name upon the strand”)
Donne: “Batter My Heart”; “Death be not Proud”; “The Flea”
Marvell: 'To his coy mistress'

References:

1. Allrdyce Nicoll: History of British Drama
2. Bradley, A.C.: (1968). “Macbeth”, Shakespeare: Macbeth, A Casebook. Ed.John Alain. London: Macmillan, pp.116-130
3. Michael Mangan: (1989) Christopher Marlowe- Doctor Faustus- Penguin Critical

Studies.
4. Kirsch, Arthur: (1990) The Passions of Shakespeare's Tragic Heroes. Charlotte Ville: UP of Virginia.
5. Alaston, Robert.N.: (1987) Ben Jonson's Parodic Strategies: Literary Imperialism in the Comedies, Cambridge, Mass: Harvard University Press.

Core Course 2 B : History

BAE II.2 : HISTORY OF MEDIEVAL INDIA

Credits: 4 (3L+1T+0P) **Max. Marks: 100**
Contact Hrs per week: 5 **C 1+C 2: 50**
Exam Duration: 2 hrs **C3: 50**

Objectives
The course is designed to help the student teachers to understand:
- Delhi Sultanate, Mughal Emperors and their contributions to Indian society
- The nature of Mughal state and its economy
- The advent and the contributions of Maratha rulers
- Rise of monotheistic religion, religious reformers, Sufi saints in Medieval India-Their contributions

COURSE CONTENT:

Unit I: Medieval India: Delhi Sultanate
Literary Sources-Foundation of Delhi Sultanate-Qutb-ud-din Aibak-Iltutmish-Razia Sultana - Ghiasuddin Balban-The Khiljis-Allauddin Khilji-The Tughlaqs-Mohammed bin Tughlaq-theories of Kingship

Unit II: Mughal Empire and the Marathas
Advent of Babar and the foundation of the Mughal Empire-Shershah Sur-Career and Achievements-Akbar-Conquests-Administration-Religious policy- Aurangzeb-Religious policy-Deccan policy- Shivaji-Conquests-Administration-Peshwas-Balaji Vishwanath-Baji Rao I and Balaji Baji Rao- Third battle of Panipat

Unit III: Society and Economy under the Mughals
The Mughal Society and Economy-Contributions to art and architecture

Unit IV: New Religions and Social Reformers of Medieval India
Rise of Monotheistic religions in India-Kabir-Nanak-Sufism-Sheik Nizamuddin Auliya-Sheik Moinuddin Chisti-The saints of Maharashtra-Namdev, Eknath and Tukaram-Rise of Veera Saivism and Vaishnavism in South

Maps for Study:
i) The Khilji Empire under Allauddin Khilji
ii) The Tughlaq Empire under Mohammed bin Tughlaq
iii) Mughal Empire under Akbar
iv) Maratha Empire at its zenith

References:
1. Moreland W.H., *Agrarian System of Moslem India***,** Orient Books, New Anand Pub. Pvt. Ltd., Delhi, 1997
2. Harmann Kulke, *The State in India (1000-1700AD)*, OUP, 1997

3. Irfan Habib, (Ed.),*Akbar and His India*, OUP, New Delhi, 1998
4. Irfan Habib, (Ed.), *Medieval India – 1 (1200-1750)*, Oxford University Press, 1997
5. Irfan Habib, (Ed.), *The Agrarian System of Mughal India (1556-1707 AD)*, OUP, Delhi
6. John F. Richards, *The New Cambridge History of India – The Mughals*, McMilan, Delhi 2000
7. Majumdar, R.C., Roy Chaudhuri & Datta, *Advanced History of India*
8. Mehta J.L., *Advanced Study in the History of Medieval India* (3 vols.)
9. Mohammed Habib, *A Comprehensive History of India, Vol. I*, Delhi
10. Moreland W.H, *From Akbar to Aurangzeb*
11. Mujaffar Alam and Sanjay Subramanyam, The Mughal State (1526-1750), OUP, 1998
12. Qureshi, I. H., Administration of Mughal India, Janaki Prakasana, Patna
13. S.A.A. Rizwi, The Wonder that was India Vol. II, Rupa & Co., New Delhi
14. Satish Chandra,Historiography, Religion, State in Medieval India
15. Satish Chandra, Medieval India from Sultanate to Mughals
16. Streuchand Douglas, The Formation of Mughal Empire, OUP, 1999

Core Course 3 B : Geography

BAE II.3A : CLIMATOLOGY

Credits 4 (3L+T+1P) **Max. Marks: 100**
Contact Hours per week: 5 **C1+C2:50**
Exam duration: 2 Hrs. **C 3:50**

Objectives:
The course of climatology emphasizes the constituents of the atmosphere, the dynamic nature of the processes associated with it and their contribution in making the earth habitable.Thec ourse content also leads to the identification of climatic differentiation on the earth and the consequences of human activities on the atmospheric processes.

COURSE CONTENTS:

Unit I: **Climatology**
Definition and Significance of Climatology, Elements of Weather and Climate and their Significance, Composition and Structureof the Atmosphere.

Unit II: Atmospheric Temperature, Pressure and Winds
Insolation, Vertical and Horizontal distribution of temperature, Seasonal distribution Of temperature, Global Energy Budget. Atmospheric Pressure and Winds: Vertical and Horizontal distribution of Pressure belts, Winds: Planetary, PeriodicandLocal Winds.

Unit III: **AtmosphericMoisture**:
Humidity, Evaporation and Condensation, Precipitation and its types, World patterns of Rainfall, Regional and Seasonal distribution of rainfall.Air Masses and fronts Origin, classification and properties.

Unit IV: Atmospherics Disturbances and Climatic classification
Atmospheric disturbances: Tropical and TemperateCyclones, Thunderstorms and Tornadoes. Anticyclones. Basisof climaticclassification and types. Koppen's classification and types.

References:

1. Barry,R.G.&Chorley,R.J.Atmosphere, Weather and Climate, Routledge, 1998.
2. Critchfield, H: General Climatology, Prentice-Hall, New York, 1975.
3. Das, P.K.: TheMonsoons, National Book Trust, New Delhi, 1968.
4. Lydolph, Paul,E.:The Climate of the Earth,Rowman and Allanheld,Totowa, N.J.,1985.
5. Mather, J.R.: Climatology,McGraw-Hill, New York, 1974.
6. Patterson, S.: Introduction of Meteorology, McGraw-Hill Book Co., London, 1969.
7. Stringer, E.T.: Foundation of Climatology, SurjeetPublications, Delhi, 1982.
8. Trewartha,G.T.: An Introduction to Climate,International Students edition, McGrawHill, New York, 1980.

PRACTICALS

ExamDuration: 3hrs **C_3: 50**

COURSE CONTENT:

1. Methods ofRepresenting relief features: 1) Pictorial Methods: Hachures, Hill Shading. 2) Mathematical Methods: Spot Height, Bench Mark, Trigonometrical Stations, Contours, Form Lines, 3) Combination of Previous Two Methods: Contours, Hachures and Spot Heights. Contour, Form Lines and Spot Heights. Contours and Hill Shading. Contours and Layer tints
2. Drawingofcontour diagrams to represent the followingfeatures. Mountain Hill, Plateau, hillock and Ridge, Escarpment, Pass, Saddle, Spur and Reentrant. Slopes: Uniform, Concave, Convex and Undulating. Valleys: V shaped valley,U shaped valley, Glaciated Valley, Hanging Valley and Water fall. Coastal Features: Cliff, Fiord Coast, Ria Coast, Sand Dunes. Water shade.

References:

1. GopalSingh,Map work and Practical Geography,III Ed.,Vikas Publishing House, New Delhi.
2. Gupta,K K and Tyagi V C,Working with Maps,Survey of India, Department of Science and Technology, Government of India, DehraDun 1992.
3. MishraRP, Fundamentals of Cartography, 1969, Prasaranga, University of Mysore, Mysore.
4. MonkhouseF.J.andWilkinson,H.R., Maps and Diagrams,Mathuena nd Co. Ltd., London, 1952.
5. Phyllis Dink, Map workX (Ed) Atma Ram and Sons, Delhi, 1967.
6. RaiszE, General Cartography, 1948, Tata McGraw Hill, New York.
7. Ranganath, An Introduction to Practical Geography, Part I, Kannada Version, Vidhyanidhi Publications, Gadag 582 101, Karnataka.
8. Robinson, H. Elements of Cartography, John Wiley, London, 1963.
9. Singh,R.L., Elements of Practical Geography, Kalyani

Core Course 3 B : Political Science

BAE II.3 B : WESTERN POLITICAL THOUGHT

Credits: 4 (3L+1T+0P) **Max.Marks: 100**
Contact Hours per week: 5 **C1+C2= 50**

Exam duration: 2 Hrs **C3: 50**

Objectives: after completing the course the student teachers will be able to understand and comprehend the importance of:

- Geek political thought of Plato and Aristotle
- Roman political thought of Polybius and Cicero
- ModernPolitical Thought of Machiavelli, Hobbs, Locke and Rousseau and
- LiberalPolitical Thought of J.S Mill, and T.H.Green.

COURSE CONTENT:

Unit I: Greek Political Thought
Political Thought of Plato and Aristotle
Unit II: Roman Political Thought
Political Thought of Polybius and Cicero
Unit III: Modern Political Thought
Political Thought of Machiavelli, Hobbes, Locke and Rousseau
Unit IV: Liberal Political Thought
Political Thought of J.S Mill, and T.H.Green

References

1. Barker, Ernest, *Greek Political Theory*, BL Publishers, Bombay, 1980.
2. Bowle, John, *Western Political Thought*, Kegan Paul, London, 1970.
3. Dunning, W.A., *A History of Political Theories*, The McMillan Company, London, 1992.
4. Ebenstein, *Great Political Thinkers*, Harcourt College Publishers, 2001.
5. Sabine G.H., *A History of Political Theory*, Oxford Publications, New Delhi, 1973.

ABILITY ENHANCEMENT COURSE AEC 1B : LANGUAGE

BAE II.4A : HINDI

Credits 3 (2L+1T+0P) **Max. Marks: 100**
Contact Hours per week: 4 **C1+C2:50**
Exam duration: 2 Hrs **C 3:50**

Objectives:

- To enable the students to acquire basic skills in functional language.
- To develop independent reading skills and reading for appreciating literary works.
- To internalise grammar rules so as to facilitate fluency in speech and writing.
- To develop functional and creative skills in language.
- To develop values of liberalism and an insight into the cultural heritage of the region which remains embodied in the literary output of the region.

COURSE CONTENT:

Unit I : Functional Language
Prayojanmoolak Hindi: Prayog ke Chhetra
Prayojanmoolak Hindi: Rajbhasha Hindi-Samvaidhanik Pravdhan, Raajbhasha Adhiniyam Aadi**,** Sarkari Karyalayon mein Prayukt Hindi-Karyalayee Aalekhan, Tippan, Patrachar, Sanchhepan

Unit II : **Communication skills**
Varta (Conversation): Characteristics – Definition – Styles of conversation – Higher order skills-Telephonic conversation, Role Play, – Models, etc. – Exercises.
Bahas (Debate): Characteristics – Definition – Need of Debate – Technique to conduct Debates, etc. Exercise.

Unit III : Drama and Novel :
Hanoosh by Bhishm Sahani Published by Rajkamal Prakashan, Delhi
Karmbhoomi by Premchand, Swaraj Prakashan, Delhi

Unit IV : Modern Literature
Collection of Essays:

a) Baalkrisna Bhatt- Manusya Ke Jivan Ki Sarthakta
b) Mahaveer Prasad Diwedi- Sahitya Ki Mahatta
c) Sardar Purn Singh- Aacharan Ki Sabhyata
d) Hajari Prasad Diwedi- Kutaj
e) Harishankar Parsai- Thithurta Hua Gantantra
f) Nirmal Verma- Dharm Aur Dharmnirpechhata

References:

1. Prayojanmoolak Hindi- Madhav Sontakke, Rajkamal Prakashan Samooh, Delhi
2. Prayojanmoolak Hindi ki Nayee Bhoomika- Kailash Nath Panday, Rajkamal Prakashan Samooh, Delhi
3. Prayojanmoolak Hindi: Sidhant aur Prayog- Dangal Jhalte, Vani Prakashan, Delhi
4. Hindi Nibandh Sahitya ka Sanskritik Addhyan: Dr Baburam,Vani Prakashan, Delhi
5. Hindi Gadhya-Vinayas aur Vikas: Ramswaroop Chaturvedi, Lokbharti Prakashan, Delhi
6. Aadhunik Hindi Ka Gadhya Sahitya: Ramchandra Tivari, Lokbharti Prakashan, Delhi
7. Aadhunik Hindi Sahitya ka Itihas: Bacchan Singh, Lokbharti Prakashan, Delhi
8. Bhakti Aandolan aur Surdaska Kavya: Maneger Panday, Vani Prakashan, Delhi
9. Bhakti Ke Aayam: Dr P Jayraaman, Vani Prakashan, Delhi

10. Bhartiya Bhakti Sahitya: Dr Rajmal Bora, Vani Prakashan, Delhi
11. Bhaktikavya ka Samajdarshan: Dr Premshankar, Vani Prakashan, Delhi
12. Anuprayukt Rajbhasha: Manik Mrigesh, Vani Prakashan, Delhi
13. Prayojanmoolak Hindi- Madhav Sontakke, Rajkamal Prakashan Samooh, Delhi
14. Prayojanmoolak Hindi ki Nayee Bhoomika- Kailash Nath Panday, Rajkamal Prakashan Samooh, Delhi
15. Prayojanmoolak Hindi: Sidhant aur Prayog- Dangal Jhalte, Vani Prakashan, Delhi
16. Sarkari Karyalayon mein Hindi ka Prayog- GopiNath, Shrivastav, Rajkamal Prakashan Samooh, Delhi
17. Alankar Mimansh: Murlimanohar Prsad Singh, Swaraj Prakashan, Delhi
18. Saral Hindi Vyakaran: Swaraj Prakashan, Delhi
19. Upanyas aur Lokjeevan: Railph Fox, Vani Prakashan, Delhi
20. Upanyas ka Uadai: Aayan Waat, Hariyana Grantha Academy, Haryana

BAE II.4B : KANNADA

Credits 3 (2L+1T+0P) **Max. Marks: 100**
Contact Hours per week: 4 **C1+C2:50**
Exam duration: 2 Hrs **C 3:50**

Objectives*:*

- To enable the students to acquire basic skills in functional language.
- To develop independent reading skills and reading for appreciating literary works.
- To internalize grammar rules so as to facilitate fluency in speech and writing.
- To develop functional and creative skills in language.
- To develop values of liberalism and an insight into the cultural heritage of the region which remains embodied in the literary output of the region.

COURSE CONTENT:

Unit I: Descriptive Grammar

Samasa and Alankara

Unit II: Functional Language

a) News reporting: Characteristics – definition – language of news reporting–model of news report-patterns – role of media in news reporting – exercises.

b) Interview: Characteristics – definitions – preparation for interview – various types of interviews (business – employment – literary etc) – exercises.

Unit III: Medieval Poetry

i) Enna Devange Jagavella Hennu Noada - Akkamahadevi
ii) Kaayuttirdanirulu Hagalennade-Raghavanka
iii) Parahimseyam Madi Manavam Baldapane – Lakshmeesha

(Kaavya Sanchaya – 3- Mysore University, Mysore).

Unit IV: Collection of Essays

i) Prajle Mattu Parisara-U R Ananthamurthy
ii) Samakalina Prajne– G S Shivarudrappa
iii) Samaanaavakaasha – S L Bhairappa
iv) Namma Prachinara Jivana Moulyagalu- T V Venkatachalashastri

(Selected from Gadya Vihara Part III) Mysore University, Mysore

References:

1. Kannada Kaipidi, Prasaranga Publication, University of Mysore

2. Fundamentals of Journalism, Report Writing and Editing by R.Thomas Berner, MarquetteBooks LLC, Washington.
3. The Perfect Interview by Max Eggert, Random House, UK.

BAE II.4C : MALAYALAM

Credits 3 (2L+1T+0P) **Max. Marks: 100**
Contact Hours per week: 4 **C1+C2:50**
Exam duration: 2 Hrs **C 3:50**

Objectives*:*

- To enable the students to acquire basic skills in functional language.
- To develop independent reading skills and reading for appreciating literary works.
- To internalize grammar rules so as to facilitate fluency in speech and writing.
- To develop functional and creative skills in language.
- To develop values of liberalism and an insight into the cultural heritage of the region which remains embodied in the literary output of the region.

COURSE CONTENT:

Unit I. **Descriptive Grammar**
Samasa and Alamkara

Unit II : **Functional Language**

1. News reporting- Characteristics –definition – language of news reporting– model of news report- patterns – role of media in news reporting – exercises
2. Interview- Characteristics – definitions – preparation for interview – various types of Interviews (business – employment – literary etc) – exercises.

Unit III: Poetry - Medieval

VEENA POOVU by Kumaaran ashan, Published by Devi Book Stall, Kodungalloor

Unit IV: Collection of Essays
Lessons from "Bharatha Paryatanam By Kutti Krishna Maraar, Published by Maraar Sahitya Prakasha, Kozhikode
1. Yudhathinte parinaamam, 2. Amba, 3. Karnante arangettram, 4. Markandeyante chiri

References:
1. Bhashaa bhushanam and Kerala Paanineeyam, NBS, Kottayam
2. Fundamentals of Journalism, Report Writing and Editing by R.Thomas Berner, Marquette Books LLC, Washington.
3. The Perfect Interview by Max Eggert, Random House, UK.

BAE II.4D : TAMIL

Credits 3 (2L+1T+0P) **Max. Marks: 100**
Contact Hours per week: 4 **C1+C2:50**
Exam duration: 2 Hrs **C 3:50**

Objectives:

- To enable the students to acquire basic skills in functional language.
- To develop independent reading skills and reading for appreciating the literary works
- To internalize grammar rules so as to facilitate fluency in speech and writing
- To develop functional and creative skills in language.
- To develop value of liberalism and an insight into the cultural heritage of the region which remains embodied in the literary output of the region.

COURSE CONTENT:

Unit I: **Aspects of Style**

Styles of writing

Idioms, Phrases and Proverbs

Unit II: Functional Language:

News Reporting: Characteristics-Definition-language of news reporting-model of news reporting-patterns-role of media in news reporting –exercises.

Interview: Characteristics-definition-preparation for interview-various types of interviews (business-employment-literary etc.)-exercises

Unit III: Medieval Poetry

Periya Puranam Selection of poems

Naladiyar – Selection of poems

An Anthology of Tamil Poetry

Unit IV: Collection of Essays

Ariviyal Tamilzhakkam-S. V. Shanmugam (3 Essays), New Century Book House (P) Ltd, 41 – B SIDCO Industrial Estate Chennai 600 017, Tamil Nenjam-Dr. M. Varadharajan (3 Essays)

References:

1. Tamil Ningalum Thavarillamal Ezhuthalam, Dr. Porka
2. Fundamentals of journalism, Report Writing and editing by R. Thomas Berner, Maruette BooksLLC, Washington.
3. The perfect Interview by Max Eggert, Random House, UK.

BAE II.4E : TELUGU

Credits 3 (2L+1T+0P) **Max. Marks: 100**
Contact Hours per week: 4 **C1+C2:50**
Exam duration: 2 Hrs **C 3:50**

Objectives:

- To enable the students to acquire basic skills in functional language.
- To develop independent reading skills and reading for appreciating the literary works
- To internalize grammar rules so as to facilitate fluency in speech and writing
- To develop functional and creative skills in language.
- To develop value of liberalism and an insight into the cultural heritage of the region which remains embodied in the literary output of the region.

COURSE CONTENT:

Unit I: Functional language (Styles and Registers)

1. Essay Writing: Characteristics – Definition – Format of Essays – Types of Essays (Literary, Scientific, etc.) – Models – Exercises.
2. Translation: Characteristics – Definition – Need of Translation – Translation Models – Exercises (From English to Regional Languages).

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Unit II : **Communication skills (Effective speaking and effective writing) in language**

1. Conversation: Characteristics – Definition – Styles of conversation – Higher order skills- Telephonic conversation, Role Play, – Models, etc. – Exercises.
2. Debate: Characteristics – Definition – Need of Debate – Technique to conduct Debates, and other Exercise.

Unit III: Ancient Poetry and medieval poetry

1. Damayanthee Swayamvaram by Nannaya (First 18 Poems)
2. Sathyabhama Santhwanam by Nandi Timmana (Poems 82 to 104)
   (From Telugu Sahithya Sravanthi, by Prasaranga, University of Mysore, Mysore).

Unit IV : Genre of literature (Prose: Literary Work)

1. Andrula Sanghika Acharamulu by Khandavalli Lakshmi Ranjanam.
2. Telugu Samethalu by Nayani Krishna Kumari
   (From Telugu Sahithya Sravanthi, by Prasaranga, University of Mysore, Mysore).

References:

1. A Hand book of writing activities, Prasaranga, University of Bangalore.
2. About Translation by Peter Newmark, Multi lingual Motters, Clavedon, UK,
3. The art of Translation (A Symposium), Ministry of Scientific Research and Cultural Affairs, Govt.of India.
4. Effective Group Discussion – Theory and Practice be Gloria J.Galanes, McGraw Hill
5. Anuvada Samsyalu by Rachamallu Ramachandra Reddy, Published by Visalandhra Books, Hyderabad
6. Aspects of Translation, Prof K V L Narasimha Rao, CIIL Publication, Mysore

Ability Enhancement Course AEC 2B : English

BAE II.5 : LANGUAGE PROFICIENCY IN ENGLISH-1I

Credits 3 (2L+1T+0P) **Max. Marks: 100**
Contact Hours per week: 4 **C1+C2:50**
Exam duration: 2 Hrs **C 3:50**

Objectives :

Students develop proficiency in English which equips them to:

- understand the demands of audience, subject, situation and purpose and the use of language for effective communication.
- analyse language in context to gain an understanding of grammar, vocabulary, spelling, punctuation and speech.
- examine authentic literary and non-literary texts and develop insight and appreciation.

- gain an understanding of study and reference skills.
- plan, draft, edit and present a piece of writing.

COURSE CONTENT:

Unit I: **Descriptive Grammar**
Function of Auxiliaries; Modals; Question form
Clauses: Noun Clause; Reported Speech and Change of Voice.

Unit II: Development of Language Competence
To be based on the use of multiple texts which address issues of multiculturalism, gender, racism and texts which relate with current issues and contemporary trends. Short stories, comic strips, cartoons and animations (both print and non-print media) to be used. Speeches of famous persons, diaries, travelogues can also be used.

Unit III: Writing for Functional Purposes
Letter-writing (Professional / Personal)
Creative Skills in Writing: Writing dialogues, poems and essays

Unit IV: Basic Phonetics
Sounds of English language, intonation and transcription using IPA.

References:

1. Chan. et al. (1997) Professional Writing Skills, San Anselma, CA
2. Fiderer, A. (1994) Teaching Writing: A Workshop Approach. Scholastic.
3. Block, C.C. (1997). Teaching the Language Arts, 2nd Ed. Allyn and Bacon
4. Mckay. et al. (1995). The Communication Skills Book, 2nd Ed. New Harbinger Publications.
5. Merrriam, E. (1964). It Doesn't Always Have to Rhyme. Atheneum.
6. Hyland, Ken (2004) Second Language Writing. University of Michigan Press.
7. Graves,D (1992). Explore Poetry: The reading /writing teacher's companion. Heinemann
8. Stone Douglas (1999). Difficult conversations: How to discuss what Matters Most, New York.: Penguin Books.
9. Gabor Don (2001). How to start a Conversation and Make Friends, New York: Fireside.

PROFESSIONAL EDUCATION COURSES

BAE II.6 : CONTEMPORARY INDIAN EDUCATION

Credits: 4 (3L+ 1T +0P) **Marks: 100**
Contact hrs per week: 5 **C1 + C2: 50**
Exam Duration: 2 hrs **C3: 50**

Objectives:
The course enables the student teachers to:
- Understand different perspectives of Education.
- Analyse the concept of Education and its related terms

- Analyse the Aims of Education and their determinants
- Reflect on the educational ideas and systems of various thinkers and develop the ability to theorize educational practices;
- Collect evidences for the influence of socio-cultural aspects on Education
- Analyse the role of Education on society by gathering various evidences and illustrations
- Understand and appreciate the need of autonomy to teacher and learners
- See the relationship between autonomy, accountability, and commitment
- Arrive at a list of qualities of a committed teacher through discussions.

COURSE CONTENT:

Unit I: Education: Concept, Nature, and Purpose

Education as concept and its distinct nature; Classical, Liberalists and Progressivists view on Education; Analytical concept of education - education as a normative concept; Education as a family of Processes; Education as worthwhile activity; Cognitive and normative dimensions of education; Education and Educated person;

Education as System; Modes of education- formal, informal, non-formal;

Education and its related concepts- Training, Instruction and teaching

Education: Purpose(s) and Determinants - Determinants of Purpose-individual, Community, Religion, State and Market; Brief historical inquiry into purposes and determinants of education (from ancient India to contemporary India); social context of purposes of education

Education as a Discipline and Interdisciplinary in nature

Aims of Education from ancient to contemporary Indian society

Education as value development

Determinants of Aims of Education in emerging India

Unit II: Education and Socio-cultural context

Education as an instrument of social change; Influence of education on society and family; Socio-cultural influences on the aims of education; Emerging trends in societies and their influence on education

Education and Development

Globalization and Internationalization of education

Unit III: Educational thoughts and practices

Critical reflection on the educational thoughts of Indian and Western thinkers and on their relevance to the present education system

Indian: Mahatma Gandhi, Rabindranath Tagore, Aurobindo, Swami Vivekananada, Jiddu Krishnamurthy, Gijju Bhai Badheka; B R Ambedkar; Vinova Bhave

Western: Plato, Rousseau, John Dewey, Froebel, Montessori, Ivan Iliach, Paulo Frieri

Unit IV: Autonomy of Teacher and Learner

Autonomy: Meaning and extent

Teacher autonomy: Meaning, extent and nature; Teacher as autonomous professional; Areas of teacher autonomy: Their limit-situations - Curriculum making; Learning resources and material selection and use; Pedagogical practices; Assessment modalities; Limit-situations: Structures- Structured curriculum, and examination system; Time-tables;

Learner Autonomy: Meaning, extent and nature; Learning as an autonomous act; Meaning making and learners' autonomy-opportunities and constraints

Autonomy and Accountability: Teacher Accountability; Teacher commitment

Sessional Activities:

- Presentations on Educational thoughts of Various thinkers
- Preparation of an Album or posters on different thoughts of great thinkers

- Analysis of aims of education from ancient Vedic times to modern times
- Collection of examples/evidences to show the influence of Education on social change and the socio-cultural influences on Educational aims
- Comparative study of National curriculum frameworks of NCERT on aims of education
- Readings on Position paper on " Aims of Education"-NCF 2005
- Comparative study of Aims of Education of few countries
- Collection of case studies that exemplifies teacher accountability and commitment

References:

1. Alfred North Whitehead (1967), 'The Aims of Education and Other Essays', The McMilan Company, New York. .
2. Debra Hayes, Martin Hills, Pam Christie & Bob Lingard (2007) Teachers & Schooling: Making a Difference, Allen and Unwin, Australia.
3. Dewey, John (1938) Experience and Education Kappa Delta Pi, Indianapolis, USA
4. Diane Tellman (2000), Living Values: An Educational Program, Sterling Publishing Private Limited, USA.
5. Freiri, Paulo (1968). Pedagogy of the Oppressed, Sea burry Press, New York, USA
6. Hirst, Paul (1970). The Logic of Education, Taylor & Francis, London
7. JJ Rousseau, (1956) Emile
8. John S Brubacher, (1969) Modern Philosophies of Education. Tata McGraw Hill Pub., Co.,Pvt., Ltd, New Delhi.
9. Krishna Murthy, J. (1947) On Education, Orient Longman, New Delhi.
10. Mani, R.S. (1964). Educational Ideas and Ideals of Gandhi and Tagore, New Book Society, New Delhi.
11. Manoj Das (1999). Sri Aurobindo on Education, National Council for Teacher Education, New Delhi.
12. Margaret (1999). The Open Classroom: A Journey through Education, Orient Longman, New Delhi.
13. Mathur S.S. (1988). A Sociological Approach to Indian Education, Vinod Prakashan, Agra.
14. NCERT (2013). Basics in Education, National Council of Educational Research and Training, New Delhi.
15. NCERT, (2005). National Curriculum Framework-2005. National Council of Educational Research and Training, New Delhi.
16. O'Connor,J (1958) Philosophy of Education, pub by Duke University Press on behalf of philosophical review.
17. Peters, R.S. (1967), The Concept of Education, Routledge, United Kingdom.
18. Peters, RS (1968). Ethics and education.(5th edn), George Allen & Unwin Ltd, London
19. Prema Clarke (2001). Teaching & Learning: The Culture of pedagogy, Sage Publication, New Delhi.
20. Scheffler, Israel (1966).Philosophy and Education: Modern Readings, Allyn and Bacon, Boston, US
21. Stella Van Petten Henderson (1960) Introduction to Philosophy, The University of Chicago press, Chicago.
22. Steven H. Cahn (1970). The Philosophical Foundation of Education, Harper & Row Publishers, New York.

BAE II.7 : YOGA EDUCATION, SELF UNDERSTANDING AND DEVELOPMENT

Credits: 2 (1L+ 0T +1P) **Marks: 100**
Contact hrs per week: 3 **C1 + C2: 50**
Exam Duration: 2 hrs **C3: 50**

Objectives

The student teacher will be able to:

- Understand the meaning and importance of self-concept and self-esteem.
- Be aware of different factors related to self-concepts and self-esteem. Record a brief history of development of yoga through the ages. Discuss how yoga and yoga practices are important for healthy living.
- Explain some important principles of yoga.
- Explain the different limbs of *Astañga* yoga.
- State the different types of yoga.
- Derive how Hatha yoga and *Astañga* yoga are complementary to each other.
- Enable the student to have good health.
- Practice mental hygiene.
- Possess emotional stability.
- Integrate moral values.
- Attain higher level of consciousness.
- Demonstrate some important *asanas* and *pranayama*.

COURSE CONTENT

Unit I : Introduction to Yoga and Yogic Practices

Yoga: meaning and initiation, What is Yoga? Misconnects of Yoga, History of development of yoga, The streams of Yoga: Astanga yoga Raja yoga, Yogic practices for healthy living

Unit II Introduction to Yogic Texts

Historicity of yoga as a discipline, Classification of yoga and yogic texts, Hatha yogic practices, Meditational processes

Unit III: Yoga and Health

Need of yoga for positive health, Role of mind in positive health as per ancient yogic literature, Concept of health, healing and disease: yogic perspectives, Potential cause of ill health, Yogic principles of healthy living

Unit IV: Personality Development and Stress Management through Yoga

Yogic Practices for Personality Development : Surya Namaskar, Asanas : Tadasana, Simhasana, Kukkutasana, Akarna Dhanurasana, Matsyasana, Prnayama, Anuloma-Viloma Pranayama, Bhastrika Pranayama, Banda, Uddiyana Bandha, Dhyana (Meditation) , Meditation, What is Stress, Yoga as a Way of Life for Stress Management: Ahara, Vihara, Achara, Vichara, Vyavahara, Yogic Practices for Stress Management ; Asanas, Hastottanasana, Padahastasana, Trikonasana, Shashankasana, Ushtrasana, Ardha-matsyendrasana , Bhujangasana, Makarasana, Sarvangasana, Matsyasana, Shavasana; Pranayama, Anuloma-Viloma Pranayama, Bhastrika Pranayama, Bhramari Pranayama,

Sheetali Pranayama; Meditation, Yoga for Healthy Living, Shirshasana, Bakasana, Hamsasana, Mayurasana

PRACTICALS

Exam Duration: 3 hrs **C_3 : 50 marks**

Practicum

- General guidelines for performance of the practice of yoga for the beginners

1. Guidelines for the practice of *āsanas*
2. Guidelines for the practice of *prānāyāma*
3. Guidelines for the practice of *meditation*

- Select yoga practices for persons of average health for practical yoga sessions

5. Supine position
6. Prone position
7. Sitting position
8. Standing position
9. Mudras
10. Prānāyāmas

* In addition, school and community based activities may be organised.

Evaluation Strategies

The evaluation will be done through practicals/ assessment of ability to develop and design softwares for selected contents.

References:

1. Adair, J. and Allen, M. (1999). *Time Management and Personal Development.* London: Hawksmere.
2. NCERT (2015). Yoga: A Healthy Way of Living Upper Primary Stage, New Delhi (Also available in Hindi)
3. NCERT (2015). Yoga: A Healthy Way of Living Secondary Stage, New Delhi. (Also available in Hindi)
4. Rohrer, J. (2002). *ABC of Awareness.* Oberurnen: UTD Media.
5. Simanowitz, V. and Pearce, P. (2003). *Personality Development.* Beckshire: Open University Press.
6. Stevens, N. (2008). *Learning to Coach.* United Kingdom: How to books.

THIRD SEMESTER

Core Course 1 C :English Literature

BAE III.1 : RESTORATION, NEO-CLASSICISM, ROMANTICISM AND THE VICTORIANISM

Credits: 4 (3L+1T+0P) **Max. Marks: 100**
Contact Hrs per week: 5 **C 1+C 2: 50**
Exam Duration: 2 hrs **C3: 50**

Objectives:

- To introduce student teachers to Restoration, the age of Prose and Reason,
- To enlighten student teachers about the basic concepts of Romanticism which may perplex the learner with the sheer abundance of definitions and lack of common denominators. It will simultaneously seek to introduce the learners to the major poets of the English Romantic movement.
- To introduce student teachers to the influential novelists and masterpieces of the Victorian period.
- To help the student teachers acquaint themselves with the cardinal essayists, their styles, themes and techniques.
- To offer insights to the learner about the period of the transition from Romanticism to the Victorianism.
- To make the student teachers understand the central themes, techniques and masterpieces of the Restoration theatre.

COURSE CONTENT:

Unit I: Poetry

1. John Dryden : Mac Flecknoe
2. James Thomson : “Spring” [from The Seasons]
3. Thomas Gray : “Ode on the Death of a Favourite Cat”
4. Robert Burns : “The Cotter’s Saturday Night

Unit II : **Poetry**

William Blake : The Chimney Sweeper
William Wordsworth : 'She dwelt among the untrodden ways' , Tintern Abbey
Samuel Taylor Coleridge : Rime of the Ancient Mariner, Kubla Khan
John Keats: Ode to a Nightingale
Percy Bysshe Shelley : Ode to the Westwind
Lord Byron : She Walks in Beauty
Robert Browning : My Last Duchess
Tennyson : Ulysses
Matthew Arnold : “Dover Beach'
Gerald Hopkins : “The Pied Beauty'

Unit III. **Drama**

Oliver Goldsmith : She Stoops to Conquer
Richard Brinsely Sheriden : School for Scandal
John Galsworthy : Strife

Unit IV. Prose and Fiction
Joseph Addison: "Sir Roger at the Assizes"
Thomas Hardy : Tess of the D'Urbervilles
Charles Dickens : A Tale of Two Cities
Sherlock Holmes : The Hound of the Baskervilles
Jane Austen : Pride and Prejudice
Thomas De Quincey : Confessions of an English Opium Eater
Charles Lamb : "Modern Gallantry" & "Poor Relations"
Wordsworth: Preface to Lyrical Ballads
P.B.Shelley: Defence of Poetry
Coleridge: Ch. 13 & 14 Biographia Literaria

References:

1. Cambridge Companion to British Romanticism
2. Pelican Guide to English Literature – Dickens to Hardy to Lyrical Ballads
3. Norton's Anthology, Volume.2 1-7, 139
4. Mathew Arnold- Culture and Anarchy
5. Dickens- Novel ' Changing Face of City'
6. Meenakshi Mukherjee - Jane Austen
7. William Congrev- Excerpts from London Gazette
8. Brown, John Russel, and Harris, Bernard(ed.)- Restoration Theatre (London, 1965)
9. Richetti, John, The Cambridge Companion to Eighteenth Century Novel (Cambridge, 1996)
10. Cambridge Companion to English Poetry- Donne to Marvel
11. Restoration Theatre - ed. Brown, John Russel
12. Background Prose Reading - papers 6,7 & 8: Worldview, an Imprint of Book Land Publishing co.

Core Course 2 C : History

BAE III.2 : HISTORY OF MODERN INDIA

Credits 4 (3L+1T+0P) **Max. Marks: 100**
Contact Hours per week: 5 **C1+ C2: 50**
Exam duration: 2 Hrs **C3: 50**

Objectives:
After completion of the course, the student teachers will be able to :
- Understand the nature and character of 18th Century India
- Expansion of British power during colonial period,
- Government, administration and social reforms in Colonial India
- Social base of Indian National Movement

COURSE CONTENT:

Unit I: 18th Century India
Decline of the Mughal Empire-India in the 18th Century- Advent of British and the French - Carnatic Wars

Unit II: Expansion of British power
Expansion of British power in India-Subjugation of Bengal-Plassey, Buxar and Anglo-Maratha Wars-Ranjit Singh and Anglo-Sikh Wars

Unit III: Government, administration and social reforms in colonial India

Structure of the government- Regulating Act of 1773-Pitt's India Act of 1784-Land revenue Policy-Zamindari, Ryotwari and Mahalwari systems-Development of transport and communication and introduction of railways, post and telegraph-print technology-Drain of wealth-Utilitarian and Orientalist influence on administrators: Administrative and social policies-Administrative reforms of Cornwallis-Creation of the civil service-Rule of law and the development of new judicial system- Army reforms of William Bentinck-Introduction of English education-Role of Macaulay-Social reforms-Rammohan Roy and the abolition of Sati, Iswarchandra Vidya Sagar-

Unit IV: Social base of national movement

The Rebellion of 1857-causes, nature, results and social composition-Early nationalists-movement of the Moderates-Rise of extremism-The Gandhian Era-National struggle and the Left-Revolutionary nationalists-Workers and peasants-Radical forces-Tribals, Dalits and women movements

(A) Nationalism in modern India (1885-1905)

Factors responsible for the growth of nationalism-Drain of wealth-Socio-religious reform movements and background-Era of moderates- modern political associations-Establishment of Indian National Congress-Moderates and Radicals

(B) Indian National Movement (1905-1920)

The formation of Muslim League-Curzon and the Partition of Bengal-The Swadeshi movement in Bengal-Growth of extreme nationalism–Revolutionary violence-constructive and self-help programmes-Boycott and mass movements-Extremists and their techniques - Militant nationalism-The Home Rule Movement

(c) Indian National Movement (1920-1947)

National movement during the World Wars-Lucknow session of Congress-League Pact-Home Rule Movement-Rowlatt Satyagraha and Jallian Wala Bagh tragedy-Non-Cooperation Movement-Civil Disobedience Movement- Simon Commission-Round Table Conferences-National Movement after 1935-Indian National Army-Growth of Communalism-Hindu Mahasabha- Muslim League and two nation theory-Partition and independence

Maps for Study

I. Centres of Early Revolts
II. Administrative Divisions of British India
III. Congress Sessions 1885 – 1947
IV. Three Presidencies of British Empire
V. Sikh State under Ranjit Singh
VI. British Empire in 1857

References:

1. Arthur, D. Innes, *History of British in India*, New Delhi, 1998
2. B R Tamlinson, *The Economy of Modern India***,** Cambridge University Press
3. Bayly, C A., *Rulers Townsmen and Bazaars*, Oxford India, Reprint 1998
4. Bipan Chandra et.al. *Struggle for India's Independence***,** New Delhi, 1989
5. Bipan Chandra, *Nationalism and Colonialism in India***,** Oriental Longman
6. -------, *Essays on Colonialism***,** Oriental Longman, Hyderabad
7. -------, *Nationalism and Colonialism in India***,** Orient Longman
8. -------, *The Rise and Growth of Economic Nationalism in India*, Bombay, 1998 *India*, New Delhi, 1975
9. Chatterjee, Partha, *Nationalist Thought and the Colonial World: A Derivative Discourse?* Delhi, 1986

10. Chaudhuri, S.B., *Civil Disturbances During the British Rule in India, 1765-1857*, Calcutta, 1955
11. Desai, A. R., *Social Background of Indian Nationalism***,** Popular Prakasan, New Delhi
12. *Economic History of India, Vol. II (1757-1970),*Orient Longman
13. Eugene F. Irshick, *Politics and Social Conflict in South India*, Berkeley, 1969
14. George D. Bearce, *British Attitude Towards India (1784 – 1858)*, Oxford
15. Gopal S., British Policy in India (1858-1905), Orient Longman, 1975
16. Grover, B.L., *A New Look at the Modern Indian History*, New Delhi, 2000
17. John Malcolm, *Political History of British India*, Discovery Publishing House
18. Majumdar, R C., *British Paramountcy and the Indian Renaissance, Part I*
19. -------, *Struggle For Freedom***,** Bharatiya Vidya Bhavan

Core Course 3 C : Geography

BAE III.3A : OCEANOGRAPHY

Credits 4 (3L+0T+1P) **Max. Marks: 100**
Contact Hours per week: 5 **C_1+ C_2: 50**
Exam duration: 2 Hrs **C_3:50**

Objectives:
This paper on Oceanography The component of oceanography similarly deals with the coastal processes and describes the vast and diversified resources the oceans hold.

COURSE CONTENTS:

Unit I: Oceanography
Nature and Scope of Oceanography. Distribution of Land and Sea on Earth Surface, Characteristics of their arrangements. Water Bodies and their nomenclature. Geologic differences between continents and ocean Basins.

Unit II: Physiography of the Ocean floor
Bathymetric Provinces: 1) Continental Margins: shelf, Slope, Rise and Submarine Canyons 2) **Deep Ocean Basins:** Abyssal Plain, Abyssal Hills, Sea Mounts, Guyots and Deep Sea Trenches. 3) Mid-oceanic Ridges. Bottom Relief of the Atlantic, the Pacific and the Indian Oceans.

Unit III: The Properties of Ocean water
Composition of Ocean Water; Temperature of the Ocean: Factors affecting the distribution of the temperature, Horizontal and vertical Distribution of the Ocean Temperature. Salinity: Factors affecting the distribution of the Salinity, Horizontal and vertical Distribution of the Ocean Salinity. Density: Factors affecting the distribution of the Density, Horizontal and vertical Distribution of the Ocean Density.

Unit IV: Circulation of Oceanic Waters
Waves: Their Structure, Types of Waves. Tides: Origin and Types of the Tides, Effect of Tides. Ocean Currents: Origin and Types, Currents of the Atlantic, Pacific and Indian oceans.

Marine deposits: Sources and Types of Marine Deposits. Coral Reefs: Condition of Growth, Types of Coral Reefs, Structure of Coral Reefs.

References:

1. Anikouchine W . A . and Sternberg R.W: The World Oceans-An Introduction to Oceanography, Englewood Cliffs,N.J. 1973.
2. Grald,S.: General Oceanography - An Introduction, John Wiley & Sons, New York, 1980.
3. Garrison, T. Oceanography. Wadsworth.com. USA 1998.
4. King, C.A.M.: Beaches and Coasts, E. Arnold, London, 1972.
5. King, C.A.M: Oceanography for Geographers E. Arnold, London, 1975. Curriculum Development Committee in Geography45
6. Sharma,R.C. Vatal M. Oceanography for Geographers, Chetnya Publishing House, Allahabad, 1970
7. Shepard, F.P: Submarine Geology, Harper & Sons, New York, 1948.
8. Thurman, H.B.: Introductory Oceanography, Charles Webber E.Merril Publishing Co., 1984.
10. Weisberg,J.and Howard: Introductory Oceanography, McGraw-Hill Book Co., New York, 1976.

PRACTICALS

Exam Duration: 3 hrs **C_3: 50**

COURSE CONTENT:

1. **Map Projections:** Definition, Classification and Importance
2. **Conical Projections**: Classification of Conical Projection, Simple Conical Projection with One Standard Parallel, Conical Projection with two Standard parallels, Bonne's Conical Projection, Polyconic Projection.
3. **Zenithal Projections**: Stereographical Polar Zenithal Projection, Polar Zenithal Gnomonic Projection, Orthographic Polar Zenithal Projection and Polar Zenithal Equal Area Projections and Polar Zenithal Equidistance Projection.
4. **Cylindrical Projections**: Simple cylindrical Projection, Cylindrical equal area Projection, Mercator's Projection.
5. **Conventional Projections**: Mollweide Projection, Sinusoidal Projection. Criteria for Choice of Projection.

References:

1. Singh, R.L., Elements of Practical Geography, Kalyani Publishers, New Delhi, 1979.
2. Gopal Singh, Map work and Practical Geography, III Ed., Vikas Publishing House, New Delhi.
3. Gupta, K and Tyagi V C, Working with Maps, Survey of India, Department of Science and Technology, Government of India, Dehra Dun 1992.
4. John and Keats, Cartographic Design and Production, II Edition, 1989, John Wiley, New York.
5. Mishra R P, Fundamentals of Cartography, 1969, Prasaranga, University of Mysore, Mysore.
6. Monkhouse F.J. and Wilkinson, H.R., Maps and Diagrams, Mathuen and Co. Ltd., London, 1952.
7. Phyllis Dink, Map work X (Ed) Atma Ram and Sons, Delhi, 1967.
8. Robinson, H. Elements of Cartography, John Wiley, London, 1963.

9. D R Khullar, Essentials of practical geography, New Academic Publishing Co., Mai Hiran Gate, Jalandhar, 2003.

Core Course 3 C : Political Science

BAE III.3B : INDIAN POLITICAL THOUGHT

Credits: 4 (3L+1T+0P) **Max. Marks: 100**
Contact Hrs per week: 5 **C 1+C 2: 50**
Exam Duration: 2 hrs **C3: 50**

Objectives: After completing the course the student teachers will be able to understand and comprehend:

- the significance of Ancient Indian Political Thought
- the significance of Modern Indian Political Thought
- the contributions of various Social Reformers for the Indian Political Thought of the modern period and
- the significance of Socialism in India.

COURSE CONTENT

Unit I Ancient Indian Political Thought

Sources, Characteristics of ancient Indian Political thought, Manu on Dharma and Chaturvarna, Kautilya on Saptanga and Mandala Theory

Unit II Modern Indian Political Thought

Rajaram Mohan Roy, G.K Gokhale, B.G. Tilak, Syed Ahmad Khan

Unit III Social Reformers

Mahatma Jothiba Phule-his views on depressed classes and women, B.R. Ambdekar-his views on caste and social justice, Mahatma Gandhi-his ideas on Satyagraha, Gram swaraj and Social Justice.

Unit IV Socialism in India

Views of Jawaharlal Nehru, Ram Manohar Lohia, Jaya Prakash Narayan

References

1. Altekar, A.S., *Ancient Indian Political Thought*, Banarsidas, Allahabad, 1978.
2. Grover, Virinder, *Modern Indian Thinkers*, Deep and Deep New Delhi, 1990.
3. Jayaswal, K.P., *Hindu Polity*, Bangalore Printing Press, Bangalore, 1978.
4. Saletore, B.A., *Ancient Indian Political Thought and Institution*, Orient Longman, Bombay, 1963.
5. Varma, Viswanath, Prasad, *Modern Indian Political Thought*, Lakshminarayan Agarwal Education Publishers, Agra, 1961.

Skill Enhancement Course : SEC 1 English Literature

BAE III.4A : FILM STUDIES

Credits: 3 (2L+1T+0P) **Max. Marks: 100**
Contact Hours per week: 4 **C1+C2: 50**
Exam duration: 2 Hrs. **C3: 50**

Objectives:

- To give the students basic knowledge in the history, art and culture of motion picture.
- To introduce to them the key concepts in film studies.
- To help them analyze and appreciate films.
- To enable them pursue higher studies and careers in film
- On completion of the course, the students should be able to
- Discover the language of cinema
- Explain the key concepts in film studies.
- Analyse films as texts.
- Write critically about films

COURSE CONTENT:

Unit I : Understanding film.

What is film – its hybrid nature – the language of cinema – authorship - a brief history – film movements– Montage theory and Soviet cinema of the 20s – German expressionism and experiments with mise-en-scene – French poetic realism – classical Hollywood cinema and genre – Italian neo-realism – French New wave - contemporary international trends

Unit II : Indian Cinema.

Phalke and the desi enterprise – Indian cinema 30s to the 60s – The golden 50s – Indian art cinema and the Indian New wave –Introduction to the basic terminology of filmmaking Mise en scene, long takes deep focus Shots (close up, medium shot, long shot) Editing: chronological editing, cross cutting, montage, continuity editing, continuity cuts, jump cuts , match cuts, 30 degree rule, 180 degree rule. Sound in the movies, colour in the movies. The production, distribution and reception of films; censorship

Unit III: Introduction to film genres

The Major genres: Narrative, avant-garde, documentary

Other genres: Thriller, melodrama, musical, horror, western, fantasy animation film noir expressionist historical, mythological, road movies; Literature and Film: Literary language and Film language- adaptation and notions of fidelity- Narrative structure and strategies in film and fiction - time, space, character and setting - dialogue – music – sound effects.

Introduction to major movements and theories: The silent era; classic Hollywood cinema, Neo-Realism, French New wave, Indian cinema Introduction to the film theories of Sergei Eisenstein, Andre Bazin , auteur theory, Christian Metz and Laura Mulvey

Unit IV: Film analysis

Andre Bazin: The Evolution of the Language of Cinema (‘What is Cinema’)

Satyajit Ray: What is Wrong with Indian Films (from ‘Our Films Their Films’)

Ronald Abramson “Structure and Meaning in Cinema in Movies and Methods Ed. Bill Nichols

C.S.Venkitsweran, Swayamvaram: Classic Prophecies in Film and Philosophy ed. K Gopinathan

Films for close viewing: Rashomon, Citizen Cain, Pather Panjali, Bicylcle Thieves

Battleship Potemkin – Silent Cinema, Montage, Neo Realism, The Godfather : Hollywood Classic, Charulata : Indian Classic, Rashomon : Asian Classic. Japanese Cinema

References:

1. Villarejo, Amy. Film Studies: the Basics. Routledge, Indian Reprint, 2009.
2. Hayward, Susan. Key Concepts in Cinema Studies. London: Routledge, 1997.
3. Bywater, Tim and Thomas Sobchack. Introduction to Film Criticism. Pearson India, 2009.
4. Corrigan, Timothy, J. A Short Guide to Writing about Film. Pearson India, 2009.
5. Kupsc, Jarek. The History of Cinema for Beginners. Chennai: Orient Blackswan, 2006.
6. Dix, Andrew. Beginning Film Studies. New Delhi: Viva Books, 2010.
7. Stam, Robert and Alessandra Raengo Literature and Film: A Guide to Theory and Adaptation Oxford: Blackwell, 2003
8. Amy Villarejo. Film Studies : The Basics London & New York Routledge. 2007
9. Warren Buckland Teach Yourself Film studies , London , Hadden
10. Virginia Wright Wexman A History of Film Delhi , Pearson
11. Susan Heyward Key concepts in Cinema Studies London Routledge
12. J Dudley Andrew The Major Film Theories : An Introduction New Delhi Oxford
13. Michael Silverman (eds) "Elements of Literature" The Elements of Film New Delhi, OUP Pages 451-1491.
14. Leo Braudy & Marshall Cohen Eds. Film Theory and Criticism Oxford OUP
15. Geoffry Nowell Smith. The Oxford History of World Cinema Oxford OUP 80 Page 81 of 92
16. Satyjit Ray Our Films Their Films Hyderabad Orient Longman
17. J Dudley Andrew Concepts in Film theory Jarek Kupsc The History of Cinema for Beginners Hyderabad , Orient Longman
18. Victor Perkins Film as Film: Understanding and Judging Movies. Harmondsworth, Penguin
19. Bill Nicols ed. Movies and Methods
20. Rudolf Arnheim Film as Art London Faber
21. Andre Bazin What is Cinema Berkeley U of California P 10. John Caughie (ed) Theories of Authorship London BFI 11. John Corner The Art of Record: A Critical Introduction to Documentary, Manchester UP
22. David Bordwell The Cinema of Eisenstein London Routledge
23. Ashish Rajadyaksha & Paul Willeman Encyclopedia of Indian Cinema Oxford & New Delhi OUP
24. John Hill & Pamela Church Gilson (eds) The Oxford Guide to Film Studies OUP
25. David Overly (ed) Springtime in Italy: A Reader on Neorealism London, Talisman
26. James Monaco The New Wave NY OUP
27 Keiko McDonald Cinema East: A Critical Study of Major Japanese Films, London. Associated University Presses
28. Chidananda Das Gupta The Cinema of Satyajit Ray New Delhi Vikas

Suggested viewing list:

Michael Radford's Il Postino
Robert Wiene's The Cabinet of Dr. Caligari
Sergei Eisenstein's Battleship Potemkin
John Ford's Stagecoach
Alfred Hitchcock's Psycho
Mehboob's Mother India
Abbas Kiarostami Ten

Skill EnhancementCourse SEC 1: History

BAE III.4B : UNDERSTANDING HERITAGE

Credits: 3 (2L+1T+0P) **Max. Marks: 100**
Contact Hours per week: 4 **C1+C2: 50**
Exam duration: 2 Hrs. **C3: 50**

Objectives:
Students will be able to understand the different facets of heritage and their significance. It highlights the legal and institutional frameworks for heritage protection in India as also the challenges facing it. The implications of the rapidly changing interface between heritage and history will also be examined. The course will be strongly project-based and will require visits to sites and monuments. Atleast two Projects will be based on visits to Museums/Heritage Sites.

COURSE CONTENT:

Unit I : Defining Heritage
Meaning of 'antiquity', 'archaeological site', 'tangible heritage', 'intangible heritage' and 'art treasure'

Unit II: Evolution of Heritage Legislation and the Institutional Framework:
ConventionsandActs—national and international Heritage-related government departments, museums, regulatory bodies etc. Conservation Initiatives

Unit III: Challenges facing Tangible and Intangible Heritage
Development, antiquity smuggling, conflict (to be examined through specific case studies)

Unit IV: Heritage and Travel:
Viewing Heritage Sites The relationship between cultural heritage, landscape and travel recent trends

References:

1. David Lowenthal, Possessed By The Past: The Heritage Crusade and The Spoils of History, Cambridge,2010
2. Layton,R.P. Stoneand J.Thomas. Destruction and Conservation of Cultural Property. London: Rutledge, 2001
3. Lahiri,N. Marshaling the Past-Ancient India and its Modern
4. Histories.Ranikhet: Permanent Black.2012, Chapters 4 and 5.
5. S.S.Biswas, Protecting the Cultural Heritage (National Legislations and International Conventions). New Delhi: INTACH,1999.
6. Agrawal,O.P., Essentials of Conservation and Museology, Delhi, 2006
7. Chainani,S.2007. Heritage and Environment. Mumbai: Urban Design Research Institute.

Skill Enhancement Course : SEC1 Geography

BAE III.4C : REPRESENTATION OF STATISTICAL DATA

Credits: 3 (2L+0T+1P) **Max. Marks: 100**
Contact Hours per week: 4 **C1+C2: 50**
Exam duration: 2 Hrs **C3: 50**

Objectives:
The objectives of this course are to acquaint the students with the methods and techniques of representation of the statistical data. Application of these methods and techniques in geography in order to understand quantity and spatial distribution pattern.

COURSE CONTENT:

Unit I: Diagrams and Diagrammatic Maps
Methods of Drawing Diagrams: Bar or Pillar or Column, Block, Block Pilling Method, Wheel Diagrams, Pictorial Diagrams, Star Diagrams. Graphical Representation.

Unit II: Climograms:
Climographs, Hythergraphs, Ergographs, Band Graphs, Compound Pyramids, Superimposed Pyramids, Cartograms

Unit III: Distribution Maps
General Requirements for the Construction of Distribution Maps. Methods of Drawing Distribution Maps: Color or Tint Method, Symbol or Chroroschematic Methods, Diagrammatic Methods.

Unit IV: Population Maps
Some Specific Problems and Techniques for Population Mapping. Stock Maps, Crop Maps, Climatic Maps, Industrial Maps, Mineral Maps, Advantages and Limitations of Distribution Maps.

References:

1. Gopal Singh, Map work and Practical Geography, III Ed.,Vikas Publishing House, New Delhi.
2. Gupta,K K and Tyagi V C, Working with Maps, Survey of India, Department of Science and Technology, Government of India, Dehra Dun 1992.
3. Jackie Smith B.A.(Ed), Dictionary of Geography, Cosmo Publications, New Delhi, 1983.
4. John and Keats, Cartographic Design and Production, II Edition, 1989, John Wiley, New York.
5. Mishra R P, Fundamentals of Cartography, 1969, Prasaranga, University of Mysore, Mysore.
6. Phyllis Dink, Map work X (Ed) Atma Ram and Sons, Delhi, 1967.
7. Raisz E, General Cartography, 1948, Tata McGraw Hill, New York.
8. Singh,R.L.,Elements of Practical Geography, Kalyani Publishers, New Delhi, 2013.

Skill Enhancement Course SEC1 : Political Science

BAE III.4D : LEGISLATIVE SUPPORT

Credits: 3 (2L+1T+0P) **Max. Marks: 100**
Contact Hours per week: 4 **C1+C2: 50**
Exam duration: 2 Hrs. **C3: 50**

Objectives

To acquaint the student broadly with the legislative process in India at various levels, introduce them to the requirements of peoples' representatives and provide elementary skills to be part of a legislative support team.

COURSE CONTENTS:

Unit I: Powers and functions of people's representatives at different tiers of governance

Members of Parliament, State Legislative Assemblies, functionaries of rural and urban local self-government from Zilla Parishads/Municipal Corporation to Panchayat/Ward.

Unit II: Supporting the legislative process:

Howa Bill becomes a Law, Role of the Standing Committee in reviewing a Bill, Legislative Consultations, amendments to a Bill, the framing of Rules and Regulations.

Unit III: Supporting the legislative committees

Types of committees, Role of committees in reviewing government finances, policy, programmes, and legislation. Reading the budget document: Overview of Budget Process, Role of Parliament in reviewing the Union Budget, Railway Budget, Examination of Demands for Grants of Ministries, Working of Ministries.

Unit IV: Support in media monitoring and communication:

Types of media and their significance for legislators. Basics of communication in print and electronic media.

References:

1. Madhavan,M.R.&N.Wahi ***Financing of Election Campaigns*** PRS,Centre for Policy Research, New Delhi, 2008:
2. http://www.prsindia.org/uploads/media/conference/Campaign_finance_brief.pdf
3. Vanka,S. ***Primer on MPLADS*** Centre for Policy Research, New Delhi, 2008. canbeaccessedon:http://www.prsindia.org/parliamenttrack/primers/mplads-487/
4. Kalra, H. ***Public Engagement with the Legislative Process*** PRS, Centre for PolicyResearch,NewDelhi,2011.canbe accessed on: http://www.prsindia.org/administrator/uploads/media/Conference%202011/Public%20Engagement%20with%20the%20Legislative%20Process.pdf
5. Government of India Lok Sabha Secretariat) ***Parliamentary Procedures (Abstract Series)***, 2009. Can be accessed on: http://164.100.47.132/LssNew/abstract/index.aspx
6. Government of India, (Ministry of Parliamentary Affairs) ***Legislation, Parliamentary Procedure,*** 2009. Can be accessed on: http://mpa.nic.in/Manual/Manual_English/Chapter/chapter-09.htm

7. GovernmentofIndia,(Ministryof ParliamentaryAffairs)***Subordinate Legislation*,*ParliamentaryProcedure,***2009.Can be accessedon: http://mpa.nic.in/Manual/Manual_English/Chapter/chapter-11.htm
8. Kapur, Devesh and Pratap Banu Mehta, "The Indian Parliament as an Institution of Accountability,"*Democracy,Governance and Human Rights,* Programme Paper Number 23,United Nations Research Institute for Social Development, January 2006. Can be accessed on: http://www.unrisd.org/UNRISD/website/document.nsf/240da49ca467a53f80256b4f005ef245/8e6fc72d6b546696c1257123002fcceb/$FILE/KapMeht.pdf
9. Agarwal,O.P.andT.V.Somanathan,"PublicPolicyMakinginIndia:Issuesand Remedies,"February,2005. Can be accessed on: http://www.cprindia.org/admin/paper/Public_Policy_Making_in_India_14205_TV_SOMANATHAN.pdf.
10. Debroy,Bibek,"Why we need law reform,"***Seminar*** January 2001.
11. Mehta, Pratap Bhanu, "India's Unlikely Democracy: The Rise of Judicial
12. Sovereignty,"***Journal of Democracy*** Vol.18,No.2,pp.70-83.

Government links:

http://loksabha.nic.in/;http://rajyasabha.nic.in/;http://mpa.nic.in/
13. Sanyal,K.***Strengthening Parliamentary Committees*** PRS, Centre for Policy Research,New Delhi, 2011.can be accessed on: http://www.prsindia.org/administrator/uploads/media/Conference%202011Strengthening%20Parliamentary%20Committees.pdf
14. Celestine, A.***How to read the Union Budget*** PRS, Centre for Policy Research, New Delhi, 2011. can be accessed on: http://www.prsindia.org/parliamenttrack/primers/how-to-read-the-union-budget-1023/

PROFESSIONAL EDUCATION COURSES

BAE III.5 : CHILDHOOD AND GROWING UP

Credits: 4 (3L+ 1T +0P) **Marks: 100**
Contact hrs per week: 5 **C1 + C2: 50**
Exam Duration: 2 hrs **C3: 50**

Objectives :

The student teacher will be able to:

- Understand the salient features and problems of growth and development during childhood to adolescence.
- Understand the dynamics of personality development in order to facilitate student trainees' and their students' personal growth.
- Develop the ability to apply the knowledge provided by Educational Psychology to classroom problems of various kinds.
- Understand the intra and inter individual differences in the learners and their Implications for organizing educational programmes.
- Acquire the skills of understanding the needs of all the learners in the classroom and meeting their needs.
- Appreciate the contribution of psychology in realizing the objectives of education.

COURSE CONTENT

Unit I : Nature of Human Development and Educational Implications

Concept and Branches of Psychology; Importance of Study of Psychology by Classroom Teachers, Meaning of Growth and Development. Differences between growth and development, importance of growth and development for the teachers. Principles of Development, Factors Influencing Growth and Development ; Role of Heredity and Environment in Determining individual Differences in Development. Developmental Stages and Tasks, Development during Early Childhood, Late Childhood and Adolescence-Characteristics, Factors Influencing and Educational Implications:(a) Physical (b) Psychomotor (c) Intellectual (d) Language (e) Emotional (f) Social and (g) Moral and Value Development

Unit II : Management of Issues and Concerns of Adolescent Students Factors Affecting Adolescent development; Issues and Concerns during Adolescence - Physical and Health concerns, Emotional Issues, Social Issues, Socio-cultural diversity, Adverse Life experiences, Identity Vs Role Confusion; Adolescent Cognition and its effect on Adjustment, Need and Importance of Adolescence Education, Significance of Life Skill Education for Adolescence, Role of Schools for the Balanced Personality

Unit III: Individual Differences in Learners Individual Differences in - Psycho-Motor skills, Intelligence, Aptitude, Personality, Learning styles and Cognitive Preferences, Self concept and Self-esteem, Social-Emotional Development, Aptitude, Interest, Attitude and Values and Study Habits.

Unit IV : Assessment of Individual and Intra Individual Differences in Learners

Tools and Techniques: Psychological Tests, Observation Schedules, Inventories, Checklists, Anecdotal Records, Cumulative Records, Sociometry, Interview Techniques, Achievement and Diagnostic Tests.

Meeting the Individual Differences in the Classroom- General Approaches; Remedial Instruction, Guidance and Counseling, Whole School Approach.

Practicum

Administering Group Tests
Conducting Case Studies
Diagnosing the deviations
Studying School Record and preparing Reports.
Getting Famililiarised with Individual Psychological Tests.

References:

1. Bigge, M.L. (1982). *Learning Theories for Teachers,* (4th edition). New York, Harper and Row Publishers, pp. 89-90.
2. Bolles, R.C. (1975). *Learning Theory*. New York, Holt, Rinehart and Winston, pp. 18-19.
3. Chauhan, S.S. (1978). *Advanced Educational Psychology*, Vikas Publishing House Pvt. Ltd., New Delhi.
4. Dandapani, S. (2001). *A textbook of Advanced Educational Psychology*. New Delhi: Anmol Publications.
5. Dunn, R. (1983). *Can students identify their own Learning Styles?* Educational Leadership, 40, pp. 60-62.
6. Dash, M. (1988). *Educational Psychology*. Delhi: Deep and Deep Publication.
7. Duric, L. (1975). *Performance of Pupils in the Process of Instruction*. Bratislava, SPN, pp. 54-90.
8. Duric, L. (1990). *Educational Sciences: Essentials of Educational Psychology*. International Bureau of Education, UNESCO, New Delhi, Sterling Publishers, p. 81.
9. Fontana, D. (1995). *Psychology for Teachers* (3rd edition). The British Psychological Society, London: McMillan in association with BPS Books.
10. Kumar, S. (2014). Child Development and Pedagogy, Pearson.
11. Kundu C.L. and Tutoo, D.N. (1993). *Educational Psychology*, Sterling Publishers Pvt. Ltd.
12. Lindgren, H.C. (1967). *Educational Psychology in Classroom* (3rd edition). New York: John Wiley and sons.
13. Mohan J. and Vasudeva P.N. (1993). *Learning Theories and Teaching, In Mohan Jitendra (ed.) Educational Psychology*, New Delhi, Wiley Eastern Limited, P. 146.
14. Murthy, CGV and Rao, AVG. (2005). *Life skills Education: Training Package*, Mysore: Regional Institute of Education.
15. NCERT (2013) *Training and Resource materials in Adolescence Education*, New Delhi
16. Oza, D.J. and Ronak, R.P. (2011). *Management of behavioral problems of children with mental retardation*. Germany: VDM publication.
17. Papalia D.E., and Sally, W.O. (1978). *Human Development*. McGraw Hill Publishing Company.
18. Phens, J.M., and Evans, E.D. (1973). *Development and Classroom Learning: An Introduction to Educational Psychology*. New York: Holt Rinehart and Winston Inc.
19. Tessmer, M., and Jonassen, D. (1988). *Learning Strategies: A New Instructional Technology*. In Harris Duncun (1988) Education for the New Technologies, World Year Book of Education. London: Kogan page Inc.
20. Skinner, E.C. (1984). *Educational Psychology*-4th Edition. New Delhi: Prentice Hall of India Pvt. Ltd.
21. Spinthall, N., and Spinthall, R.C. (1990). *Educational Psychology* 5th Edition. McGraw Hill Publishing Company.

Web Resources

- Animated Videos from Study.com, http://study.com/academy/course/educational-psychology-course.html
- Seifert, K. and Sutton, R. 2011). Educational Psychology Third Edition http://www.oercommons.org/courses/educational-psychology/view
- Introduction to Psychology, Open Textbook, http://open.lib.umn.edu/intropsyc/
- Generic Issues, NCERT, http://www.ncert.nic.in/departments/nie/dse/activities/advisory_board/PDF/generic.pdf
- www.aeparc.org

BAE III.6 : Gender, School and Society

Credits: 2 (1L+ 1T +0P) **Marks: 100**
Contact hrs per week: 3 **C1 + C2: 50**
Exam Duration: 2 hrs **C3: 50**

Objectives:
This course enables the student teachers to
- Understand and contextualize ideals of the Constitution of India;
- Appreciate humanistic agenda of the Constitution of India;
- Value and recognize the role of education in realizing the ideals of the Constitution;
- Analyse various educational contexts to see whether the child's rights are ensured
- Understand and develop positive attitudes towards various forms of exclusions;
- Appreciate the measures taken at the national level to universalize elementary and secondary education;
- Analyse the contextual examples to understand the gender issues and concerns;
- Develop positive attitude and values towards promoting gender equality;
- Evolves strategies and mechanisms as a teacher to ensure equality in school and learning contexts

COURSE CONTENT:

Unit I: Education as Fundamental Right
Constitution of India : Fundamental rights; Education as Fundamental right; Human Rights: Meaning, Nature, and classification; Rights of Children: International covenants and Indian Constitution; Education as Fundamental Right of Children: 2009, Rights of girl child

Unit II: Policy framework for public Education in India and its implementation
Education in Post-Independent India: Significant recommendations of commissions and committees, National Policy on Education-1986, Revised 1992, Delors Report: learning the treasure within, Universalization of elementary education: Need and significance; Government schemes and efforts with special focus on Sarva Shiksha Abhiyan, Issues in implementing RTE-2009: A critical understanding. Issues that affect and negate the children's right to education(Child labour: Street children, abandoned and orphans; Differently abled children; Attitude towards the girl child and her participation in schooling; Punishment, abuse and violence in schools). alternative schooling, Secondary education: Universalization of secondary education; universal access, universal enrollment, universal retention, universal success; Issues and Quality concerns- Recommendations of CABE; interventions of RMSA, Initiatives and measures taken at national level to improve teacher education at secondary level: Role of NCTE and NCERT

Unit III: Contemporary Indian Schooling: Concern and Issues

Equality of Educational Opportunity: Meaning and nature; Forms of inequality: Caste, Gender, Transgender, regional, religious and other marginalized groups;
Inequality in Schooling: Public- private schools, Rural-urban schools, Mass-elite schools, single teachers' schools and many other forms of in equal school systems. Positive discrimination: concept and issues and policy intervention;
Understanding Exclusion in schooling: Exclusion: Meaning, and nature; Forms of Exclusion:
Physical/physiological Exclusion; Different kinds/types of differently abled children: Measures to address the issues of leaning of differently abled children and professional preparedness of institutions;
Socio-cultural and economic exclusion
Understanding different forms of socio-cultural and economic exclusion in schooling—Caste, Class, Gender, Minority, and other Marginalized sections of the society;
Critical understanding of 'ascribed identities' on educational opportunities;

Unit IV: Gender: Issues and concerns
Basic Gender concepts: Difference between Gender and Sex; Social construction of Gender; Gender roles as viewed in Indian context; Concept of Transgender
Gender roles in society through various institutions such as family, caste, religion, culture, media and popular culture (films, advertisements, songs etc), law and State; stereotype in gender roles
Issues related to women/girl child: female infanticide and feticide, sex ratio, honour killing, dowry, child marriage, property rights, divorce, widowhood.
Gender bias in school enrolments, household responsibilities, societal attitude towards girl's education
Issues related to gender in school: sexual abuse, sexual harassment, perception of safety at school, home and beyond
Representation of gendered roles, relationships and ideas in textbooks and curricula.
Role of schools, peers, teachers, curriculum and textbooks in challenging gender inequalities or reinforcing gender parity
The Indian constitution and provisions accorded to women; women's rights; legal aspects related to women, indecent representation of women (Prohibition act), cybercrime:
Educational and Employment provisions for Transgender: Legal aspects; social recognition

Sessional activities
- A critical study, with the help of survey and observational study, of alternative schools-child labour schools, night schools, mobile schools and boat schools.
- Critical analysis of different committees and commissions on Education
- Readings on National Policy on Education, RTE Act 2009, Delors Report
- Survey of schools to see the implementation of various incentives of government to equalize educational opportunities
- Textbook analysis for identifying integration of gender issues.
- Prepare presentation on laws related to women harassment, early marriage, property inheritance, trafficking etc.
- Prepare presentations on constitutional provisions and other government measures to promote girl child's education
- Presentation of Case study reports on girl child's problems in schools and at home.

References:
1. Anand, C.L. et.al. (1983). Teacher and Education in Emerging in Indian Society, NCERT, New Delhi.
2. Govt. of India (1986). National Policy on Education, Min. of HRD, New Delhi.
3. Govt. of India (1992). Programme of Action (NPE). Min of HRD.

4. Mistry, S.P. (1986). Non-formal Education-An Approach to Education for All, Publication, New Delhi.
5. Mohanty, J., (1986). School Education in Emerging Society, sterling Publishers.
6. Mukherjee, S.N. (1963). Secondary School Administration, Acharya Book Depot, Baroda.
7. Mukherji, S.M., (1966). History of Education in India, Acharya Book Depot, Baroda.
8. Naik, J.P. & Syed, N., (1974). A Student's History of Education in India, MacMillan, New Delhi.
9. NCERT (1986). School Education in India – Present Status and Future Needs, New Delhi.
10. Salamatullah, (1979). Education in Social context, NCERT, New Delhi.
11. Sykes, Marjorie (1988): The Story of Nai Talim, Naitalim Samiti: Wardha.
12. UNESCO; (1997). Learning the Treasure Within.
13. Dr. Veda Mitra. Education in Ancient India, Arya book Depot, New Delhi – 1967
14. Reports of SSA and RMSA
15. NCTE (2009) National curriculum framework for teacher education
16. Agarwal, N (2002). Women and Law in India. New Delhi: New century Pub
17. Sen,S.(2013). Women's rights and empowerment. New Delhi: Astha Pub.
18. Siddiqi, F.E.& Ranganathan,S.(2001). Handbook on women and human rights, New Delhi: Kanishka Pub

Web Resources: Video on improving Gender Equality- EFA Crowdsourcing Challenge, 2012, UNESCO, Pub by The Pearson Foundation, 3 minutes.

BAE III.7 : School Attachment Programme 1

Credits : 2 **Marks: 100**
Duration: 3 Weeks **C1+C2 : 50**
C3 : 50

Objectives

- To familiarize the student teachers to school environment, its structure, functions and processes.
- To familiarize the student teachers with different types of schools existing in the communit**y.**

COURSE CONTENT:

1. The student teachers will visit the neighbourhood schools for one week to get acquainted with the school environment and its functions and processes and submit the report.
2. The student teachers will familiarize themselves with school structure and administration.
3. The student teachers will visit different types of schools such as Government, Government aided and private schools to study their governing norms, regulations and participation in the community.
4. The student teachers will visit the schools run by community/NGO or other organizations like minority run schools, schools in SC/St dominated areas, schools in slum areas, special and inclusive schools and submit the report.

Community Based Activities: Objectives

- To develop an awareness and understanding of educational status of the community.
- To create an awareness of the implementation of various programmes of the government related to school education through field experiences and community participation.

Activities

- The student teachers will visit the local community to study the drop out/ out of school children and the modes of alternative education received by them.
- Organize awareness programmes in the selected community on literacy, human rights, gender sensitization, environmental conservation etc through street play, role play and dramatization.
- To interact with community members like zilla parishat members, SDM and PTA members to study about their participation in school development programmes

Evaluation:

C1 – Report 1
C2 – Report 2
C3 – PPT presentation of community based activities

FOURTH SEMESTER

Core Course 1 D : English Literature

BAE IV.1 : TWENTIETH CENTURY BRITISH LITERATURE

Credits 4 (3L+1T+0P) **Max. Marks: 100**
Contact Hours per week: 5 **C1+ C2: 50**
Exam duration: 2 Hrs **C3: 50**

Objectives:

- To offer student teachers perspectives and insights into the heterogeneous themes and schools that populated Twentieth Century British Literature – movements like symbolism, imagism, movement poetry, Theatre of the absurd, postmodernism.
- To help student teachers an understanding of the most influential novelists and essayists of Twentieth Century British Literature.
- To provide student teachers a deeper perspective into themes that dominated twentieth century British poetry.
- To offer the student teachers a facsimile of the seminal influences in twentieth century British theatre.
- To provide detailed introspections on the contributions made by some of the contemporary writers and so equip the student teachers with scholarly insights into the contemporary English literature.

COURSE CONTENT :

Unit I : Poetry

W. B. Yeats : "The Second Coming"
T. S. Eliot : "Journey of the Magi" , Love Song of Alfred J Prufrock
W. H. Auden : "Musee des Beaux Art"
Stephen Spender : "The Pylons"
Wilfred Owen : "Strange Meeting"
D. H. Lawrence : "Snake"

Unit II : Poetry

Dylan Thomas: "A Child's Christmas in Wales"
Philip Larkin : "Whitsun Weddings"
Ted Hughes : "Jaguar"
Geoffrey Hill : "September Song"
Seamus Heaney : "Punishment"
Tony Harrison : "Marked with D"
Thom Gunn : "At the Barriers"
R. S. Thomas : "Album"
Sylvia Plath : "Lady Lazarus"
Ted Hughes : The Thought Fox

Unit III : Drama

Samuel Becket : Waiting for Godot
T.S.Eliot : Murder in the Cathedral
J.M.Synge : Riders to the Sea
John Osborne : Look Back in Anger

Unit IV : Fiction & Prose
William Golding : The Lord of the Flies
D. H. Lawrence : Sons and Lovers
John Fowles :The French Lieutenant's Woman
Eliot : Hamlet and His Problems, Tradition and Individual Talent
Martin Esslin : Introduction. Absurd Drama
Bertolt Brecht : Selections from A Short Organum for the Theatre: Prologue and Sections 1-25

References :

1. Raymond Williams : Forms in Culture, Introduction to the English Novel from Dickens To Lawrence (London: Hogeath, 1984)
2. John Lucas : Modern English Poetry from Hardy to Hughes
3. Kenner, Hugh, A Reader's Guide to Samuel Beckett (London, 1996)
4. Smith,C.Grover, T.S.Eliot's Poetry and Plays (London, 1974)
5. Kenner, Hugh, The Invisible Poet: T.S.Eliot (London, 1974)
6. Boly, John R., Reading Auden: The Return of Caliban (London, 1991)
7. Hecht, Anthony, The Hidden Law: The Poetry of W.H.Auden (London, 1993)
8. Armstrong, Tim, Modernism, Technology and the Body: A Cultural history (Cambridge, 1998)
9. E.M.Forster: A Life: The Growth of the Novelist 1879-1914 (London, 1977)
10. Das, G.K., and Beer, John (eds), E.M.Forster: A Human Exploration (London, 1979)
11. Batchelor, John, The Life of Joseph Conrad: A Critical Biography (Oxford, 1994)
12. Guerard, Albert, Conrad the Novelist (Cambridge, Mass., 1958)
13. Nicoll, Allardyce, English Drama 1900-1930: The Beginnings of the Modern Period (Cambridge, 1973).
14. McLaurin, A., Virginia Woolf: The Echoes Enslaved (London, 1973).
15. Bowlby, Rachel, Virginia Woolf: Feminist Destinations, 2nd edn. (London, 1997)
16. Pilling, John (ed.), The Cambridge Companion to Samuel Beckett (Cambridge, 1994)
17. Curtis, Tony (ed.), The Art of Seamus Heaney (Bridgend, 1982)
18. Morrison, Blake, Seamus Heaney (London, 1982)

Core Course 2 D : History

BAE IV.2 : HISTORY OF POST-INDEPENDENT INDIA

Credits 4 (3L+1T+0P) **Max. Marks: 100**
Contact Hours per week: 5 **C1+ C2: 50**
Exam duration: 2 Hrs **C3: 50**

Objectives:
After completion of the course, the student-teacher will be able to

- Understand the developments that undertook in India such as the process of Constitution making,
- problems of Indian languages,
- consolidation of India as a nation and the
- process of democracy,

COURSE CONTENT:

Unit I: Making of the Constitution -
Basic Features - Institutions - Working of the Constitution

Unit II: The Initial Years
Consolidation - Linguistic Reorganization - Building a secular nation

Unit III: Consolidating the Nation
Political Parties - Foreign Policy - Economy

Unit IV: Test of Democracy
Social reforms in South: Narayana Guru, Periyar, Gora and Hemalata Lavanam Peasant Movements Workers Movements Tribal Unrest Emergency Years Dalit movements Women's movements

References:

1. Hunashall, S.M., The Lingayat Movement-A Social revolution in Karnataka, Dharwar, 1947
2. Sughata, Bose and Ayesha Jalal, Modern South Asia (History, culture and Political Economy), Oxford University Press, Delhi, 1999
3. Baily, C.A., Origins of Nationality in South Asia**,** Oxford, Delhi, 1998
4. Peter Heehs, Nationalism, Terrorism and Communalism, Oxford University Press, Delhi, 1998
5. Sharma R.R. (Ed.), The USSR in Transition: Issues and Themes, New Delhi, 1995
6. David Taylor and Malcoim (Ed.), Political Identity in South Asia, Centre of South Asian Studies, London, 1978
7. Govind Kelkar, China after Mao, Usha Publishers, New Delhi
8. Hall, D.G.E., History of South-East Asia, MacMillan Education Limited, Hampshire, 1995
9. Arjun Dev, Contemporary World, NCERT, New Delhi
10. Urmila Phadnis, Towards Integration of Indian States, New Delhi, 1988
11. Peter Heehs, Modern India and the World**,** Oxford University Press, New Delhi

Core Course 3 D : Geography
BAE IV.3A: GEOGRAPHY OF INDIA

Credits 4 (3L+0T+1P) **Max. Marks: 100**
Contact Hours per week: 5 **C1+ C2: 50**
Exam duration: 2 Hrs **C3: 50**

Objectives:
The course is aimed at presenting a comprehensive, integrated and empirically based profile of India. Besides, the objective is to highlight the linkages of systematic geography of India with the regional personality of the country. The course is designed so as to present the role of the geographical positioning of India in moulding its geopolitical personality and its inter-relations with other countries.

COURSE CONTENTS:

Unit I: **Physical India**
Locational Characteristics. Physiographical Divisions of India. Drainage Systems. Major River System of India. Soil: Characteristics, Types and Distribution in India.

Unit II: **Climate**
Factors influencing climate of India. The mechanism of Monsoon, Regional and Seasonal Variation in Temperature and Rainfall. Climatic regions of India. Droughts and Floods in India.

Unit III: **Natural Resources**
Natural Vegetation Classification distribution and Mineral's resources: Distribution, Reserves and Production of Iron ore, Manganese, Bauxite, Mica, Gold and Silver.

Unit IV: Population and Economy
Growth and Spatial distribution of Population. Urbanization. Green Revolution. Indian agriculture and major crops: Rice, Wheat, Cotton, Sugarcane and Tea. Agricultural regions. Major Industries and Industrial regions of India.

References:

1. Deshpande C.D: India-A Regional Interpretation Northern Book Centre, New Delhi.1992.
2 Economic and Commercial Geography of India. T.C Sharma. O. Coutinho Vikas Publishing House Pvt. Ltd. New Delhi-14.
3. Govt. of India: India –Reference Annual, 2001 Pub. Div, New Delhi, 2001.
4. Govt. of India: National Atlas of India, NATMO Publication, Calcutta.
5. Govt. of India: The Gazetteer of India.Vol I & III Publication Division, New Delhi, 1965.
6. Learmonth,A.T.A.et.al(ed.):Man and Land of South Asia Concept, New Delhi.
7. Mitra,A.:Levels of Regional Development India Census of India,Vol I, PartI- A(i) and (ii) New Delhi, 1967.
8. Shafi, M: Geography of South Asia, McMillan & Co., Calcutta, 2000.
9. Singh,R.L.(ed.):India:A Regional Geography.National Geographical Society. India,Varanasi, 1971.
10. Spate,O.H.K.and Learmonth,A.T.A.; India and Pakistan- Land, People and Economy Methuen & Co., London, 1967.
11. Valdiya, K.S.:Dynamic Himalaya, University Press, Hyderabad, 1998.

12. Wadia, D.N.: Geology of India, McMillan & Co.,London, 1967.

PRACTICALS

Exam Duration: 3hrs **C_3: 50**

COURSE CONTENT:

1. **Meteorological Instruments**: Thermometers, Maximum and Minimum, Wet and dry bulb Thermometer, Barometer: Mercury Barometer, Aneroid Barometer, Wind vane, Anemometer, Rain gauge – dial type.
2. **Interpretation of IMD Weather Maps**: Signs and Symbols. Interpretation: IMD Weather Maps (One map each season)
3. **Importanceof Topographical maps**: Types of topographical maps based on scale. Conventional Signs and Symbols: Representing Physical and Cultural features.
4. **Interpretation of Toposheets**: Marginal information of toposheets, Relief, Drainage, Vegetation, Settlements, Transportation and Communication

References:

1. Raisz E, General Cartography, 1948, Tata McGraw Hill, New York.
2. Singh, R.L., Elements of Practical Geography, Kalyanj Publishers, New Delhi, 1979

Core Course 3 D : Political Science

BAE IV.3B : COMPARATIVE GOVERNMENT AND POLITICS

Credits 4 (3L+1T+0P) **Max. Marks: 100**
Contact Hours per week: 5 **C1+ C2: 50**
Exam duration: 2 Hrs **C3: 50**

Objectives: After completing the course the student teachers will be able to understand and comprehend:

- about the meaning, nature, scope, evolution, approaches and significance of Comparative Government and Politics
- significance of constitutionalism and Western and Non-Western, Constitutional governments and Classification of Constitutions
- Comparative political Structures of Malaysia, Canada and South Africa and
- Political Dynamics, Political Parties, Pressure groups, and Electoral System in USA, Malaysia, Canada and South Africa.

COURSR CONTENT

Unit I: Introduction
Meaning, nature, scope, evolution and significance. Approaches (traditional and modern) of Comparative Government and Politics

Unit II: Constitutionalism
Western and Non-Western, Constitutional government and Classification of Constitutions

Unit III: Comparative political Structures
Executive, Legislature and judiciary in Malaysia, Canada and South Africa

Unit IV: Political Dynamics
Political Parties, Pressure groups, and Electoral System in Malaysia, Canada and South Africa

References

1. Hugh, G., Thorburn, *Party Politics in Canada*, Prentice Hall, New Delhi, 1985.
2. Johari, J.C., *Comparative Politics*, Sterling Publications, New Delhi, 1982.
3. Klug, Heinz, *The Constitution of South Africa*, Hart Publishers, Oxford, England, 2010.
4. Martin, Rod, Hague, 10th Edition *Comparative Government and Politics*, Macmillan, 2016.
5. Wiarda, J., Howard, Skelly, Esther M., *Comparative Politics Approaches and Issues*, Rowman and Little Field, 2007.

SKILL ENHANCEMENTCOURSE SEC 2 : ENGLISH LITERATURE

BAE IV.4A : THEATRE STUDIES

Credits 3 (2L+1T+0P) **Max. Marks: 100**
Contact Hours per week: 4 **C1+ C2: 50**
Exam duration: 2 Hrs **C3: 50**

Objectives:
- To provide an introduction to theatre studies
- Familiarize the students with fundamental theories on theatre
- Introduce the students to Western and Indian
- To sensitize students that theatre is praxis
- To develop the listening and writing skill of students
- To help students appreciate theatre
- Respond creatively to the world around

COURSE CONTENT:

Unit I : Origin of Drama

Origin of Western theatre- eminent Greek playwrights – Chorus and its evolution – miracle, morality and mystery plays – Aristotle's theory of drama – Elizabethan stage – Restoration theatre.

Unit II: Introduction to Indian theatre.

Bharata and Natya sastra - relevance – contributions of Bhasa and Kalidasa – dance drama – folk theatre - Kathakali – Kutiyattam – Yakkshagana- recent trends in Indian theatre.

Unit III: Problems in Play

Trends in 20th century drama - Epic theatre – Theatre of Cruelty- Total Theatre- Absurd theatre – Postcolonial theatre

Unit IV: Writing dialogues

Preparation of script for acting based on narratives/stories/reports – Learning the process of staging a play through an enactment of the prepared script(s) which may be group activity in the class. The class may be divided into groups and they can be assigned specific tasks involved in the production of a play such as script writing, stage setting, properties, make up and music which can finally lead to the production of the script.
(This module must be effectively used by the teacher for internal/continuous assessment and so no separate texts for study are provided

References:

1. John Gassner and Edward Quinn. The Reader's Encyclopedia of World Drama. London: Methuen, 1975.
2. Harold Bloom Ed. Greek Drama Philadelphia: Chelsea House.
3. Peter Womack. English Renaissance Drama Oxford: Blackwell. 2006
4. P.Venugopalan Ed. Kutiyattam Register"Kutiyattam" Thiruvananthapuram: Margi, 2007.21–34.
5. K.P.S. Menon. A Dictionary of Kathakali. Orient Blackswan
6. Martin Esslin – Theatre of the Absurd

Skill Enhancement Course SEC 2 History

BAE IV.4B : ARCHIVES AND MUSEUMS

Credits 3 (2L+1T+0P) **Max. Marks: 100**

Contact Hours per week: 4 **C1+ C2: 50**
Exam duration: 2 Hrs **C3: 50**

Objectives

This course introduces students to the institutions that house and maintain documentary, visual and material remains of the past. Museums and archives are among the most important such repositories and this course explains their significance and how they work. Students will be encouraged to undertake collection, documentation and exhibition of such materials in their localities and colleges. Visit to National Archives and National Museum are an integral part of the course.

COURSE CONTENT:

Unit I : Definition and history of development (with special reference to India)

Unit II: Types of archives and museums:

Understanding the traditions of preservation in India Collection policies, ethics and procedures. Collection: field exploration, excavation, purchase, gift and bequests, loans and deposits, exchanges, treasure trove confiscation and others. Documentation: accessioning, indexing, cataloguing, digital documentation and de-accessioning Preservation: curatorial care, preventive conservation, chemical preservation and restoration

Unit III: Museum Presentation and Exhibition

Unit IV: Museums, Archives and Society: Education and communication Outreach activities

References:

1. Saloni Mathur, India By Design: Colonial History and Cultural Display, University of California, 2007.
2. Sengupta, S. Experiencing History Through Archives. Delhi: Munshiram Manoharlal.2004.
3. Guha,Thakurta, Tapati, Monuments, Objects, Histories : Institution of Art in Colonial India, New York,2004
4. Kathpalia,Y.P. Conservation and Restoration of Archive Materials.UNESCO,1973
5. Choudhary,R.D. Museums of India and their maladies. Calcutta: AgamKala.1988
6. Nair,S.M. Bio-Deterioration of Museum Materials.2011
7. Agrawal,O.P., Essentials of Conservation and Museology, Delhi, 2011

Skill EnhancementCourse SEC 2 Geography

BAE IV.4C : DISASTER MANAGEMENT

Credits 3 (2L+1T+0P) **Max. Marks: 100**
Contact Hours per week: 4 **C1+ C2: 50**
Exam duration: 2 Hrs **C3: 50**

Objectives:
The objectives of this course are to acquaint the students with the concept of disaster and hazards. To create awareness and preparedness for the natural as well as manmade hazards

COURSE CONTENT:

Unit I : Disasters
Definition and Concepts: Hazards, Disasters; Risk and Vulnerability; Classification

Unit II: Disasters in India
Flood: Causes, Impact, Distribution and Mapping; Landslide: Causes, Impact, Distribution and Mapping; Drought: Causes, Impact, Distribution and Mapping ; Earthquake and Tsunami: Causes, Impact, Distribution and Mapping; Cyclone: Causes, Impact, Distribution and Mapping.

Unit III: Manmade Disasters
Causes, Impact, Distribution and Mapping

Unit IV: Response and Mitigation to Disasters
Mitigation and Preparedness, NDMA and NIDM; Indigenous Knowledge and Community-Based Disaster Management; Do's and Don'ts During and Post Disasters

References:

1. Government of India. (1997) Vulnerability Atlas of India. New Delhi, Building Materials & Technology Promotion Council, Ministry of Urban Development, Government of India.
2. Kapur, A. (2010) Vulnerable India: A Geographical Study of Disasters, Sage Publication, New Delhi.
3. Modh, S. (2010) Managing Natural Disaster: Hydrological, Marine and Geological Disasters, Macmillan, Delhi.
4. Singh, R.B. (2005) Risk Assessment and Vulnerability Analysis, IGNOU, New Delhi. Chapter 1, 2 and 3
5. Singh, R. B. (ed.), (2006) Natural Hazards and Disaster Management: Vulnerability and Mitigation, Rawat Publications, New Delhi.
6. Sinha, A. (2001). Disaster Management: Lessons Drawn and Strategies for Future, New United Press, New Delhi.
7. Stoltman, J.P. et al. (2004) International Perspectives on Natural Disasters, Kluwer Academic Publications. Dordrecht.
8. Singh Jagbir (2007) "Disaster Management Future Challenges and Opportunities", 2007.Publisher- I.K. International Pvt. Ltd. S-25, Green Park Extension, Uphaar Cinema Market, New Delhi, India (www.ikbooks.com).

Skill EnhancementCourse SEC 2 Political Science

BAE IV.4D: PUBLIC OPINION AND SURVEY RESEARCH

Credits 3 (2L+1T+0P) **Max. Marks: 100**
Contact Hours per week: 4 **C1+ C2: 50**
Exam duration: 2 Hrs **C3: 50**

Objective:
This course will introduce the students to the debates, principles and practices of public opinion polling in the context of democracies, with special reference to India. It will familiarize the students with how to conceptualize and measure public opinion using quantitative methods, with particular attention being paid to developing basic skills pertaining to the collection, analysis and utilization of quantitative data.

COURSE CONTENT:
Unit I: Introduction to the course
Definition and characteristics of public opinion, conceptions and characteristics, debates about its role in a democratic political system, uses for opinion poll

Unit II: Measuring Public Opinion with Surveys: Representation and sampling
What is sampling? Why do we need to sample? Sample design.
Sampling error and non-response
Types of sampling: Non random sampling (quota, purposive and snowball sampling); random sampling: simple and stratified

Unit III: Survey Research
Interviewing: Interview techniques pitfalls, different types of and forms of interview
Questionnaire: Question wording; fairness and clarity.

Unit IV: Quantitative Data Analysis
Introduction to quantitative data analysis
Basic concepts: correlational research, causation and prediction, descriptive and inferential Statistics, Interpreting polls: Prediction in polling research: possibilities and it falls Politics of interpreting polling

Suggested Student Exercises:
1. Discussion of readings and Indian examples.
2. Groups of students to collect examples of and discuss various sample based studies across many fields: e.g. consumer behaviour, unemployment rates, educational standards, elections, medicinal trialsetc.
3. Non-random sampling: The students have to identify one group of people or behavior that is unique or rare and for which snowball sampling might be needed. They have to identify how they might make the initial contact with this group to start snowball rolling.
4. Give the students the electoral list of an area in Delhi (http://ceodelhi.gov.in).The students have to draw a random sample of n number of respondents.
5. For this activity, working with a partner will be helpful. The class should first decide on a topic of interest. Then each pair should construct a five-item self-report questionnaire. Of the five items, there should be at least one nominal response, one ordinal response and one interval. After the common questionnaire is constructed putting together the questions from everyone, working in pairs, the questionnaire should be administered on10 different individuals.
6. Give the students a questionnaire from any public opinion survey and ask them to identify the type of variables.

References

1. R.Erikson and K.Tedin,(2011) *American Public Opinion,*8th edition, New York: Pearson Longman Publishers, pp.40-46.
2. G.Gallup,(1948) *A guide to public opinion polls* Princeton, Princeton University Press, 1948. Pp.3-13.
3. G.Kalton,(1983) *Introduction to Survey Sampling* Beverly Hills,Sage Publication.
4. Lokniti Team(2009) 'National Election Study2009: A Methodological Note', *Economic and Political Weekly,*Vol.XLIV(39)
5. Lokniti Team, (2004) 'National Election Study 2004', *Economic and Political Weekly* ,Vol. XXXIX(51).
6. 'Asking About Numbers:Why and How', *Political Analysis*(2013),Vol.21(1):48-69, (first published online November 21,2012)
7. H.Asher,(2001)'Chapters 3 and 5',in *Polling and the Public: What Every Citizen Should Know,* Washington DC: Congressional Quarterly Press.
8. R.Erikson and K.Tedin,(2011) *American Public Opinion,*8th edition, New York,Pearson Longman Publishers, pp.40-46.
9. Agrestiand B.Finlay,(2009) *Statistical methods for the Social Sciences,* 4th edition,Upper Saddle River,NJ: Pearson- Prentice Hall,
10. S.Kumarand P.Rai,(2013) Chapter1', in *Measuring Voting Behaviour in India,* New Delhi: Sage.
11. R.Karandikar,C.Pyne and Y.Yadav,(2002)'Predicting the 1998 Indian Parliamentary Elections', *Electoral Studies,* Vol.21, pp.69-89.

PROFESSIONAL EDUCATION COURSES

BAE IV.5 : LEARNING AND TEACHING

Credits: 4 (3L+ 1T +0P) **Marks: 100**
Contact hrs per week: 5 **C1 + C2: 50**
Exam Duration: 2 hrs **C3: 50**

Objectives:

The student teacher will be able to:

- Gain the knowledge about the scientific knowledge about the process of learning.
- Understands the Conditions Essential for Facilitating Learning and Retention.
- Apply the Principles and Strategies of Major Approaches to Learning in Classroom Environment.
- Understands the Process of Effective Teaching and Qualities of Effective Teachers.
- Understands various Approaches to Teaching and will be able to apply them in the relevant situations.
- Understands the Principles and Strategies for Creating Conducive Classroom Environment.
- Appreciates the role of a teacher as leader, organizer, a facilitator & a humane reflective practitioner.
- Realize the difficulties in learning and teaching.

COURSE CONTENT

Unit I : Concept and Nature of Learning

Factors Associated with Learning
Maxims of Learning and their Educational Implications
Approaches to Learning(Concept, Associated Concepts Basic Principles and Educational Implications)-Habitual Learning, Associative Learning (Classical and Instrumental Conditioning), Spatial Learning/Cognitive Maps, observational Learning, Learning by Insight, Information Processing Approach, Humanistic Approach, Constructivist Learning Approach
Types of Learning-Concept Learning, Skill Learning, Verbal Learning, Learning of Principles and Problem Solving (Meaning, Nature, Stages, Principles and Approaches/Strategies)

Unit II

Attention-Meaning, Factors Influencing Attention, Strategies for Enhancing Attention;
Perception-Meaning, Laws of Perceptual Organization (Gestalt Psychologists' View) and Educational Implications.
Process of Memory- Sensory Registration, Retention(Storing), Recognition, Recall;

Factors Influencing Retention; Strategies for Enhancing Memory.
Transfer of Learning- Concept, Types, Theories; Strategies for Enhancing Positive Transfer of Learning
Achievement Motivation- Concept, Intrinsic and Extrinsic Motivation; Strategies for enhancing Achievement Motivation in Students.

Unit III: Understanding the process of Teaching-Learning

Teaching as a Profession
Teaching as an Art and Science.
Understanding the Process of Teaching as a Profession

Identifying the need and importance of classroom teaching-learning
Reflective teaching
skillful teaching
Applying the knowledge of Maxims of Teaching
Role of teacher in identifying classroom related problems

Unit IV: Teacher and Teaching as a profession

Various Approaches to Teaching: Behaviourist, Cognitivist, Constructivist, Connectionist, Participatory, Cooperative, Collaborative, Personalized, and Holistic
Teacher as a Facilitator and Guide/Philosopher/Friend
Teachers commitment towards fulfilling Felt Need of Learners

Professional Characteristics of Teacher in Classroom Management.
Skills & Competencies of a Teacher Communication: Meaning, mode::input/process/output
Basic Model of Communication: Sender, Message, Medium, Receiver & Reach; Factors facilitating communication
Effective Classroom Management-Principles and Strategies
Leadership Qualities in Teachers

Practicum

Conducts Projects on –
Identifying the Learning Difficulties of Students in Different School Subjects and the Possible Reason for them;
Providing Remedial Instruction to the Students with Learning Difficulties;
Study the Qualities of Effective Teachers through observation, interview, case study etc.,
Visiting Model Schools and Prepare Reports

References:

1. Benjamin S., Bloom et al. (1964). *Taxonomy of educational objectives*. Longman Group.
2. Bruce Joyce (1985) *Models of teaching* (2nd ed.) Prentice Hall**.**
3. Encyclopaedia of Modern Methods of Teaching and Learning (Vol. 1-5).
4. Gage N.L. Scientific Basis of art of Teaching
5. Gavriel Salomon (1981) *Communication and education* Sage.
6. Lieberman, M. (1956) *Education as a profession*. Prentice Hall, Inc.
7. Karthikeyan, C. (2004). *A Text book on instructional technology*, RBSA.
8. Kumar, S. (2014). Child Development and Pedagogy, Pearson.
9. Ohles, J.F. (1970). *Introduction to Teaching*. New York: Random House, INC.
10. Siddiqui, Mujibul Hasan (2005). *Techniques of classroom teaching* A.P.H
11. Skinner, E.C.(1984). *Educational Psychology. 4th Edition.* New Delhi: Prentice Hall of India Pvt. Ltd.
12. Snowman & Baihler (2006). *Psychology Applied to teaching*. Boston: Houghton Mifflin Company.
13. Stephens, L.M. & Evans, E.D. (1973). *Development and Classroom Learning: An Introduction to Educational psychology*. New York: Holt, Rinehart and Winston, Inc.
14. Tanner, L.N. & Lindgren, H.C. (1971). *Classroom Teaching and Learning*. New York: Holt, Rinehart and Winston, Inc.

Web Resources

1. Courses on Communication Skills, http://nptel.ac.in/courses/109104030/
2. Jane Ciumwari Gatumu, Reflective Teaching, http://oer.avu.org/bitstream/handle/123456789/155/REFLECTIVE-TEACHING.pdf?sequence=1
3. School leadership (2011), http://azimpremjifoundation.org/pdf/learning-curve-16.pdf

BAE IV.6 : DRAMA AND ART EDUCATION

Credits: 4 (3L+ 1T +0P) **Marks: 100**
Contact hrs per week: 5 **C1 + C2: 50**
Exam Duration: 2 hrs **C3: 50**

Objectives

The student teacher will be able to:

- Understand the use of 'Drama' as a Pedagogy.
- Use 'Role play' technique in the teaching learning process.
- Understand the importance of dramatic way of presentation.
- Integrate singing method in teaching learning process.
- Understand various 'Dance forms' and their integration in educational practices.
- Use art of drawing and painting in teaching learning process.
- Develop creativity through different creative art forms.
- Understand the efficacy of different art forms in education.

COURSE CONTENT

Unit I : Drama and its Fundamentals

Creative writing – Drama writing, Drama as a tool of learning, Different Forms of Drama Role play and Simulation, Use of Drama for Educational and social change (Street play, Dramatization of a lesson), Use of Drama Techniques in the Classroom: voice and speech, mime and movements, improvisation, skills of observation, imitation and presentation

Unit II: Music (Vocal & Instrumental)

Sur, *Taal and Laya (Sargam),* Vocal - Folk songs, Poems, Prayers, Singing along with "*Karaoke*", Composition of Songs, Poems, Prayers, Integration of *Vocal & Instrumental* in Educational practices

Unit III: The Art of Dance

Various Dance Forms - Bharat Natyam, Kathakali, Kuchipudi, Yakshagana- Folk dance and various other dances
Integration of Dance in educational practices
(Action songs, *Nritya Natika*)

Unit IV: Drawing and Painting

Colours, Strokes and Sketching- understanding of various means and perspectives, Different forms of painting- Worli art, Madhubani art, Glass painting, Fabric painting and various forms of painting, Use of Drawing and Painting in Education -Chart making, Poster making, match-stick drawing and other forms, Model making – Clay modeling, Origami, Puppet making, Decorative – Rangoli, Ekebana, Wall painting (Mural), Kalameshuthu or any other local art.

Practicum

1. Developing a script of any lesson in any subject of your choice to perform a Play / Drama.
2. Developing a script for the street play focusing on "Girl's education and Women empowerment".
3. Preparing a pictorial monograph on "Various folk dance of South India.

4. Preparing a pictorial monograph on "Various Classical Dance forms in India".
5. Preparing a calendar chart on "Various Musical Instruments in India".
6. Develop an Audio CD based on newly composed Poems of any Indian language.
7. Preparing some useful, productive and decorative models out of the waste materials.
8. Visit the Faculty of Performing Arts in your city and prepare a detailed report on its multifarious functioning.
9. Development a Review of a theatre programme if possible
10. Organize a competition on some Decorative / Performing Art forms in the school during your School Internship programme and prepare a report on it.
11. Organizing a workshop on some selected Creative Art forms in the school during your School Internship programme and prepare a report on it.

*** In addition, school and community based activities may be organized with provisions for visits to innovative centres of pedagogy and learning, innovative schools, educational resource centres, etc. Action research based on teaching learning and school and community could be conducted.**

References:

1. Natyashastra by Bharathamuni
2. Deva, B.C. (1981). An Introduction to Indian Music. Publication Division, Ministry of Information and Broadcasting, Government of India.
3. NCERT (2006). Position Paper by National Focus Group on Arts, Music, Dance and Theatre
4. Theory of Drama by A. Nicoll

Web Resources

Position Paper National Focus Group on Arts, Music & Dance, NCERT
http://www.ncert.nic.in/new_ncert/ncert/rightside/links/pdf/focus_group/art_education.pdf
Arts in school education, (2012), http://azimpremjifoundation.org/pdf/LCXVIII.pdf
Online courses on Arts, http://www.dsource.in/course/index.php
Learning Indicators and Learning Outcomes at the Elementary Stage, (2014), NCERT
http://www.ncert.nic.in/departments/nie/dee/publication/pdf/LI_Final_Copy_Revised_29.12.14.pdf

BAE IV.7 : School Attachment Programme 2

Credits : 2 **Marks: 100**
Duration : 30 weeks **C1 + C2:50**
C3: 50

Objectives

- To familiarize student teachers with classroom processes and skills employed in teaching-learning process
- To provide field experience of assessment practices including record maintenance and report cards followed in schools at elementary and secondary levels.

COURSE CONTENT:

1. The student teachers will observe minimum 3 classes of regular teachers for understanding the skills and strategies used in teaching by them.
2. The student teachers will take two classes in each pedagogy by integrating various skills of teaching.

3. The student teachers will observe the integrated skills of teaching given by their peers and submit the observation records. (minimum 3 classes in each pedagogy).
4. The student teachers will visit schools and interact with teachers to know about the assessment practices like CCE, grading patterns and reporting the performance of students and submit the report
5. Students will analyse the assessment records and the report cards to study the modes of assessment and procedures followed in reporting students' performance. The students will attend the PTA meetings where feedback about students' performance is given by the teachers and submit the report.

FIFTH SEMESTER

Core Course 1 E : English Literature

BAE V.1 : LITERARY CRITICISM AND CRITICAL THEORY

Credits 4 (3L+1T+0P) **Max. Marks: 100**
Contact Hours per week: 5 **C1+ C2: 50**
Exam duration: 2 Hrs **C3: 50**

Objectives:

- This paper explores the theoretical deployment of the category of gender. Covers the basic histories of feminism as a historical force.
- Introduces the general scope of feminist studies as an interdisciplinary intellectual project in the academy.
- Questions notions of natural difference in order to explore how such notions are implicated in epistemologies, histories, broader cultural practices and relations of power.
- Offers an explanation of how the category of gender has come to define the human subject.
- Redefining the male dominated lyric tradition; Sexual politics in the construction of the self in modernist women's writing; The confessional mode in women's writing.
- Social reform movements and their impact on gender relations in India;
- The correlation between Aesthetics and Activism in women's writing

COURSE CONTENT:

Unit I: Western Feminist Thought:

Mary Wollstonecraft: Chapter One: "The Rights and Involved Duties of Mankind Considered". Vindication of the Rights of Women. (Pages 15-32)
Simone de Beauvoir, 'Introduction' in the The Second Sex in New French Feminisms. Eds. Elaine Marks and Isabelle de Courtivron (New York : Schocken Books, 1981), pp. 41-56.
Betty Friedan : "Introduction". The Feminine Mystique. (Pages 1-15)
Mary Wollstonecraft : Chapter One: "The Rights and Involved Duties of Mankind Considered". Vindication of the Rights of Women. (Pages 15-32)
Simone de Beauvoir : Part III: "Myths". The Second Sex. (Pages 171-229)
Betty Friedan : "Introduction". The Feminine Mystique. (Pages 1-15)
Sandra Gilbert and Susan Gubar, Chapter 2: 'The Infected Sentence : Women's Authorship and the Anxiety of Influence' from The Madwoman in the Attic (Yale Univ. Press, 1979), pp. 45-92.
Sigmund Freud, 'Female Sexuality', in The Collected Works of Sigmund Treud, vol. 5 (London : Hogarth Press, 1957), pp. 252-272.

Unit II: Indian Feminist Thought

Uma Chakravarti : "Whatever Happened to the Vedic Dasi?" Recasting Women: Essays in History. Ed. Kumkum Sangari and Sudesh Vaid (Pages 27-87)
Colonial History. Ed. Kumkum Sangari and Sudesh Vaid (Pages 27-87)
Tanika Sarkar : "Nationalist Iconography: The Image of Women in Nineteenth Century

Bengali Literature."Hindu Wife, Hindu Nation: Community, Religion and Cultural Nationalism (Pages 250-267)
Meenakshi Thapan : "The Body in the Mirror: Embodiment, Violence and Identity". Living the Body: Embodiment, Womanhood and Identity in Contemporary India. (Pages 93-130)

Unit III: Creative Literature-1

1. Kamala Das: My grandmother's House, The Looking Glass
2. Sylvia Plath: Mirror, Tulips.
3. Alice Walker : The Colour Purple
4. Maya Angelou: Pheonomenal Woman, Caged Bird
5. Adrienne Rich : Living in Sin
6. Virginia Woolf. Chapter 1 and selections from Chapter 3 of A Room of One's Own (New York : Harvest HGJ, 1957), pp. 3-24 and 48-59.

Unit IV: Divergent Perspectives

1. Sandra Gilbert and Susan Gubar, Chapter 2: 'The Infected Sentence : Women's Authorship and the Anxiety of Influence' from The Madwoman in the Attic (Yale Univ. Press, 1979), pp. 45-92.
2. Cora Caplan 'Women and Language', in Deborah Cameron, ed., Feminist Linguistics, A Reader :
3. Sigmund Freud, 'Female Sexuality', in The Collected Works of Sigmund Treud, vol. 5 (London : Hogarth Press, 1957), pp. 252-272.
4. Michael Foucault: A History of Sexuality Vol 1,2, 3

References :

1. Ann Brooks: Post Feminisms, Culture, Theory and Cultural Forms
2. Rosemary Tong : Feminist Thought
3. Sarah Gamble (Ed.) : The Routledge Companion to Feminism
4. Linda Nicholson : The Second Wave: A Reader in Feminist Theory
5. Alice S. Rosi (Ed.) :The Feminist Papers From Adams to de Beauvoir
6. Gayatri Chakravorty Spivak : In Other Words: Essays in Culture and Politics
7. Mary Russo: The Female Grotesque

Core Course 2 E :History

BAE V.2 : HISTORIOGRAPHY

Credits: 4 (3L+1T+0P) **Max. Marks: 100**
Contact Hours per week: 5 **C1 +C2: 50**
Exam duration: 2 Hrs **C3: 50**

Objectives

On completion of the paper the students will be able to:

- analyze the meaning, definitions of history and historiography
- appraise social revolutions in the world
- analyze different historiographical considerations

Unit I: Historiography

(A) Meaning of history, importance, definitions, Is History a science or art, relationship with other social sciences, historiography- Historical Facts-Problems of historical Evidence-Critical approaches to Sources-Narrative and arguments in History-Distinction between perspectives and bias- Causation and generalizations in History-Sources and Criticism-Historical Approaches-Historical materialism.

(B) Scientific and social revolutions

Scientific revolutions- Contributions of Copernicus and Bacon-Newton's laws of Nature-Industrial Revolution - Factory system and the guild system of Production-Changes in the means and relations of production- Case study of French revolution.

Unit II: Historiography of ancient India

Oriental Despotism -Asiatic Society-Nationalist and Marxist approaches

Unit III: Historiographical considerations of medieval India

Orientalism and the concept of Asiatic Society-Nationalist and Marxist approaches

Unit IV: Indian historical writings of Modern India

Nationalist school of thought and Dadabhai Nauroji-RC Dutt- Modern Writers: Tarachand and R.C. Majumdar- Nationalist, Marxist Feminist, Dalit, Subalterns and Post-modern approaches

References:

1. Sheik Ali, B., *History – Its Theory and Method***,** Mac Milan India Ltd, Delhi, 1995
2. Arthur Marwick, *Nature of History***,** London, 1990
3. Barnes, H.E., *History of Historical Writing*, New York, 1963
4. Carr, E.H., *What is History?*
5. Momigliano, A., *Essays in Ancient and Modern Historiography,* Oxford
6. Perry Anderson, *In the Tracks of Historical Materialism,* London, 1983
7. Peter Burke (Ed.), *New Perspectives on Historical Writing***,** Polity Press, 1977
8. Sreedharan, *Historiography*, Orient Longman
9. Satish K Bajaj, *Recent Trends in Historiography*, Anmol Pvt. Ltd., New Delhi
10. Venugopal T R, *History and Theory, National Seminar Papers,* Department of History, Govt. College, Trissur, 1997.
11. Hobsbawm Eric, *On History*, Weidenfeld and Nicolson, London, 1997.

Core Course 3 E : Geography

VBAE V.3A : REGIONAL GEOGRAPHY OF ASIA AND EUROPE

Credits 4 (3L+0T+1P) **Max. Marks: 100**
Contact Hours per week: 5 **C1+ C2: 50**
Exam duration: 2 Hrs **C3: 50**

Objectives:
The objectives of this course are to give an overview of the land, people and economy of the different countries of the world, so that the students are aware of their neighbors as well as other countries located in distant realms. In this process, the students would be abreast of the diverse geographical processes,in the ambits of which economic development of various countries of the world have evolved.

COURSE CONTENT:

Unit I: Physical Asia
Physiographical Divisions of Asia. Major River Systems. Climate. Natural Vegetation. Asia in the context of the world. Terrain pattern, Drainage. Classification and Distribution of Climate, Natural Vegetation, and Soils,

Unit II: Population and Economy of Asia
Growth and Spatial Distribution of Population in Asia. Distribution and Production of Major Crops: Rice, Wheat, Sugar Cane, Cotton, Tea and Rubber. Major Industries in Asia: Iron and Steel, Textile and Sugar. Major Industrial Regions of Asia.

Unit III: Physical Europe
Physiographical Divisions of Europe. Major River Systems. Climate. Natural Vegetation. Europe in the context of the world. Terrain pattern, Drainage. Classification and Distribution of Climate, Natural Vegetation, and Soils.

Unit IV: Population and Economy of Europe
Growth and Spatial Distribution of Population in Europe. Distribution and Production of Major Crops: Wheat, Cotton and Dairy Farming in European Countries. Major Industries in Europe: Iron and Steel, Textile and Petroliam Refineries. Major Industrial Regions of Europe.

References:

1. Cole, J.: A Geography of the World's Major Regions, Routledge, London,1996.
2. DeBlij, H.J.: Geography: Regions and Concepts, John Wiley, New York,1994.
4. Dickenson,J.P.et al. The Geography of the Third World. Routledge, London, 1996.
5. Gourou, P.: The Tropical World, Longman, London, 1980.
6. Jackson,R.H.and Hudman,L.E.: World Regional Geography: Issues for Today. John Wiley, New York,1991.
7. Kolb, A.: East Asia -Geography of a Cultural Region. Mathuen, London,1977.
8. Minshull, G.N.: Western Europe, Hoddard & Stoughton, New York, 1984.
10. Songquiao,Z.: Geography of China. John Wiley, New York, 1994.
11. Ward,P.W.and Miller,A.:World Regional Geography: A Question of Place. John Wiley, New York,1989.

PRACTICALS

Exam Duration: 3hrs **C_3: 50**

COURSE CONTENT:

Data Collection and Representation

Geographical Data Management: Collection (Sampling Techniques- Significance and Types), Classification, Tabulation, Interpretation and Analysis of Geographical Data. Frequency Distribution: Attribute and Variable, Discrete and Continuous.

Graphical Representation of statistical Data

Graphical Representation of Frequency Distribution (Histogram, Frequency Polygon, Curve, cumulative frequency curve and Ogives).

Measurement of Central Tendency and Dispersion

Measures of Central Tendencies: Mean, Median and Mode; Skewness. Measures of Dispersion: Range, quartiles and percentiles, Mean Deviation, Standard Deviation, Co-efficient of variation.

Application

Application of mean, median, quartile and standard deviation in mapping of population, agriculture and industrial data.

References:

1. Singh, R.L., Elements of Practical Geography, Kalyani Publishers, New Delhi, 1979.
2. Gopal Singh, Map Work and Practical Geography, III Edition, Vikas Publishing House, New Delhi.
3. Mishra R, P., Fundamentals of Cartography, 1969, Prasaranga, University of Press, Mysore.
4. Zamir Alvi, Statistical Geography, Methods and Applications, Rawat Publications, Jaipur, 1995.

Core Course 3 E : Political Science

BAE V.3B: INDIAN GOVERNMENT AND POLITICS

Credits 4 (3L+1T+0P) **Max. Marks: 100**
Contact Hours per week: 5 **C1+ C2: 50**
Exam duration: 2 Hrs **C3: 50**

Objectives: After completing the course the student teachers will be able to understand and comprehend:

- the basic philosophy, structure and salient features of Indian Constitution
- the working of the Federal System in India
- the role and important functions of the Government Machinery
- and the different roles and functions of the Party system in India

COURSR CONTENT

Unit I: Indian Constitution
Philosophy, Basic Structure of Indian Constitution, Salient features of Indian Constitution, Fundamental rights and Duties, Directive principles of State policy, Judicial Independence and Judicial Activism

Unit II: Federal System in India
Centre state relations, Autonomous demands, main recommendations of Sarkaria Commission and electoral reforms in India

Unit III: Government Machinery
Power and position of the President, Prime Minister and the cabinet, Power and positions of Governor and Chief minister, Parliament and state legislature, law making process and reasons for the decline of Legislature

Unit IV: Party System in India
National and regional Parties, Pressure groups, their role in Indian Politics

References

1. Austin, Granville, *Working of a Democratic Constitution*, The Indian Experience, Oxford Publications, New Delhi, 2000
2. Basu, D.D., *An Introduction to the Constitution of India*, Prentice Hall, New Delhi, 1994
3. Chandra, Ashok, *Federalism in India: A Study of Union-State Relations*, George Allen and Unwin, London, 1965
4. Johari, J.C., *Indian Government and Politics,* Vikas Publications, New Delhi, 2001
5. Pylee, M.V., *Constitutional Government in India,* S. Chand and Co., New Delhi, 1984.

PROFESSIONAL EDUCATION COURSES

BAE V.4 : ASSESSMENT FOR LEARNING

Credits: 4 (3L+ 1T +0P) **Marks: 100**
Contact hrs per week: 5 **C1 + C2: 50**
Exam Duration: 2 hrs **C3: 50**

Objectives:
This course is designed to help student teachers to

- Understand the nature of assessment and evaluation and their role in teaching- learning process.
- Understand the importance of assessment in continuous and comprehensive manner
- Plan assessment tasks, techniques, strategies and tools to assess learner's competence and performance in curricular and co-curricular areas,
- Devise marking, scoring and grading procedures,
- Analyse, manage and interpret assessment data.
- Devise ways of reporting on student performance
- Develop the skills of reflecting-on and self-critiquing to improve performance.

COURSE CONTENT:

Unit I: Introduction to Assessment & Evaluation

(a) Concept of test, measurement, Assessment, examination, appraisal and evaluation in education and their inter relationships.
(b) Purpose and objectives of assessment/ Evaluation- for placement, providing feedbacks, grading promotion, certification, diagnostic of learning difficulties.
(c) Importance of assessment & evaluation for Quality Education – as a tool in Pedagogic decision making (writing instructional objectives, selection of content, teaching learning resources, methodology, strategies & assessment procedures followed).
(d) Forms of assessment : -
  (i) (Formative, Summative, diagnostic; prognostic, placement; Norm referenced; Criterion referenced based on purpose)
  (ii) (Teacher made tests Standardized tests: based on nature & scope)
  (iii) (Oral, written, performance: based on mode of response)
  (iv) (Internal, External, self, peer, & teacher, group Vs individual- based on context)
  (v) Based on nature of information gathered (Quantitative, Qualitative)
  (vi) CCE, school based assessment ; Standard Based- based on Approach
(e) Recent trends in assessment and evaluations:
  - Assessment for learning, assessment of learning and assessment as learning; Relationship with formative and summative, Authentic assessment.
  - Achievement surveys- State, National and International; Online assessment; On demand assessment/ evaluation.
  - Focus on Assessment and Evaluation in Various Educational commissions and NCFs

Unit II: Developing Assessment Tools, Techniques and Strategies -1

(a) Concept of Cognitive, Affective, Psychomotor domain of learning
(b) Relationship between educational objectives learning experiences and evaluation.
(c) Revised taxonomy of objectives (2001) and its implications for assessment and stating the objectives-
  - Knowledge dimensions:- factual, conceptual, procedural and meta-cognition.
  - Cognitive, Affective, Psychomotor domains – Classification of objectives
(d) Stating objectives as learning out comes: General, Specific.

(f) Construction of achievement tests- steps, procedure and uses (Teacher made test/Unit Tests)
- Constructing table of specifications & writing different forms of questions –(VSA, SA, ET & objective type, situation based) with their merits and demerits; assembling the test, preparing instructions, scoring key and marking scheme; and question wise analysis

(g) Construction of diagnostic test – Steps, uses & limitation; Remedial measures- need types and strategies

(h) Quality assurance in tools – Reliability: Meaning &Different methods of estimating reliability (Test-retest; equivalent forms, split- half); Validity: Meaning &Different methods of estimating reliability (Face, content, construct), Objectivity and Practicability/ Usability

(i) Inter dependence of validity, reliability and objectivity

Unit III: Developing Assessment Tools, Techniques and Strategies -II

(a) Concept of CCE, need for CCE its importance; relationship with formative assessment and problems reported by teachers and students

(b) Meaning & construction of process-oriented tools- Interview; Inventory; observation schedule; check-list; rating scale; anecdotal record;

(c) Assessment of group processes-Nature of group dynamics; Socio-metric techniques; steps for formation of groups, criteria for assessing tasks; Criteria's for assessment of social skills in collaborative or cooperative learning situations.

(d) Promoting Self-assessment and Peer assessment – concepts and criteria's

(e) Portfolio assessment – meaning, scope & uses; developing & assessing portfolio; development of Rubrics

Unit IV: Analysis, Interpretation, Reporting and Communicating of student's performance

a) Interpreting student's performance
   (i) Descriptive statistics (measures of central tendency & measures of variability, percentages, rank correlation)
   (ii) Graphical representation (Histogram, Frequency Curves)

(b) Grading – Meaning, types, and its uses

(c) Norms – Meaning, types, and its uses

(d) Reporting student's performance – Progress reports, cumulative records, profiles and their uses, Portfolios, Using descriptive Indicators in report cards

(e) Role of feedback to stake holders (Students, Parents, Teachers) and to improve teaching – learning process; Identifying the strengths & weakness of learners.

Sessional Work:

1. Discussion on existing assessment practices in schools and submitting the report.
2. Constructing a table of specification on a specific topic (subject specific)
3. Constructing a unit test using table of specifications and administering it to target group and interpreting the result.
4. Construction of any one of the process oriented tools and administering it to group of students & interpreting it.
5. Analysis of question papers: teacher made and various Boards
6. Analysis of report cards-State and Central (CBSE)
7. Analysis of various education commission reports and NCFs for knowing various recommendations on Assessment and Evaluation

References:

1. Ebel, R.L. and Fresbie, D.A. (2009).Essentials of Educational Measurement. New Delhi: PHI Learning PVT. LTD.
2. Garrett, H.E. (2008). Statistics in Psychology and Education. Delhi: Surjeet Publication.
3. Gupta, S.K. (1994). Applied Statistics for Education. Mittal Publications.
4. Mehta, S.J. & Shah, I.K. (1982).Educational Evaluation. Ahmedabad: Anand Prakashan (Gujarati).
5. NCERT (2015) Learning Indicator, New Delhi
6. NCERT (2015) CCE Packages, New Delhi
7. Rani, P. (2004).Educational Measurement and Evaluation. New Delhi: Discovery Publishers.
8. Rawat, D.S. (1970). Measurement, Evaluation and Statistics in Education. New Delhi: New Raj Book Depot.
9. Reynolds, C.R., Livingston, R.B., and Willson, V. (2011).Measurement and Assessment in Education. New Delhi: PHI Learning PVT. LTD.
10. Ten Brink, T.D. (1974). Evaluation – A Practical Guide for Teachers. New York: McGraw Hill Book Co.
11. Thorndike, R.M. (2010). Measurement and Evaluation in Psychology and Education. New Delhi: PHI Learning Pvt. Ltd.
12. Yadav, M.S. and Govinda, R. (1977). Educational Evaluation, Ahmedabad: Sahitya Mudranalaya.
13. Linn, Robert and Norman E Gronland (2000); Measurement and Assessment in teaching, 8th edition, by Prentice Hall, Inc, Pearson Education, Printed in USA
14. Ved Prakash, et.al. (2000): Grading in schools, NCERT, Published at the publication Division by the secretary, NCERT, Sri Aurobindo Marg, New Delhi
15. Tierney, R. J., Carter, M. A., & Desai, L. E. (1991). Portfolio Assessment in the Reading – Writing Classroom. Norwood, MA: Christopher-Gordon Publishers
16. Glatthorn, A. A. (1998). Performance Assessment and Standards-based Curricula: the Achievement Cycle. Larchmont, NY: Eye no Education
17. Gredler, M. E. (1999). Classroom Assessment and Learning. USA: Longman.
18. Likert, R. (1932). A technique for the Measurement of Attitudes. Archives Psychology, 40.
19. Mehrens, W. A. & Lehmann, I. J. (1991). Measurement and Evaluation in Education and Psychology (8th ed.): Chapter 10: Describing Educational Data.
20. Oosterhof, A. (1994). Classroom Applications of Educational Measurement (Second Edition). New York: Macmillan College Publishing Company Inc.
21. Popham, W. J. (2002). Classroom Assessment: What teachers need to know (Third Edition). Boston: Allyn& Bacon.

Web Resources

1. Assessment in school education, (2013)

http://azimpremjifoundation.org/sites/default/files/userfiles/files/Issue%20XX%20Section%20C.pdf
2. Compendium of Tools, (2013), CBSE

http://cbse.nic.in/ePub/webcbse/webcbse/Revised%20Compendium%20of%20Tools/Revised%
20Compendium%20of%20Tools/docs/Revised%20Compendium%20of%20Tools.pdf
3. http://www.cbse.nic.ib/cce/index.html
4. www.ncert.nic.in
5. http://nroer.in/home/

BAE V.5 : Pedagogy of English

Credits: 4 (2L+ 2T +0P) **Marks: 100**
Contact hrs per week: 6 **C1 + C2: 50**
Exam Duration: 2 hrs **C3: 50**

Objectives :
Student teachers
- understand the status and functions of English in India.
- understand the principles underlying the learning of English language.
- develop an insight into the language learners and the learning process
- critically evaluate the new school English curriculum.
- understand the importance of various instructional aids.
- analyse and fourfold language skills and their interrelationship.
- become familiar with the different types of vocabulary and structural items.

COURSE CONTENT:
Unit I: General Introduction on Language
Understanding and defining Language; various components of language; Functions of language; Signature characteristics of Languages; Understanding the following concepts Dialect, Standard and Non-standard language, classical ;Characterizing mother tongue, first language, and second language, bilingual and multilinguals.
Minority languages and Heritage languages, Code mixing and code switching- their application in classroom. Introducing the four major skills and subskills- Teaching oral communication- listening and speaking skills in the classroom-collaborative learning activities and demonstrations of approaches to teaching oral communication- developing, evaluating and adapting tasks and resources.

Unit II: Language Acquisition
Language learning in early childhood; Language and Cognition: Piaget, Vygotsky and Chomsky on language acquisition and relevance of their views for the language teacher;
Second language acquisition
Theories of Noam Chomsky and Ken Goodman.
A general understanding of the traditional approaches including grammar-translation method, audio-lingual method, bilingual method and communicative approach
Teaching and assessing reading skills in the classroom – investigate varied teaching strategies for meeting learner's diverse abilities and needs-guidance for developing, evaluating and adapting reading tasks and resources.

Unit III: Language and Literacy in the Context of School

Language environment of school and the varied nature of Indian classrooms; Language Learner's profile: language environment at home; Characterizing bilingualism and multilingualism; Home language, notions of dialects and colloquialism, literary inventions and idioms.
Understanding notions concerning "right" and "Wrong" use of language; acknowledging the worth of "errors" in language learning.
Student teachers will develop an understanding of the role of grammar in syllabus text types and current textbooks- practice designing appropriate grammar teaching and assessment strategies within other context of teaching other language skills- presentations and demonstration of approaches to grammar teaching- guidance for developing evaluating and adapting grammar teaching tasks and resources.

Unit IV : Multimedia and Communications Technology
CALL- Computer Assisted Language Learning
Audio visual aids –importance and their limitations
Pictures, Audio CDs, realia, flashcards, flip charts, language lab, models, video clipping, films, documentaries, cartoons, advertisements, newspaper cutting , various IT resources, etc.
Develop an understanding of theoretical approaches to teaching and assessing writing, and explore different strategies for integrating classroom writing with other language skills and subjects-collaborative and reflective activities that provide guidance in developing and adapting textual and media resources for writing syllabus.

Sessional Work:
* Students undertake a study of the linguistic cultures prevailing in the society
* Make a case study of use of home language and second language
* Assess the influence of IT resources on language learning and teaching.

References:
National Curriculum Framework, 2005, NCERT
Position Paper on English, NCERT
1. Agnihotri, R. K. and Khanna, A. L. (1994). / Second language acquisition: Sociocultural and linguistic aspects of English in India./ New Delhi : Sage Publications.
2. Allen and Cambell (Ed.). (1969). / Teaching English as a second language./ New Delhi : Tata McGraw Hill. Book Co.
3. Allen, H. B.(1965)./ Teaching English as a second language : Book of readings / Bombay:
   McGraw Hill.
4. Broughton, Geoffery et al. (1978)./ Teaching English as a second language./ London : Routledge and Kegan Paul.
5. Carrel, P. L., Devine , J. & Eskey, D. E. (1988)./ Interactive approaches to second language reading./ Cambridge : Cambridge University Press.
6. Chaturvedi, M. G. & Mohale, B. V. (1976)./ Positions of language in School Curriculum in India./ New Delhi : NCERT.
7. Chaudron, Craig, (1988)./ Second language classrooms./ Cambridge: Cambridge University Press.
8. Cook, Vivian. (1991)./ Second language learning and language teaching./ New York: Chapman and Hall Inc.
9. Crystal, David. (Ed.). (1997)./ Cambridge encyclopedia of second language education./ United Kingdom: Cambridge University Press.
10. Cummins, J. (1984)./ Bilingualism and special education : Issues in assessment and pedagogy./ Claredon. UK: Multilingual matters.
11. Di Pierto, R.J. (1987)./ Strategic interaction : Learning language through scenarios./ Cambridge: Cambridge University Press. Vv
12. Dubin, F. and Olshtain, E. (1986)./ Course design- developing programs and materials for language learning./Cambridge, Cambridge University Press.

13. Ebel, R. L. and Frisbie. D. A. (1991)./ Essentials of educational measurement./ New Delhi: Prentice Hall of India Pvt. Ltd.
14. Eggen, P. D. and Kauchak, D. P. (1990). Strategies for teachers: Teaching content and thinking skills./ New Jersey: Prentice Hall.
15. Ellis, Rod. (1987)./ Understanding second language acquisition./ Oxford: Oxford University Press.
16. Underhill, Nic. (1987)./ Testing spoken language. A handbook of oral testing techniques.
Cambridge : Cambridge University Press

BAE V.6 : PEDAGOGY OF SOCIAL SCIENCE

Credits: 4 (2L+ 2T +0P) **Marks: 100**
Contact hrs per week: 6 **C1 + C2: 50**
Exam Duration: 2 hrs **C3: 50**

Objectives: To enable the prospective teachers:

- To develop an insight into the emergence of social sciences as a discipline, nature of knowledge and process of inquiry in social sciences, and contributions made by Indian social scientists.
- To comprehend the place of social sciences in school curriculum as well as the conceptual and pedagogical shift occurred in the field.
- To analysis the policy documents on education and bring out perspectives, aims and objectives of social science curriculum in India.
- To critically appraise the existing social science curriculum at the national and state level in the light of the approaches and principle of curriculum design and organization.
- To evaluate the social science textbooks based on laid down criteria.
- To prepare effective plans for teaching social sciences at secondary level including Unit and Lesson Plans.

COURSE CONTENTS:

Unit I: Nature and Place of Social Sciences in School Curriculum

Overview of foundations of social science disciplines: history, political science, geography and economics.

Nature of knowledge and process of inquiry in social sciences; Specialized knowledge versus Inter-disciplinary knowledge.

Concept of social science and social studies; Evolution of social science curriculum as reflected in education policies of India.

Social science as a core subject in school curriculum; Paradigm shift in school social sciences: conceptual and pedagogical.

Aims and objectives of learning social sciences; Emphasis in teaching: integrated versus disciplinary.

Unit II: Social Science Curriculum and School Textbooks

Approaches and challenges in designing social science curriculum: child centered, society centered, subject centered, eclectic, and constructivist.

Organization of content: Thematic, Spiral, Interdisciplinary; Horizontal and Vertical linkage; Linkage between upper primary and secondary curriculum.

Selection of content from different social science disciplines and their weightages and interrelationship; Content load, scientific rigour, and normative concerns.

Textbook content and classroom discourse; scope for multiple reading and meaning; Political and ideological underpinning; Representation of dominant views.

Critical review of social science textbooks from diverse curricular and pedagogical perspectives in the light of the core elements suggested in National Policy on Education (1986) and other policy documents.

Unit III: Pedagogical Practices in Social Sciences

Principles of effective pedagogy in social sciences; Facilitating leaning in social science: Create multiple, meaningful and participatory learning contexts; Promoting questioning abilities; Providing opportunities for collaborative learning.

Effective scaffolding of student's learning; Developing critical perspectives-historical, environmental, economic and constitutional.

Pedagogical analysis in social sciences: Analysis of textbook content; Identification of themes, key concepts and issues; Formulating instructional objectives; Selection of appropriate methods, materials and strategies of teaching learning; Deciding evaluation devices and techniques.

Development of Unit Plan: Thematic mapping of curricular content of a unit; Identification of learning indicators in social sciences at secondary level; Preparation of Unit plan.

Unit IV: Planning for Teaching Social Sciences

Understanding importance of planning in teaching: Analyzing relevant materials including videos on instructional planning; Critical review of videos on teaching social sciences; Observation of classroom practices of social science teachers and reflect upon planning and implementation of teaching in social sciences.

Approaches to lesson planning in social sciences: Herbartian approach, Bloom's evaluation approach, Constructivist approach, 5Es lesson plan model in social sciences.

Using Taxonomy of Instructional Objectives as a tool for setting learning objectives; Writing learning objectives—behavioral and non-behavioral—based on selected chapters from social science textbooks.

Designing and sequencing of learning activities; Preparation of social sciences teaching lessons for high school classes.

Practicum:

1. Critical analysis of educational policies, curriculum frameworks and other relevant documents to bring out the evolution of social science curriculum in India.
2. Critical appraisal of existing social science curriculum and textbook at school level.
3. Analysis of social science textbook content of classes IX and X and preparation of four unit plans, one each in History, Political science, Geography and Economics.
4. Student teachers write at least four lesson plans, one each in history, geography, economics and political science based on the units in the textbooks of classes IX and X, and present and discuss in groups under the mentorship of faculty members.
5. Review of National Policies on Education and Curriculum Frameworks to bring out the perspectives, aims and objectives of social science curriculum in India.
6. Critical appraisal of national and state social science curricula and compare with standard based curricula of selected countries.
7. Critical analysis of existing social science textbooks of classes VI to X.

References:

1. Allen, J and Landaker, C. (2004). Reading history: Strategies to improve comprehensions and connections in social studies classes. New York: Oxford University Press.
2. Arora, P. (2014). Exploring the Science of Society. Journal of Indian Education, NCERT.
3. Batra, P. (2010). Social science learning in schools: Perspectives and challenges. New Delhi: Sage publications India.
4. Binning, A. A. and Binning, D. H. (1952). Teaching of social studies in secondary schools. Bombay: Tata McGraw Hill.

5. Burz, H. L. and Marshall, K. (1998).Performance based curriculum for social studies: From knowing to showing. Thousand Oaks: Corwin Press, INC.
6. Crotty, M. (1998). The foundation of social research: Meaning and perspectives in the research process. London: Sage Publications.
7. Dhamija, N. (1993). Multimedia approaches in teaching social studies. New Delhi: Harman Publishing House.
8. Farris, P. J.(2001). Elementary and middle education social studies: An interdisciplinary instructional approach. New York: McGraw Hill.
9. George, A. M and Madan, A. (2009). Teaching social science in schools. New Delhi: Sage Publications India.
10. National Curriculum Frameworks 1975, 1988, 2000 and 2005.
11. Root, M. (1993). Philosophy of Social Sciences. Oxford: Blackwell.
12. Sartori, G. (Ed.) (1984). Social concepts: A systematic analysis. New Delhi: Sage Publications.
13. Siddiqui M. H. Teaching of economics. APH Publications Corporation.
14. Sanford, M. (1986). The nature of historical knowledge. Oxford. Blackwell.
15. Teachers Curriculum Institute. (2010). Bring Learning Alive: Methods to Transform Middle and High School Social Studies Instruction. [www.teachtci.com]
16. Trigg, R. (1985). Understanding social science: A philosophical introduction to social sciences. Oxford: Blackwell.
17. Wilkins, E. J. (1979). Elements of social sciences. London: McDonald and Evans.

SIXTH SEMESTER

Core Course 1 F : English Literature

BAE VI.1 : AMERICAN LITERATURE

Credits 4 (3L+1T+0P) **Max. Marks: 100**
Contact Hours per week: 5 **C1+ C2: 50**
Exam duration: 2 Hrs **C3: 50**

Objectives:

- To offer the student teachers perspectives into separate identity and individualizing themes that establish the intrinsic character of the American lives and their myriad reflections in literature.
- To help the student teachers to make an in-depth study of the factors that contributes to make the American English and American literature an entirely different experience in stark contrast to its more aristocratic counterparts of British Literature and King's English.
- To offer insights for the student teachers about the sociological and historical factors of the American reality that inspires its literature.
- To facilitate the student teachers understand the different contours of the American theatre.
- To help student teachers derive an insight into early Afro-American writing.

COURSE CONTENT :

Unit I : Poetry

Robert Frost : Mending Wall
Walt Whitman : When Lilacs Last in the Dooryard Bloomed, A Noiseless Patient Spider.
Emily Dickinson : I heard a fly buzz when I died, Because I could not stop for Death
Sylvia Plath : Mirror, Tulips.

Unit II: Fiction

Ernest Hemingway : The Old man and the Sea
Tony Morrison : The Bluest Eyes

Unit III: Prose

Emerson : The American Scholar, Self Reliance

Unit IV : Drama

Arthur Miller : Death of a Salesman

References:

1. Storve - Uncle Tom's Cabin, Penguin Classics, New York, 1965
2. M Twain - Huckleberry Finn, Penguin Classics, New York, 1969
3. Henry James - The Bostonians, Penguin Classics, New York, 1976
4. Salinger - Catcher in the Rye, Routeledge, New Hampshire , 1980
5. Albee - The Zoo Story, South Illinois University, 2003
6. Dubois : Afro-American Slave Narratives, OUP, 2001
7. American Drama : Oxford Companion Series, 2002
8. American Poetry. : Oxford Companion Series, 2002

Core Course 2 F : History

BAE VI.2 : MAKING OF MODERN WORLD

Credits 4 (3L+1T+0P) **Max. Marks: 100**
Contact Hours per week: 5 **C1+ C2: 50**
Exam duration: 2 Hrs **C3: 50**

Objectives:

After completion of the course, the student teachers will be able to understand various issues with regard to transition from feudalism to capitalism, reformation in the Sixteenth Century Europe, The English Revolution and enlightenment and Philosophical developments.

COURSE CONTENT:

Unit 1:Transition from feudalism to capitalism – Various Issues

Early colonial empires; Motives; Geographical explorations; Slave trade; Colonization in South America; Renaissance; Humanism in thought and arts

Unit II: Reformation in sixteenth century Europe

Rise of Protestant religion and its impact; Economy of Europe (16-17th centuries): Commercial revolution; Scientific Revolution

Unit III: The English revolution

Political and intellectual currents; Mercantilism in Europe; Transition to parliamentary system and ideas of representation

Unit IV: Enlightenment and Philosophy

American and French revolution; Beginning of Industrial economy; Factory system and steam power; Rise of modern industries, social classes and means of communication (railways and telegraphs

References :

1. E.J. Hobsbawm, The Age of Extremes, 1914 – 1991, New York: Vintage, 1996_Carter V.
2. Findley and John Rothay, Twentieth-Century World,. Boston: Houghton-Mifflin, 5th ed. _2003_Norman Lowe, Mastering
3. Modern World History, London: Palgrave Macmillan, 1997
4. Mark Mazower, The Balkans: A Short History [especially chap. 4], New York: Modern Library, 2000: paperback, 2002

5. Basil Davidson, Modern Africa: A Social and Political History, 3d edn. London / New Jersey: Addison – Wesley, 1995
6. I, Rigoberta Menchu, An India Woman in Guatemala [Memoir of 1992 Nobel Peace Prize Winner, London: Verso.1987 {Hindi translation available}
7. Jonathan Spence, The Gate of Heavenly Peace: The Chinese and Their Revolution, 1895 – 1980, Penguin, 1982
8. P S Gupta, Aadhunik Paschim Ka Uday, Delhi
9. J H Plumb, The Pelican Book of the Renaissance, Penguin, 1982
10. G. R. Elton, Reformation Europe 1517,1559, Wiley, 1999
11. Ralph Davis, The Rise of the Atlantic Economies, New York, 1973
12. Arvind Sinha, Europe in Transition, Delhi, 2010 (also in Hindi)
13. Rodney Hilton, The Transition from Feudalism to Capitalism, Delhi, 2006.
14. Fernand Braudel, Civilization and Capitalism, Vols. I, II, III, California, 1992
15. Butterfield, Herbert. The origins of modern science.Vol. 90507. Free Press, 1997

Core Course 3 F : Geography

BAE VI.3A : REGIONAL GEOGRAPHY OF AMERICA, AUSTRALIA AND NEW ZEALAND

Credits 4 (3L+0T+1P) **Max. Marks: 100**
Contact Hours per week: 5 **C1+ C2: 50**
Exam duration: 2 Hrs **C3: 50**

Objectives:
The objectives of this course are to give an overview of the land, people and economy of the different countries of the world so that the students are aware of their neighbors as well as other countries located in distant realms. In this process, the students would be abreast of the diverse geographical processes, in the ambits of which economic development of various countries of the world have evolved.

COURSE CONTENT:

Unit I: Physical North America
Physiographical Divisions of North America. Major River Systems. Climate and factors influencing climate of North America. Natural Vegetation. North America in the context of the world. Terrain pattern, Drainage. Classification and Distribution of Climate, Natural Vegetation, and Soils,

Unit II: Population and Economy of North America
Growth and Spatial Distribution of Population in North America. Distribution and Production of Major Crops: Wheat, Cotton, Corn Belts of North America. Major Industries in North America: Iron and Steel, Aluminum, Automobile and Petroleum Refineries. Major Industrial Regions of Asia.

Unit III: Physical Australia and New Zealand
Physiographical Divisions of Australia and New Zealand. Major River Systems. Climate. Natural Vegetation. Australia and New Zealand in the context of the world. Terrain pattern, Drainage. Classification and Distribution of Climate, Natural Vegetation, and Soils,

Unit IV: Population and Economy Australia and New Zealand
Growth and Spatial Distribution of Population in Australia and New Zealand. Distribution and Production of Major Crops: Wheat, Cotton and Dairy Farming in Australia and New

Zealand. Major Industries in Australia and New Zealand: Iron and Steel, Woolen Textiles. Major Industrial Regions of Australia and New Zealand.

References:

1. Cole, J.: A Geography of the World's Major Regions, Routledge, London, 1996.
2. Cole, J.P.:Latin America-Economic and Social Geography, Butterworth USA, 1975.
3. DeBlij, H.J.: Geography: Regions and Concepts, John Wiley, New York, 1994.
4. Dickenson,J.P. et al.: The Geography of the Third World. Routledge, London, 1996.
5. Gourou, P.: The Tropical World, Longman, London, 1980.
6. Jackson,R.H.and Hudman,L.E.:World Regional Geography: Issues for Today. JohnWiley, New York,1991.
9. Patterson,J.H.: Geography of Canada and the United States.Oxford University Press 1985.
11. Ward,P.W.and Miller,A.:World Regional Geography: A Question o fPlace. John Wiley,New York,1989.

PRACTICALS

Exam Duration: 3hrs **C_3: 50**

COURSE CONTENT:

Photogrammetry and Image Interpretation

Aerial Photography:

History and development of aerial remote Sensing. Application of their techniques in Geography. Aerial photograph and its index marks

Photogrammetry

Stereo test; Orientation of stereopair under mirror stereoscope; Use of parallax bar and the determination of heights and slopes; Preparation of base map.

Interpretation of Aerial Photographs:

Chief elements of aerial photo interpretation: Size, shape, ton, texture, pattern and location association. Detection of defined objects; Use of auxiliary information in object identification; Preparation of image interpretation keys; Interpretation of stereo pair for physical and cultural features;

Interpretation of Satellite Imageries

Referencing and layout of satellite images; Identification of objects/features on multi-band imageries and FCC; Interpretation of physical and cultural features from IRS imagery.

References:

1. American Society of Photogrammetry, 1993, Manual of Remote Sensing, Falls Church, Virginia
2. Curran, Paul J., 1995, Principles of Remote Sensing, Longman, London
3. Joseph George (2003) Fundamentals of Remote Sensing, University Press, Hyderabad.
4. Lilles and T.M and Keifer R.W. (2000) Remote Sensing and Image Interpretation, IVth Eds. John Wiley and Sons, New York.
5. Lo C.P. & Yeung A.K.W., (2004). Concepts and Techniques of GIS, Prentice-Hall of India, New Delhi
6. J. R. Jenson (2000) Remote Sensing of Environment, Pearson Education, New Delhi
7. Muller, P.J., 1996, Digital Image Processing in Remote Sensing, Taylor & Francis, London.
8. Nag, P. & Kudrat M., 1996, Digital Remote Sensing, Concept Publishing Company, New Delhi.
9. Rashid, S.M. and MMA Khan, 1993, Dictionary of Remote Sensing, Manak Publication Pvt. Ltd, New Delhi
10. Sabins F. F. (2002), Remote Sensing: Principles and Interpretation, Freeman, New York
11. Sabins Floyd F, 1996, Remote Sensing: Principles and Interpretation, Freeman, New York
12. Wolf, Paul R., 1993, Elements of Photogrammetry, McGraw Hill, New York.

Core Course 3 F : Political Science

BAE VI.3B: INTERNATIONAL RELATIONS

Credits 4 (3L+1T+0P) **Max. Marks: 100**
Contact Hours per week: 5 **C1+ C2: 50**
Exam duration: 2 Hrs **C3: 50**

Objectives: after completing the course the student teachers will be able to understand and comprehend:

- meaning, nature and development of International relations as an academic discipline
- elements and limitations of power, formulation and promotion of national Interest
- wars, alliances, diplomacy, their causes and consequences
- regional organizations and their importance such as SAARC, ASEAN, OPEC, and OAE

COURSR CONTENT

Unit I: Internal Relations

Meaning, nature and development of International relations as an academic discipline, contending theories and approaches-science Vs tradition, realist and idealist approaches, systems, game, communication and decision making theories.

Unit II: Power and National Interest

Elements and limitations of power, balance of power, formulation and promotion of national Interest

Unit III: Wars, Alliances and Diplomacy
Wars, alliances and diplomacy, causes and types of wars, alliances, peaceful settlement of disputes, diplomacy-nature and types, efforts towards disarmament, Role of United Nations in Peace Keeping.

Unit IV: Regional Organisations
Regional organizations and their importance-SAARC, ASEAN, OPEC, and OAE

References

1. Holsti. K. J., *International Politics: A Framework for Analysis*, Prentice Hall, New Delhi, 1978.
2. Kumar, Mahendra, *Theoretical Aspects of International Politics*, Shivlal Agarwala & Company, Agra, 1976.
3. Malhotra, Vinay Kumar, *International Relations*, Anmol Publications, New Delhi, 2008.
4. Morgenthau, Hans J & Kenneth W Thompson, *Politics Among Nations – The Struggle for power and peace*, Kalyani Publishers, New Delhi, 2007.
5. Rumki Basu (Ed), *International Politics – Concepts, Theories and Issues*, Sage Publications, New Delhi, 2012.

PROFESSIONAL EDUCATION COURSES

BAE VI.4 : CRITICAL UNDERSTANDING OF ICT

Credits: 4 (3L+ 0T +1P) **Marks: 100**
Contact hrs per week: 5 **C1 + C2: 50**
Exam Duration: 2 hrs **C3: 50**

Objectives
On completion of the course the students will be able to:

- Appreciate the historical, current and future trends in ICT and its implications to education
- Explain the meaning of ICT and its application in Education
- Demonstrate an understanding of the computer hardware and software fundamentals
- Use various digital hardware and software for creating resources and providing learning experiences
- Use a word processor, spread sheet, drawing and presentation software skillfully and intelligently to produce various teaching learning resources for educational use
- Use internet technologies efficiently to access remote information, communicate and collaborate with others
- Model collaborative knowledge construction using various web 2.0 tools and technologies
- Design and develop technology integrated learning experiences using ICT tools
- Develop skills in using various e-learning and e-content tools and technologies
- Plan, develop, and use multimedia based learning content using open source authoring software
- Use ICT for designing learning experiences using innovative pedagogical approaches
- Explain the role of ICT in authentic and alternative assessment
- Understand the social, economic, security and ethical issues associated with the use of ICT

- Appreciate the scope of ICT for improving the personal productivity and professional competencies
- Appreciate the use ICT in improving educational administration
- Explain the emerging trends in information and communication technology

COURSE CONTENT:

Unit I: ICT and Education

Information and Communication Technology: meaning and nature. Learning theories and its implications for ICT integration in education. National ICT policy, curriculum and schemes
Historical account of the development of various educational media (audio, print, video, storage, display, projection)
Role of technology in emerging pedagogical practices. Visual literacy, media literacy, and new media literacy
Computer hardware fundamentals, computer network-LAN, WAN and Internet. Software – meaning and types: proprietary software and open source software, System software and application software
Emerging Trends in ICT and its educational applications: Augmented reality, e-books and rhizomatic learning, learning analytics, ubiquitous computing and mobile learning, Game based learning, cloud computing and software as service, 3D printing, and marker space

Unit II: E-content and e-resources

Educational applications of word processing, spreadsheet, presentation, and drawing tools – diagrams, concept maps, timelines, flow charts.
Reusable Learning Objects (RLO), e-content standards, authoring tools- open source and proprietary alternatives
Multimedia: meaning and types, multimedia tools-audio editing, video editing, screen casting, graphic editing, basics of animation, and creating interactive media. Evaluation of multimedia resources.
Open Educational Resources – Meaning and importance, various OER initiatives, creative common licensing
Locating internet resources – browsing, navigating, searching, selecting, evaluating, saving and bookmarking
Use of digital still and video camera, digital sound recorder, scanner, printer, interactive white board, visualizer, and multimedia projector for creating and using multimedia resources

Unit III: ICT and Pedagogy

Techno pedagogical content knowledge (TPCK). Approaches to integrating ICT in teaching and learning
Web 2.0 tools for creating, sharing, collaborating, and networking: Social networking, social book marking, blog, wiki, instant messaging, online forums/discussion groups and chats, and media streaming.
E-learning: concept, types, characteristics, e-learning tools and technologies, Learning Management Systems (LMS)
Subject specific ICT tools for creating and facilitating learning. Designing technology integrated authentic learning designs and experiences
ICI integrated Unit plan – Web 2.0 for creating constructivist learning environment
Technology for pedagogical innovations: web quest, PBL, virtual tours, MOOC, flipped classroom
Assistive technology for special needs and inclusion: tools and processes, ICT and Universal design for Learning (UDL)

Unit IV: ICT for Assessment, Management, and professional development

ICT and Assessment**:** e-portfolio, electronic rubrics, online and offline assessment tools – rubrics, survey tools, puzzle makers, test generators, reflective journal, and question bank. Use of web 2.0 tools for assessment,
ICT for professional development - tools and opportunities: electronic teaching portfolio, web 2.0 technologies, technology and design based research, ICT for self-directed professional development, web conferencing, role of OER and MOOCs
ICT for personal management: email, task, events, diary, networking. ICT for educational administration: scheduling, record keeping, student information, electronic grade book, connecting with parents and community, school management systems.
Managing the ICT infrastructure: software installation, troubleshooting of hardware, seeking and providing help, storage and backup, updating and upgrading software
Computer security: privacy, hacking, virus, spy ware, misuse, abuse, antivirus, firewall, and safe practices, fare use and piracy.

Sessional Work

1. Hands on experience in setting up a desktop PC and working with various input devices, output devices, storage devices, and display devices
2. Using word processor, spread sheet, drawing and presentation software to produce various teaching learning resources and sharing it online
3. Locating internet resources – navigating, searching, selecting, saving, evaluating(use standard internet evaluation criteria), and bookmarking using social bookmarking
4. Creating digital concept maps, flow charts, timelines, and other graphics for a particular content
5. Creating screen cast video and podcast of a lesson
6. Shooting, editing, and sharing of videos segment on any educational topic
7. Creating account in YouTube/slide share and sharing the video/presentation. View and comment on others contributions
8. Creating account in wikispace/wikipedia/mediawiki and adding/editing content
9. Developing an educational blog in www.blogger.com, www.wordpress.com, or www.edublog.com
10. LMS experience- hands on various features of LMS – the ICT course may be provided through LMS
11. Enrolling and completing some MOOC courses of interest
12. Creating resources for flipped classroom and Practicing flipped learning in school during internship
13. Evaluating OER resources. Creating and sharing OER materials- may be in NROER
14. Developing technology integrated unit/lesson plan and trying out this in the school during internship
15. Hands on experience on subject specific software tools like Geogebra, PhET
16. Developing a multimedia e-content for a topic using eXe Learning
17. Field visit to the EduSat center and take part in teleconferencing
18. Planning and creating digital rubrics for any topic and create an e-portfolio
19. Organize web conferencing using Skype or any other tools
20. Review of ICT labs (plans and equipments/resources) in school from internet
21. Interview of computer hardware engineer/ICT specialist regarding Hardware planning, evaluation, maintenance and up gradation
22. Readings on emerging ICT trends in education
23. Review of national ICT policy and curriculum
24. Using FOSS tools for timetabling, grade sheet

References:

1. Andrew A Kling(2010).Web 2.0 (Technology 360). Lucent Books : New Delhi.
2. Andrew M. St. Laurent. (2004). Understanding Open Source and Free Software Licensing. Oreilly: Cambridge

3. Athanassios Jimoyiannis (Editor) (2011). Research on e-Learning and ICT in Education. Springer: USA
4. Barbara B. Levin, Lynne Schrum.(2012). Leading Technology-Rich Schools (Technology & Education, Connections (Tec). Teachers College Press: New York
5. Bharihok Deepak. (2000). Fundamentals of Information Technology. Pentagon Press: New Delhi
6. Bruce M. Whitehead, Devon Jensen, Floyd A. Boschee.(2013). Planning for Technology: A Guide for School Administrators, Technology Coordinators, and Curriculum Leaders. Corwin: New Delhi
7. Crumlish Christian (1999). The Internet No Experience Required. BPB Publications: New Delhi
8. Curtis J. Bonk (2011).The World Is Open: How Web Technology Is Revolutionizing Education. Jossey- Bass: San Fransisco
9. David Moursund (2009).Project Based Learning- Using Information Technology- Second Edition . Viva Books: New Delhi.
10. EdD L. Robert Furman (2012).Instructional Technology Tools: A Professional Development Plan
11. Evant, M: The International Encyclopedia of Educational Technology.
12. Foster,B.R., Walker,M.L., Song,K.H.(2006)A beginning teaching portfolio handbook: documenting and reflecting on your professional growth and abilities. Prentice Hall
13. Gwen Solomon, Lynne Schrum. (2014). Web 2.0 How-to for Educators, Second Edition. ISTE
14. Jean-Eric Pelet (2014).E-Learning 2.0 Technologies and Web Applications in Higher Education (Advances in Higher Education and Professional Development (Ahepd)).Idea Group: U.S.
15. Katherine Cennamo, John Ross, Peggy Ertmer. (2013).Technology Integration for Meaningful Classroom Use: A Standards-Based Approach. Wadsworth: AU
16. Laxman Mohanty, Neeharika Vora (2008). ICT strategies for schools- a guide for school administrators. Sage publications : New Delhi.
17. Lee, William W., Dianna, L. Owens, (2001) Multimedia based Instructional design: Computer Based Training. Jossey-Bass
18. Liz Arney (2015.) Go Blended!: A Handbook for Blending Technology in Schools
19. Loveless Avril (2001). ICT-pedagogy and the curriculum-Subject to change. Routledge Falmer: London.
20. M. D. Roblyer, Aaron H. Doering (2012). Integrating Educational Technology into Teaching (6th Edition)
21. Michael Thomas (2009). Handbook of Research on Web 2.0 and Second Language Learning. Information Science Reference: US.
22. Mishra, S.(Ed.) (2009). STRIDE Hand Book 08: E-learning. IGNOU: New Delhi. Available at http://webserver.ignou.ac.in/institute/STRIDE_Hb8_webCD/STRIDE_Hb8_index.html
23. Mohit K (2003). Design and implementation of Web-enabled Teaching Tools : IRM Press, UK.
24. Montgomery, K., Wiley, D.A.(2004).Creating E-portfolio using Powerpoint- A Guide for Educators. Sage: New Delhi
25. Noam Shemtov, Ian Walden.(2014) Free and Open Source Software: Policy, Law and Practice. Oxford University Press
26. Pradeep Kumar (2011). Web Resources in Pedagogy . Apple Academics: Oakville.
27. Sarkar, S.K. & Gupta, A.K.(1998). Elements of Computer Science. S.Chand & Company: New Delhi
28. Semenov, Alexy (2005). Information and Communication Technologies in Schools. A handbook for Teachers. UNESCO
29. Shalin Hai-Jew. (2012). Open-Source Technologies for Maximizing the Creation, Deployment, and Use of Digital Resources and Information. Information Science Reference: USA
30. Sonny Magana, Robert J. Marzano (2013).Enhancing the Art & Science of Teaching with Technology (Classroom Strategies)

31. Steven W. Anderson, Deborah Siegel. (2014).The Tech-Savvy Administrator: How do I use technology to be a better school leader ASCD

BAE VI.5 : PEDAGOGY OF ENGLISH

Credits: 4 (2L+ 2T +0P) **Marks: 100**
Contact hrs per week: 6 **C1 + C2: 50**
Exam Duration: 2 hrs **C3: 50**

Objectives:
Student teachers

- understand classroom strategies and techniques to be employed in teaching English Language
- comprehend the nuanced subtleties of a political and social vision of language teaching
- develop the ethic of radical individualism, an ethic that positions the classroom as a privatized space and teachers as autonomous, self-developing individuals
- develop a meaningful framework within which individual exercises or readings could be placed
- understand and promote the presence of multicultural voices in the teaching of language
- promote pedagogical inquiry requiring an ongoing process of discovering-and responding to-revisionary possibilities

COURSE CONTENT:

Unit I: Language Processes and the Classroom Context

Academic language and oral language in classrooms; Participation in the classroom; Facilitating language interaction and independence. Promoting classroom environment of confidence for language use;
Space for "risk taking"; Reading:
Introducing and engaging with books of different types; Comprehension of stories and non-fiction (content area texts); Understanding and appreciating literature:
Reading- its aesthetic and emotive aspect; Writing as a composing process: Problem solving, developing a sense of audience, purpose, and understanding the process of writing.

Teaching prose- overview of the principles, aims and objectives and methodology of teaching literature as a subject- text selection, canon-formation and problems of representation- appraoches and techniques for teaching prose fiction like short story and novel- selection of appropriate material and teaching strategies for different elements-- selection of appropriate materials and teaching strategies for different elements of narrative and style—focus on links between reading and writing – teaching prose for literary development, cultural literacy and creative and critical thinking.

Unit II: Examining the language curriculum

Role and significance of Curriculum and syllabus.
Syllabus of different languages; Review of textbooks, use of literature in language textbooks, critical analysis of exercises and; Moving beyond the textbook: Children's literature for different age groups; Classroom practices in India
Introduction of approaches and techniques for teaching poetry-- material and teaching areas for different elements of poetry-- links between reading and writing about poetry-- teaching of poetry for literary development, cultural literacy and creative and critical thinking.
Preparing lesson plans based on NCERT textbooks from Class VI to IX and transacting them in the classroom. This would be followed by peer assessment

Unit III: Challenges in Language Learning

Issues of non-comprehension; lack of independence in language use; Examining the role of school context in creating difficulties for language learners; Understanding language "disability" and the language teacher's role in dealing with it.

Language Policies and Politics

Power, identity, and politics of language; Language as a medium of instruction and debates about English as a medium of instruction; The recommendations of NCF-2005 on language education

Teaching of Drama: Approaches and techniques—materials and strategies for teaching different elements of drama—links between reading, performance and writing—teaching of drama for literary development, cultural literacy and creative and critical thinking.

Unit IV: Assessment and Evaluation

Performance assessment and Portfolios; integrating assessment with instruction; assessment of learning process and higher order skills; Performance and portfolio approach to assessment

Assessment of all the linguistic skills, categories and classifications of assessment process, manoeuvres of languages- negotiations, making requests, skills of persuasion, arguments, debates and deliberations, developing suitable scoring mechanisms

Principles of Assessment and various ways of assessing literature—traditional pen and paper assessment, extended writing, project work and portfolio keeping—creation of opportunities for student teachers to practise marking Literature essays, to set and critique different questions, tests and examination papers.

Continuous and Comprehensive evaluation

Using rich questions, peer and self-assessment.

Sessional Work:

Students practice peer assessment and self-assessment by observing classroom teaching-work in pairs and write observation sheets. Conduct discussions and debates with peers about the performance.

Assess the four linguistic skills- effective communication skills in negotiations, making requests, offering suggestions, creative writing etc- development of suitable scoring mechanism.

References:

1. National Curriculum Framework, 2005, NCERT
2. Position Paper on English, NCERT
3. Anderson, Ann and Lynch Tony: Listening, Oxford University Press, 1988
2. BaruahT.C : The English teachers Handbook, Sterling publishers Pvt.Ltd. 1984
3. Billows F.L: The Techniques of English Language Teaching, Longman Group Ltd., London 1961
4. Bright, J.A., and McGregor G.P: Teaching English as a Second Language, ELBS London, 1972.
5. Gordon B.S: The Teaching of English in free India, Christian Literature society, Madras, 1960.
6. Harris: Testing English, Tata McGraw Hill, Bombay, 1974
7. Hornby: Stage 1,2,3 & 4 Teaching of Structural words, Sentence patterns ELBS & OUP, London 1959.
8. Hubbard, P., Jones H: Thornton B and Wheeler, R. Training Course for TEFL, Oxford University press,

BAE VI.6 : PEDAGOGY OF SOCIAL SCIENCE

Credits: 4 (2L+ 2T +0P) **Marks: 100**
Contact hrs per week: 6 **C1 + C2: 50**
Exam Duration: 2 hrs **C3: 50**

Objectives: To enable the prospective teachers:

- To develop comprehensive understanding of different approaches, methods and strategies of teaching social sciences and make use of them in their practice teaching in simulated situation as well as real classroom setting in the schools.
- To develop their competencies in teaching social sciences by planning and implementing appropriate lessons in simulated classroom situation.
- To design and make develop appropriate learning resources including E-content for teaching social sciences.
- To familiarize with different evaluation approaches and devices for assessing students' learning in social sciences.
- To develop an achievement test in social science by following laid down procedures and analyze the test data and report the results suing appropriate formats.
- To critically analyze the curricular reforms in social sciences at the state and central level.
- To assess and evaluate the teaching and learning processes and their implications in the professional development of social science teachers.

COURSE CONTENT:

Unit I: Approaches to Teaching in Social Sciences

Rationale and evolution of teaching and learning social sciences; Issues and key questions central to teaching social sciences in schools.

Conventional pedagogies: Storytelling, lecture-cum-discussion

Cooperative learning strategies: Think-pair-share, Reciprocal peer teaching, round robin.

Interactive pedagogies: Constructivist approaches, project based learning, social inquiry, critical pedagogy, group discussion, role play, activity method.

Interdisciplinary instruction: Concept mapping, Map based leaning, Field Study, Source method, Biographical method.

Multiple intelligences teaching strategies: Visual discovery, Social science skill builder, Experiential exercises, Problem solving group work.

Unit II: Preparation and Use of Learning Resources in Social Sciences

Technology as a learning site in social sciences; Preparing and using audio-visual materials for effective teaching: Charts, Models, Maps, Atlas, Graphs, Audio programs, Print media; Worksheets, Self-learning materials;

Integration of ICT in teaching social sciences; Offline and online digital resources; Using multi- media for teaching social sciences; Websites and virtual tours; Critical analysis of instructional Video or Television program; Development and utilization of E-content and Open Educational Resources.

Setting up and using social science room in schools; Effective use of library resources in learning social sciences; Utilization of community resources for teaching social sciences.

Unit III: Assessment of Learning in Social Sciences

Understanding assessment and evaluation of learning in social sciences: formative and summative evaluation; formal and informal methods of assessment; written test and performance tests.

Construction of achievement test in social sciences; Developing test item: Objective type test items, Multiple choice, True-False, Matching, Fill-in-the blank, Short answer type, Essay questions.

Using alternative assessment in social sciences classroom: Rubrics; Portfolio; Projects; Diagnostic testing and remedial teaching in social sciences.

Analyzing achievement test data and using for improvement of teaching and learning; Reporting results of evaluation and providing feedback to the learners.

Unit IV: Curriculum Reforms in Social Sciences and Professional Development of Teachers

Understanding curriculum reforms in social sciences; Recent initiatives for reforming school curriculum at the States and the Center and their implications on teaching social sciences; Critical analysis of the reforms in social science curriculum envisaged by NCF 2005.

Social science teacher as a reflective practitioner; Need for professional development of social science teachers; Avenues for professional development; In-service teacher development programs: face-to-face, distance and online programs; Networking with teachers; Teachers organization; Writing reflective journals.

Teaching as inquiry: Read and use research – outcome linked evidence; Seek professional development opportunities that familiarize with research evidences; Identify and use best pedagogic practices that help to achieve prioritized outcomes; Action research.

Practicum

- Practice teaching in simulated situation. At least four lessons, one each in four social science disciplines, to be taught to the peers under the supervision of a mentor, using appropriate teaching approaches and strategies, followed by feedback, and reflection by the student teacher.
- Planning and implementation of a lesson to teach any social science topic to the peer group based on any one of the cooperative teaching or multiple intelligence teaching strategies.
- Preparation of charts, models, worksheets, self-learning materials for teaching the social science lessons planned by the student teachers.
- Development of e-content (Audio or Video program) using the CAL / ET Cell Studio of the Institute.
- Construction of an achievement test in social sciences based on the textbooks of class IX or X.
- Critical analysis of the reforms in social science curriculum envisaged in the recent policy documents such as NPE, NCF, and Reports of Commission/committees on education etc.
- Visit a school and interview social science teachers and report about their professional development activities.

References:

1. Allen, J and Landaker, C. (2004). Reading history: Strategies to improve comprehensions and connections in social studies classes. New York: Oxford University Press.
2. Arora, P. (2014). Exploring the Science of Society. Journal of Indian Education, NCERT.
3. Batra, P. (2010). Social science learning in schools: Perspectives and challenges. New Delhi: Sage publications India.
4. Binning, A. A. and Binning, D. H. (1952). Teaching of social studies in secondary schools. Bombay: Tata McGraw Hill.
5. Burz, H. L. and Marshall, K. (1998).Performance based curriculum for social studies: From knowing to showing. Thousand Oaks: Corwin Press, INC.
6. Dhamija, N. (1993). Multimedia approaches in teaching social studies. New Delhi: Harman Publishing House.
7. Farris, P. J.(2001). Elementary and middle education social studies: An interdisciplinary instructional approach. New York: McGraw Hill.
8. George, A. M and Madan, A. (2009). Teaching social science in schools. New Delhi: Sage Publications India.

9. Graeme Aitken and Claire Sinnema (2008). Effective pedagogy in social sciences: Best evidence iteration. Wellington: Ministry of Education, Newsland. [Available on www.ibe.unesco.org].
10. Jack Zevin (2000). Social studies for twenty-first century: Methods and material for teaching in middle and secondary schools. Mahwah, NJ: Lawrence Erlbaum Associates.
11. Mehlinger, H. D. (Ed.) (1981). UNESCO Handbook for Teaching Social Studies. Paris: UNESCO.
12. National Policy on Education 1968 and 1986
13. National Policy on Education 1986-Programme of Action 1992.
14. National Curriculum Frameworks 1975, 1988, 2000 and 2005.
15. NCERT (2005). Position paper: National Focus Group on Teaching of Social Sciences.
16. Root, M. (1993). Philosophy of Social Sciences. Oxford: Blackwell.
17. Sartori, G. (Ed.) (1984). Social concepts: A systematic analysis. New Delhi: Sage Publications.

SEVENTH SEMESTER

Discipline Specific Elective DSE 1 : English Literature

BAE VII.1 : MODERNISM, POST MODERNISM, STRUCTURALISM AND POST STRUCTURALISM

Credits 3 (1L+2T+0P) **Max. Marks: 100**
Contact Hours per week: 5 **C1+ C2: 50**
Exam duration: 2 Hrs **C3: 50**

Objectives:

- To provide the student-teachers with a basic insight into the changes in perceptions that has come in the post-world-war generation.
- To make the student-teachers aware of the themes of a rapidly changing literary and artistic scenario.
- A comprehensive view of an emerging panorama of the fusion that is taking place across the different artistic ideologies.

COURSE CONTENT:

Unit I: **Modernism**

Raymond Williams, from 'Forms,' in Culture (London: Fontana. 1981), pp. 154-80.
Stephen Greenblatt, 'Introduction' in Renaissance Self -Fashioning
(Chicago: University of Chicago Press, 1980), pp. 1-9.
Alan Sinfield and Jonathan Dollimore, 'Foreword' and
'Introduction' in Political Shakespeare. New Essays in Cultural
Materialism (Ithaca: Cornell, 1985), pp. vii-viii, 2·17.

Unit II: **Postmodernism**

Jean-Francois Lyotard, 'Answering the Question: What is
Postmodernism?,' from The Postmodern Condition: A Report on
Knowledge (Minneapolis: University of Minnesota Press. 1984).

Unit III: **Structuralism**
Michel Foucault, 'Truth and Power,' from Power and Knowledge (New York: Pantheon, 1977).
Rolland Barthes : Mythologies
Ferdinand de Sassure: A Course in General Linguistics
Jacques Lacan : Ecritus
Claud Levistraus : The Savage Mind
John Sturrock (ed.): Structuralism and Since
Harrison, Paul; 200; "Post-structuralist Theories"; pp122-135 in Aitken, S. and Valentine, G. (eds); 2006; *Approaches to Human Geography*; Sage, London Davis, Colin; "Levinas: An Introduction"; p8; 2006; Continuum, London.
Levinas, Emmanuel. *Humanism of the Other*. Chicago: University of Illinois Press, 2003. p. 11-12.

Unit IV: **Post-structuralism**
Jacques Derrida, 'Structure, Sign and Play in the Discourse of the Human Science in Modern Criticism and Theory: A Reader, ed. David Lodge (London: Longman, 1988), pp. 108-23.
Louis Althuser : For Marx
Jaques Derrida : Of Grammatology

References :

1. Louis Althusser : Reading Capitalism
2. Francois Dosse : History of Structuralism
3. Claud Levistraus : The View From Far
4. Lissa Downing : Cambridge Introduction to Michael Foucault
5. Terry Eagleton, Literary Theory: An Introduction. 2 nd edn. ((Oxford: Blackwell).

Discipline Specific Elective DSE 1: History

BAE VII.2 : CONTEMPORARY WORLD

Credits 3 (1L+2T+0P) **Max. Marks: 100**
Contact Hours per week: 5 **C1+ C2: 50**
Exam duration: 2 Hrs **C3: 50**

Objectives:
After completion of the course, the student teacher will be able to understand and analyse the conditions of the world in the pre-World War I period, the course of the First World War, the rise and development of Second World War and the Cold War situation.

COURSE CONTENT:
Unit I: The World in pre-World War I period
Defining contemporary history
Hegemony of and conflicts within Europe
Rise of USA and Japan

Unit II: The First World War 1914-1918
Beginning and the course of the War

Russian Revolution
Paris peace conference and treaty of Versailles
League of Nations
The Inter War Period
Economic Depression
Nazism and Fascism
Rise of Soviet Russia under Stalin

UNIT III: The Second World War
Theatres of War
German invasion of the Soviet Union
Allied Forces and Victories
The United Nations Charter

UNIT IV: Cold War
Nature and Impact
Developments in Germany and Vietnam
Disintegration of the communist world

References:

1. Sughata, Bose, Ayesha Jalal, **Modern South Asia** (History, culture and Political Economy), Oxford University Press, Delhi, 1999.
2. Peter Heehs, **Nationalism, Terrorism and Communalism**, Oxford University Press, Delhi, 1998.
3. Sharma R.R. (Ed),: **The USSR in Transition : Issues and Themes** – Atlantic Publication and Distribution, New Delhi, 1995.
4. Hall, D.G.E., **History of South-East Asia**, MacMillan Education Limited, Hampshire, 1995.
5. Arjun Dev, **Contemporary World**, NCERT, New Delhi.
6. Norman Lowe, **Mastering Modern World History**.
7. Brunn, Geoffrey, **The World in the Twentieth Century**, New York.
8. Burns, E M., **Ideas of Conflicts – A Survey of Contemporary Political Thought**.
9. Shapire JS, **The World in Crisis**.
10. Whitehead, AN, **Science and the Modern World**.
11. Peter Heehs, **Modern India and the World,** Oxford University Press, New Delhi, 1991.
12. John Edwin Fogg, **Latin America**, MacMillan Co., London, 1969.
13. Fisher, H.A.L., *History of Europe*, Vols.I & II, Harper Collins Distribution Service, 1969.

Discipline Specific Elective DSE 1. Geography

BAE VII.3A : INTRODUCTION TO GIS AND REMOTE SENSING

Credits 3 (1L+1T+1P) **Max. Marks: 100**
Contact Hours per week: 5 **C1+ C2: 50**
Exam duration: 2 Hrs **C3: 50**

Objectives:

- To provide an overview of spatial science
- To provide an understanding, basic concept and models of GIS, remote sensing and GNSS.

COURSE CONTENT:

Unit I-Basics of GIS:
Definition, development, components, hardware and software requirements, the basis of GIS mapping: map projections, datum and coordinate systems

Unit II-Data types, data inputs and Data Models in GIS
Sources of spatialdata. Census–Topological maps, Aerial photographs, Satellite images. Spatial data and attributes, data input, scanning, digitization, Data models: vector and raster, spatial and non-spatial data models

Unit III-Remote Sensing
Definition – types – chronological development, Elements of EMR - wavelength regions – energy interaction in atmosphere – absorption – scattering - atmospheric windows – terrestrial interaction – spectral reflectance curves – active and passive remote sensing. Types of satellites – platforms – satellite characteristics: orbits and swaths –Types of Resolution

Unit IV- Basics of GNSS
Introduction - Historical development - Segment of GPS - GPS Satellite Systems - Working principles of GPS

References:

1. Burrough, P. A. and McDonnell, R. A. (1998): Principles of Geographical Information Systems, Oxford University press Inc., New York
2. Chang, K. T. (2008): Introduction to Geographic Information Systems, Avenue of the Americas, McGraw-Hill, New York
3. Environmental Systems Research Institute, Inc. (1998): Understanding GIS: The ARC/INFO Method, ESRI Press, Redlands
4. Goodchild, M. F. (2003): Geographic Information Science and System for Environmental Management, Annual Review of Environment and Resource 28: 493-519
5. Lilles and, T. M., Kiefer, R. W. and Chipman, J. W. (2004): Remote Sensing and Image Interpretation, Wiley, New York
6. Robinson, A. H., Morrison, J. L., Muehrcke, P. C., Kimerling, A. J. and Guptill, S. C. (1995): Elements of Cartography, Wiley, New York

PRACTICALS

Exam Duration: 3hrs **C_3: 50**

COURSE CONTENT:

Introduction to GIS Software

Introduction to Open Source and commercial GIS Softwares for creating maps

Data Input and Georeferencing Data

Coordinate systems, datum conversions, Map projections, types, storing- viewing projection information

Creating Spatial Data

Digitization, creating attribute database, selecting features, simple editing functions, creating new features, Linking features attributes, ways to view data, metadata.

Creating Non-spatial data

Non-spatial: understanding tables, field types, table manipulations, joins, relates, creation of graphs and reports, Creating thematic maps, Map design, map composition

References:

1. Burrough PA, Principles of GIS,OUP, 1998.
2. Maguire D J., Computer in Geography, Longman, London, 1989.
3. Star J.C. and J.E., Geographic Information Systems, An Introduction.

Discipline Specific Elective DSE 1:Political Science

BAE VII.3B: PUBLIC ADMINISTRATION

Credits 3 (1L+2T+0P) **Max. Marks: 100**
Contact Hours per week: 5 **C1+ C2: 50**
Exam duration: 2 Hrs **C3: 50**

Objectives: after completing the course the student teachers will be able to understand and comprehend:

COURSR CONTENT

Unit I: Introduction

Meaning, scope and significance of public administration, evolution of public administration as an academic discipline, public and private administration, new public administration

Unit II: Approaches to the study of Public Administration

Institutional, managerial, behavioural systems, ecological, structural functional approaches, public choice, political economy, Marxian.

Unit III: Principles of Public Administration

Principles of public Administration, hierarchy, unity of command, span of control, authority, responsibility, coordination, delegation, supervision, centralization and decentralization, Line, staggered and Auxiliary agencies

Unit IV: Administrative Behaviour

Decision Making, Leadership theories, communication, control, theories of motivation (Maslow Herzberg)

References

1. Baghel, MP Chattopadhyay, Indu, *Theory of Public Administrations, Vol. I & II*, Global Vision Publishing House, New Delhi, 2009.
2. Basu, Rukmi, *Public Administration Concepts and Themes*, Sterling Publications, New Delhi, 2000.
3. Bhattacharya, Mohit, New Horizons of Public Administration, Jawahar Publishers, New Delhi, 2001.
4. Henry, Nicholas, Public *Administration and Public Affairs*, Prentice Hall of India, New Delhi, 1999.
5. Sharma and Sadana B.L., *Public Administration in Theory and Practice*, Kitab Mahal, Allahabad, 2000.
6. Sharma, M.P, B.L., Sadane, Harpreet Kaur, *Public Administration in Theory and Practice*, Kitab Mahal, Allahabad, 2012.
7. Spru, R. K., *Administrative Theories and Management Thought*, Prentice Hall of India, New Delhi, 2006.

PROFESSIONAL EDUCATION COURSES

BAE VII.4 : CREATING AN INCLUSIVE SCHOOL

Credits: 4 (2L+ 2T +1P) **Marks: 100**
Contact hrs per week: 6 **C1 + C2: 50**
Exam Duration: 2 hrs **C3: 50**

Objectives

The student teacher will be able to:

- Understanding the meaning and significance of inclusive education.
- Appreciate the special needs of Individuals with diverse needs.
- Get Familiarized themselves with the concept of Inclusive Education.
- Understand the nature and needs of different categories of disabled children.
- Understand the concept of Special Education, Integration and Inclusion.
- Understand the different considerations and provisions for facilitating inclusion.
- Understand and Acquire the Skills of Adapting Curriculum to meet the need of the Students with Diverse needs

COURSE CONTENT:

Unit I : Basic Concepts and Introduction to Inclusive Education

Meaning of Impairment, Disability and Handicap; Concept of Special Educational Needs and Diverse Needs, Difference between Special Education, Integration and Inclusive Education. Significance of Inclusive Education; Factors Affecting and Promoting Inclusion.

Unit II : Nature and Needs of Diverse Learners-Identification of Diverse Learners in the Classroom

Sensory Impairment: Hearing impairment and Visual impairment
Physical Disabilities: Orthopaedic impairment, Cerebral Palsy, Special Health Problems, Congenital defects; Slow Learners and Under Achievers; Intellectual Disability; Learning disabilities and ADHD; Autism Spectrum Disorders; Multiple disabilities ; Emotional and

Behavioural Problems; Gifted and Creative; Socially Disadvantaged, Economically Deprived, Religious and Linguistic Minorities, Inhabitants of Geographically Difficult Areas

Unit III: Preparing Schools for Inclusion-General Considerations and Provisions
Concept of Inclusive School, Competencies and Characteristics of inclusive Teacher
Physical Consideration, Socio-Emotional Considerations, Curricular Considerations
Provision of Assistive devices, equipment's and technological support. Special provisions in Evaluation

Unit IV : Inclusive Practices in Classroom
Making learning more meaningful: Responding to special needs by developing strategies for differentiating content, curriculum adaptation and adjustment, lesion planning and TLM.
Pedagogical strategies to respond to needs of individual students: Cooperative learning strategies in the classroom, peer tutoring, buddy system, reflective teaching, multisensory teaching. Use of IT suitable for different disabilities.

Practicum

- Collection of data regarding children with special needs.
- Visit to Inclusive Schools and to observe classroom transaction of any one of such school and make a report of the same.
- Identifying one/two pupils with special needs in the primary schools and preparing a profile of these pupils.
- Preparation of teaching aids, toys, charts, flash cards for children having any one type of disability. (Visit to Resource Room)
- Preparation of Lesson Plan, instruction material for teaching students with disability in inclusive school.
- Developing list of teaching activities of CWSN in the school.

Visits to different institutions dealing with different disabilities and Observation of their Classroom.

* In addition, school and community based activities may be organized.

References:

1. Fimian, M.J., Fafard, M., and Howell, K.W.: *A Teacher's guide to Human Resources in Special Education: Para Professionals, Volunteers, and peer tutors.* Boston: Allyn and Bacon, Inc.
2. Furth, H. (1964). *Thinking without Language.* New York: Free Press.
3. Hallahan, D.P. and Kauffman, J.K. (1988). *Exceptional Children: Introduction to special Education.* N.J.: Englewood Cliffs.
4. Jangira, N.K. (1986). *Special Education Scenario in Britain and India*. Gurgaon: The Academic Press.
5. Jangira, N.K. (2013). NCERT: The Mother of Inclusive Education, Regional Institute of Education NCERT, Ajmer. (Also available on Google search Jangira special education).
6. Julba, A. (2014) Teachers creating Inclusive classrooms: Issues and challenges – A research study
7. Kapoor, S. (2015). Index of Inclusive School Quality, Brotherhood, Delhi.
8. Kothari, R.G. and Mistry, H.S. (2011). *Problems of students and Teachers of the special schools – A study of Gujarat state*. Germany: VDM Publication.
9. Maitra, K. & Saxena, V. (ed)(2008) *Inclusion: Issues and Perspectives,* Kanishka.

10. Meadow, K.P. (1980*). Deafruss and child development.* Berkley, C.A.: University of California Press.
11. Messily,K. (2012). Confronting Marginalisation in Education: A Framework for Promoting inclusion, Routledge, London.
12. Mithu, A. and Michael, B. (2005). *Inclusive Education: From rhetoric to Reality*, New Delhi: Viva Books Pvt. Ltd.
13. NCERT (2006) Position Paper: National Focus Group on Education of Children with Special Needs, NCERT, New Delhi.
14. NCERT (2013) Training and Resource Material on Adolescence Education, New Delhi, available on www.aeparc.org
15. Oza, D. and Pandit, R. (2011). *Management of behavioural problems of children with mental retardation*. Germany: VDM publication.
16. Premavathy, V. and Geetha, T. (2006): Integrated and Inclusive Education DSE(VI) Manual: New Delhi, Krishna Publication.
17. Reed, M. (1984). *Educating Hearing Impaired Children.* Milton Keynes: Open University Press.
18. Sharma, P.L. (1988). *A Teacher's Handbook on Integrated Education of the Disabled*. New Delhi: NCERT.
19. Ramaa S : Website: s-ramaa.net (for various publications)
20. Voluntary Health Association of India. *Disabled 'Village Children' – A Guide for Community Health Workers, Rehabilitation Workers, and Families*.
21. World Bank (2003) Inclusive Education: Achieving Education for all including those with Disabilities and special Education Needs

Web Resources

- IBE-UNESCO (2016). Training Tools for Curriculum Development - Reaching Out To All Learners: a resource pack for supporting Inclusive Education, Ibe.training@unesco.org, http.//www.ibe.unesco
- Video on A World for Inclusion (2007) by UNESCO, directed by David Atrakchi, 20 minutes,http://www.unesco.org/archives/multimedia/index.php?s=films_details&pg=33&id=213
- Children with Disabilities (2012), by UNESCO, 23 minutes, http://www.unesco.org/archives/multimedia/index.php?s=films_details&pg=33&id=2758
- Inclusive Education: Approaches, scope and Content (2008), by UNESCO, produced by International Bureau of education, 11 minutes, http://www.unesco.org/archives/multimedia/index.php?s=films_details&pg=33&id=3314
- Inclusive Education: Learners and Teachers (2008), by UNESCO, produced by International Bureau of education, 14 minutes, http://www.unesco.org/archives/multimedia/index.php?s=films_details&pg=33&id=3316
- Preparing Teachers in Asia-Pacific for Inclusive Education, (2012), by UNESCO, 3 minutes, http://www.unesco.org/archives/multimedia/index.php?s=films_details&pg=33&id=2030
- Preparing teachers for inclusive education: Part 3 & 4, by UNESCO, produced by Lesotho, Ministry of Education, 21 minutes, http://www.unesco.org/archives/multimedia/index.php?s=films_details&pg=33&id=418
- Toward Inclusive schools - Special needs in the classroom, by UNESCO, directed by Mike Fowler, 6 minutes, http://www.unesco.org/archives/multimedia/index.php?s=films_details&pg=33&id=488
- Training Video: Special Needs in the Classroom, (1992), by UNESCO, directed by Mel Ainscow, 46 minutes, http://www.unesco.org/archives/multimedia/index.php?s=films_details&pg=33&id=405
- Including Children with Special Needs Primary Stage (2014), NCERT,http://www.ncert.nic.in/pdf_files/SpecialNeeds.pdf
- Including Children with Special Needs Upper Primary Stage, (2015), NCERT, http://www.ncert.nic.in/gpPDF/pdf/tiicsnups101.pdf
- Julka, A. (2007) Meeting Special Needs in Schools: A Manual, NCERT, http://www.ncert.nic.in/html/pdf/inclusive_education/COVER.pdf

- Position Paper National Focus Group on Education of Children with Special Needs, NCERT, http://www.ncert.nic.in/new_ncert/ncert/rightside/links/pdf/focus_group/special_ed_final1.pdf
- Learning Curves, Inclusive education (2014), Azim Premji Foundation, http://www.teachersofindia.org/en/periodicals/learning-curve-issue-xxiii

BAE VII.5 : HEALTH AND PHYSICAL EDUCATION

Credits: 2 (1L+ 0T +1P) **Marks: 100**
Contact hrs per week: 3 **C1 + C2: 50**
Exam Duration: 2 hrs **C3: 50**

Objectives

The student teacher will be able to:

- to build a scenario of Health Education in India.
- to develop a Knowledge Base of the Most Common and Uncommon Diseases in India; their Diagnosis & Remediation.
- Prospective Teacher Educators to learn the Techniques Related to Health Risks & Learn How to Fix these.
- Prospective Teacher Educators to study the Health Education Vision & Mission of India.
- To acquire the skills for physical fitness, correct postures, habits and activities for development
- Acquire skills to practice yogasanas and meditation and learn the skills of concentration, relaxation, dealing with stress and strain
- Understand and develop psychological abilities as life skills to deal with growing up issues like HIV and AIDS and prevention of substance issues
- Understand the process of assessment

COURSE CONTENT :

Unit I: Health Education Scenario in India

Introduction to the concept of health, significance and importance in the context of ancient and modern Indian perspective
Identity of Educational Institutional Plants: Structure, Infra-Structure and Environment, Time-Space-Personnel-Material Constellation Educational Management System, Emerging Health & Total Quality of the Educational Institutions, Status of Health Education in India from Pre-Natal Education through Higher Education, Yoga & Yog, Health & Hygiene, Clean Toilets, Work & Leisure, Quality of Health – Role of Education, Administrators, Teachers, Students, Supporters,

Unit II: Tech-related Health Risks

Identification of the technological health hazards – Smartphone Stress, Acne caused by the Cell Phones, Blackberry Stress Injuries to the Thumb, Radiation from the cell phones, Cell Phone Sickness, Cell Phone & Car Accidents, Allergies & Phones, Crazy Phones, Computers Causing Wrist Pain, Back & Neck Pain, Decreased Sperm Count from the WIFI, Laptop Burns, Laptop Headaches, Sleeping Problems from the Laptops, Decreased attention span from using Face-book, The Internet Causing Anxiety, Headphone Use leading to Accidents, Hearing Loss from Headphones, Visual Impairment, Death from Social Networking,

Environmental Degradation, Aggression, Social Crimes--- Evolving Controlling & Regulatory Mechanisms.

Unit III: Approaches to Sound Health

Games, Sports & Athletics.
Physical fitness, strength, endurance and flexibility, its components, sports skills, indigenous and self-defence activities.
Games and sports – athletics (general physical fitness exercises), games (lead-up games, relays and major games) rhythmic activities, gymnastics and their impact of health.
Fundamental skills of games and sports; Sports for recreation and competition; Rules and regulation of sports; sports ethics; sports awards and scholarships, sports- personship.
Yoga – Raja Yoga, Karma Yoga, Bhakti Yoga, Jnana Yoga.
Safety and security – disasters in and outside schools, ways of prevention, safety from snake and dog bites, animal attacks, prevention and treatment.
Occupational health hazards and its prevention; Commonly-abused substance and drugs and ways of prevention and inhabitation.
Libraries, Laboratories, Classrooms, Halls, Play Fields, Water Tanks, Swimming Pools, Community Pools, Roads Human Development Index (HDI), Health: Vision, Goals and Objectives of Government of India, Experiments on Influence of Surroundings & Thought, Science of Laughter & Smiles, Health Observation Programs, Impact of TV Serials.
Role of Institutions (schools, family and sports), health services, policies and major health and physical education-related programme, blood banks, role of media.

Unit IV: First Aid – Principles and Uses

Structure and function of human body and the principles of first aid., First aid equipments.
Fractures-causes and symptoms and the first aid related to them, Muscular sprains cause, symptoms and remedies, First aid related to hemorrhage, respiratory discomfort, First aid related to Natural and artificial carriage of sick and wounded person, Treatment of unconsciousness, Treatment of heat stroke, General disease affecting in the local area and measures to prevent them.

Practicum
Surfing to know the diseases in India.
Preventive & Ameliorative measures for health hazards.
Playing Games.
Athletics.
Yoga.
Reflective Dialogues on Serials, such as, Satyamev Jayate on Health of the People.
Preparation of inventories on myths on exercises and different type of food.
Make an inventory of energy rich food and nutritious food (locally available) indicating its health value.
Make an inventory of artificial food and provide critical observations from health point of view.
Home remedies as health care.
Role of biopolymers (DNA) in health of child.
Medicinal plants and child health.
Strategies for positive thinking and motivation.
Preparation of first aid kit.

*** In addition, school and community based activities may be organised.**

References:

1. Arora,P. (2005) Sex Education in schools, Prabhat Prakashan
2. K..Park "Preventive and Social Medicine" Banarsidas Bhanoth, Publishers Nagpur Road, Jabalpur, India.
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4. NCERT (2014). Population Education, Source Material, NCERT, New Delhi.
5. Stephen, J. Williams, Paul R. Torrents, "Introduction to Health Service", Delmore Publications.

Physical Education

1. Deboarh, A. Wuest, Charles, A. Bucher: "Foundation of Physical Education Exercise Science and Sports", Tata McGraw Hill Pvt. Ltd., New Delhi.
2. John, E. Mixton, Ann, E. Jewett: "An Introduction to Physical Education, W.B. Saunders Company, London.
3. John, Cheffers; Tom, Evaul: "Introduction to Physical Education – Concept of Human Movement". Prentice Hall Engle Wood: New Jersey.
4. Bette J., Logdson & Others, "Physical Education for Children", Lea and Febiger, Philadelphia..
5. Roberts, S. Weinberg & Daniel Gould, "Foundation of Sports and Exercise Psychology", Human Kinetics Publication.
6. A.K. Uppal, Lawrance Gray Kumar, "Biomechanics in Physical Education and Exercise Science: Friends Publication, New Delhi.
7. Jack, H. Wilmore, David, L.. Costil, W. Larry Kenney, "Physiology of Sports and Exercise: Human Kinetics Publication.

Yoga

1. Swami Satyanand Saraswati, "Asana Pranayama Mudra Bandh", Bihar School of Yoga, Munger.
2. M.M. Ghore, "Anotomy and Physiology of Yogic Practices". Lonavala Yoga Institute, Lonavala.
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5. "Pranayama" Morarji Desai National Institute of Yoga, New Delhi.
6. MDNIY (2010). "Yoga Teachers Manual for School Teachers, New Delhi.
7. NCERT (2015). Yoga: A Healthy Way of Living Upper Primary Stage, New Delhi.
8. NCERT (2015). Yoga: A Healthy Way of Living Secondary Stage, New Delhi.
9. Agarwal, Satya P. (1998). The social role of the Gītā: how and why, Motilal Banarsidass, ISBN 978-81-208-1524-7, retrieved 17 June 2010.
10. Goel, Devraj & Goel, Chhaya (2013). Universe of Swami Vivekananda & Complete.
11. Wholistic Social Development, CASE Publication under UGC SAP, The M.S. University of Baroda, Vadodara.
12. Jason Liu and Dr. Gwendalle Cooper (2009) *Scientific Analysis of the Effects of Falun Dafa* Presented at International Conference of Psychologists, February 27, 2009 by Catherine Hennessy.
13. Mehroo D. Bengalee (1976).*Child Guidance*. Sheth Publishers, Educational Publishers, 35, Everest, Pedder Road, Bombay.
14. Ministry of Health & Family Welfare, Government of India, *Annual Report to the People on Health*, December 2011.
15. Porter, Noah (2003). *Falun Gong in the United States*: An Ethnographic Study, Master Thesis, Department of Anthropology, College of Arts and Sciences, University of South Florida.
16. Wu JY, Feng, L, Park , H-T, Havlioglu N, Wen L, Tang H, Bacon KB, Jiang Z, Zhang X, Rao Y. (2001). *Molecule that guides Nerve Calls Directs Immune Cells*, Science Daily, Apr. 20.

Web Resources

Position Paper National Focus Group on Health and Physical Education, NCERT
http://www.ncert.nic.in/new_ncert/ncert/rightside/links/pdf/focus_group/health_prelims_final.pdf
Learning curves: sports in education, (2013) Azim Premji Foundation
http://azimpremjifoundation.org/pdf/learning-curve-17.pdf
www.FalunDafa.org
www.http://greatist.com/health/*19-worst-tech-related-health-risks*

BAE VII.6 : READING AND REFLECTING ON TEXT

Credits: 2 (1L+ 1T +0P) **Marks: 100**
Contact hrs per week: 3 **C1 + C2: 50**
Exam Duration: 2 hrs **C3: 50**

Objectives

The student teacher will be able to:

- Understand the meaning, process, importance and characteristics of reading.
- Understand and apply different levels, types, techniques and methods of reading.
- Acquaint with the skills of reading different types of texts.
- Develop different types of reading skills through various activities and met cognition
- Learn the skills of reading comprehension and to enhance vocabulary.
- Acquaint with the problems of reading across curriculum.

COURSE CONTENT

Unit I: Introduction to Reading

Reading – Meaning and Process, Importance of Reading across Curriculum, Characteristics of Reading, Developing reading skills. Role of libraries in promoting reading habits

Unit II: Techniques and Methodology of Reading

Levels of reading – literal, interpretative, critical and creative, Types of reading – intensive and extensive reading, oral & silent reading, Reading techniques – skimming and scanning. Methodology of reading

Unit III: Reading the Text

Types of Texts – Narrative, expository, descriptive, suggestive, empirical, conceptual, ethnography, policy documents, field notes; Importance of Different Texts in Curriculum

Unit IV : Developing Reading Skills and Reading Comprehension

Developing Critical Reading Skills, Developing Reflective Skills, Activities for Developing Reading Skills, Developing Metacognition for Reading, Developing Reading Comprehension Developing Vocabulary for Reading, Problems of Reading

Practicum

- Divide the class in small group and provide different kinds of texts and instruct them to read and reflect according to the nature of text.
- Divide the group and provide one text and suggest students to make different interpretations.
- Design vocabulary games to enhance vocabulary.
- Read the text and provide a five words summary to each paragraph.
- Reading and comprehension exercises.
- Skim through the text and give suitable title to the text.
- Complete given text in stipulated time and summarize it in 6/7 lines with a suitable title.
- Making an oral presentation
- Organising a debate, discussion based on their reading
- Preparation of a poster
- Making a collage
- Displaying appropriate texts/graphic on bulletin board

- Addressing morning assembly during their internship in schools
- Making a power point presentation on selected topic
- Submission of written articles/assignments
- Writing maintaining reflective journals

*** In addition, school and community based activities may be organized with provisions for visits to innovative centres of pedagogy and learning, innovative schools, educational resource centres, etc. Action research based on teaching learning and school and community could be conducted.**

References:

1. Bright, J.A., and McGregor, G.P. (1970). *Teaching English as a Second Language.* ELBS: Longman.
2. Doff, A. (1988). *Teach English: Training Course for Teachers.* Cambridge: Cambridge University Press.
3. Hill, L.A., and Dobbyn, M.A. (1979). *Training Course, Trainer's Book.* London: Cassell.
4. Hubbard, P., and Hywel, J. et al (1983). *A Training Course for TEFL.* Oxford University Press.
5. Joseph, K.S. (2004). *Self Instruction in English Grammar and Figures of Speech.* Vadodara: Gold Rock Publications.
6. Mukalel, J.C. (1998). *Approaches to English Language Teaching.* New Delhi: Discovery Publishing house.
7. Mukalel, J.C. (1998). *Creative Approaches to Classroom Teaching.* New Delhi: Discovery Publishing house.
8. Mukalel, J.C. (1998). *Psychology of Language Teaching.* New Delhi: Discovery Publishing House.
9. Mukalel, J.C., and Ahmed, S. B. (1984). *Teaching English in India.* New Delhi: Arya Book Depot.
10. Nagaraj, G. (1996). *English Language Teaching Approaches, Methods and Techniques.* Calcutta: Orient Longman.
11. Richard, J.; Theodore, S. and Rodgers, T.S. (1968). *Approaches and Methods in Language.* Cambridge University Press.
12. Venkateswaran, S. (1995). *Principles of Teaching English.* New Delhi: Vikas Publishing House.
13. Wilkins, D.A. (1982). *Linguistics in Language Teaching.* London: Edward Arnold.
14. Willis, J. (1981). *Teaching English through English ELBS.* England: Longman Ltd.
15. Yule, G. (1985). *The Study of Language.* Cambridge: Cambridge University Press.
16. My experiments with the truth – *Autobiography of Mahatma Gandhi*
17. The Little Prince – *Antain de Saint* – Exupery
18. Cultural Heritage – Dr. S. Radhakrishnan
19. Periodicals Like – Outlook, India Today, Economic and Political Weekly, Business Today, Journals of Education, Organiser – weekly
20. Recognizing Different Types of Text

Web Resources

- http://www.bbc.co.uk/skillswise/factsheet/en03text-l1-f-different-types-of-text

Models of Reading Process

- http://people.ucalgary.ca/~mpeglar/models.html
- http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3001687/
- http://www.tarleton.edu/Faculty/gentry/reading%20models.html

Reflective Skills

- http://www.skillsyouneed.com/ips/reflecting.html
- http://www.skillsyouneed.com/ps/reflective-practice.html

BAE VII.7A : INTERNSHIP IN SCHOOL SUBJECT 1 : English
&
BAE VII.7B : INTERNSHIP IN SCHOOL SUBJECT 2 : Social Science

(Evaluation in each school subject shall be as per the break up shown below)*

Credits : 6+6 **Marks: *100**
Duration : 10 Weeks **C1 + C2 : 50**
C3 : 50

The activity is divided into three phases:

A. Pre – internship - 2 weeks
B. Internship - 6 weeks
C. Post internship - 2 weeks

A. Pre internship

Objectives:

- To facilitate student teachers in designing and executing lessons in each pedagogy.
- To develop in student teachers the skills of observation and evaluating teaching of their peers

Activities

The student teachers will
- plan and teach minimum 3 lessons in each pedagogy
- observe minimum 5 lessons of their peers in each pedagogy
- participate in the mentoring sessions to plan lessons under the guidance of mentors.

B. Internship

Objectives:

To provide the student teachers with the field experience of getting attached to a school for a long duration and develop professional skills of teaching, participate in various day to day functions of schools, and in organizing various activities.

Activities

- The student teachers will teach 20 lessons at secondary level in each pedagogy.
- The student teachers will observe minimum of 5 lessons at upper primary level and 10 lessons at secondary level of their peers in each pedagogy.
- The student teachers will organize various activities- co-curricular and extended subject

based in the school.

- The student teachers will participate in various academic and administrative activities including monitoring and supervising students in school conducted tests and examinations.
- The student teachers will diagnose the learning difficulties of students and provide remedial instruction.
- The student teachers will conduct CCE and unit tests and prepare evaluation records
- The student teachers will carry out action research project, analyse and write the report.

C. Post Internship

Activities

- Submission of internship records - evaluation records, activity record, observation records, reflective diary
- PPT Presentation of reflectiions

Evaluation in each pedagogy is as follows:
C1 – Pre-internship activities
C2 – Internship records and post-internship presentation
C3 – Internship in teachingxg

EIGHTH SEMESTER

Discipline Speicfic Elective 2 :English Literature

BAE VIII.1 : NEW LITERATURES

Credits 3 (1L+2T+0P) **Max. Marks: 100**
Contact Hours per week: 5 **C1+ C2: 50**
Exam duration: 2 Hrs **C3: 50**

Objectives:
- To provide the student-teachers with a basic insight into the emerging trends in literature.
- To acquaint the student-teachers with diasporic writings.
- To make them familiarize with the marginalized voices and counter-cultures.

COURSE CONTENT:
Unit I: Poetry-1
Adrienne Rich: 'Aunt Jennifer's Tigers', 'Necessities of Life'.
Philip Larkin : 'Whitsun Weddings', 'Annus Mirabilis'
Seamus Heaney: 'Bogland', 'Traditions',
Kahlil Gibran : The Prophet

Unit II: Prose
Stanislavski, An Actor Prepares (Penguin) Chapter 8. "Faith and the Sense of Truth,", sections 1,2,7,8, 9 (pp. 121--5, 137—46).
Raymond Williams, Tragedy and Revolution in Modern Tragedy, revised edition (London,: Verso, 1979) pp. 61—84.
Bertolt Brecht, 'The Street Scene' (pp. 121-8), 'Theatre for Pleasure or Theatre for Instruction' (pp. 68-76) and 'Dramatic Theatre vs. Epic Theatre' (chart)- (p.31) from Brecht on Theatre. The Development of an Aesthetic, ed. John Willet (London : Methuen, 1992).
Antonin Artaud, 'No More Masterpieces', from The Theatre and its Double (London : Calder and Boyars, 1970), pp. 55.63.
George Steiner, 'On Modern Tragedy', from The Death of Tragedy (London : Faber), pp. 303-24.
Jean Genet, Reflections on Theatre (London: Faber), chapter 2: 'The Strange Word Urb...' pp.63-74.
Topics : Naturalism, expressionism in theatre; Forms of realism in Pablo Neruda : 'Poetry', 'Tonight I can Write', 'The Way Spain Was', 'Ars Poetica',

Unit III: Fiction
Gabriel Garcia Marquez : Chronicle of a Death Foretold
Feydoor Dostoesky : Crime and Punishment
Italo Calvino : Invisible Cities
Mario Vargas Llosa : The War of the End of the World
Nikoz Kazanzakis : The Last Temptation of Christ
Albert Camus: Plague
Franz Kafka : Trial

Unit IV: Drama
Dario Fo : Accidental Death of an Anarchist
Bertolt Brecht :Mother Courage and Her Children
Jean Genet :The Balcony (Faber)
Eugene Ionesco :Rhinoceros (Penguin)

References:
Umberto Eco: The Name of the Rose Cambridge University Press: Cambridge Companion to Commonwealth Literature

Discipline Specific Elective 2 :History

BAE VIII.2 : ASPECTS OF REGIONAL HISTORY AND CULTURE

Credits 3 (1L+2T+0P) **Max. Marks: 100**
Contact Hours per week: 5 **C1+ C2: 50**
Exam duration: 2 Hrs **C3: 50**

(The Paper Carries 100 Marks which is to be evaluated internally and phase wise in the Term end examination)

Objectives:
The students are expected to be acquainted with the use of original sources and research methodology for preparing the project report. Topics of the study of project work shall be decided by the concerned faculty member of the institute.
Report of the project field work shall be examined by internal faculty members.

COURSE CONTENT:
Unit I: Use of Original sources in History

Unit II: Research Methodology in History (Selection of the title/topics, Objectives**,** Hypotheses, developments of the tools)

Unit III: Projects in History

Unit IV: Report Writing (Collection, analysis and tabulation of data and final Project Report writing).

Some Suggested Topics:
1. History of Indian Cinema (Pre 1947)
2. Agrarian System in Medieval India
3. Visualizing early Indian Culture
4. Cartography in Medieval India
5. Fortification of Medieval Deccan
6. Women's History
7. Regional History: Karnataka, Andhra Pradesh, Tamil Nadu, Telangana, Kerala, Puduchery,
8. Science and Human past
9. Reading Sources on Early Indian Society
10. History of Architecture in Medieval India

11. History of Urban Cities
12. World of Indian Ocean

Methodology:
C1: from selection of the title/topics to developments of the tools
C2: Collection of data and analysis of data
C3: Final Field Work/Project Report

References:

1. Renu Saran (2012): History of Indian Cinema, Diamond Pocket Books Pvt Ltd
2. Irfan Habib (2013): The Agrarian System of Mughal India: 1556-1707, OUP India; 3 edition
3. Gazetteer of India, Volume-2 (2009): History and Culture, Publication Division of India
4. Schwartzberg, Joseph E. (2008), "Maps and Mapmaking in India",
5. Encyclopaedia of the History of Science, Technology, and Medicine in Non-Western Cultures (2nd edition) edited by Helaine Selin, pp. 1301–1303, Springer, ISBN 978-1-4020-4559-2.
6. Sircar, D.C.C. (1990), Studies in the Geography of Ancient and Medieval India, Motilal Banarsidass Publishers, ISBN 81-208-0690-5.
7. Kamalapur, J. N.(1961): The Deccan forts; a study in the art of fortification in mediaeval India; Bombay, Popular Book Depot.
8. Bell Hooks (2000): Feminism Is for Everybody: Passionate Politics; South End Pr.
9. K. A. N. Sastri, A History Of South India 4th Edition: University Press-New Delhi.
10. Romila Thapar: Penguin History Of Early India; Penguin Publications.
11. Monica Juneja (2010): Architecture in Medieval India: Forms, Contexts, Histories;Orient Blackswan PUB
12. Edward A. Alpers (2014): The Indian Ocean in World History (New Oxford World History); OUP USA.
13. Shiekh Ali, History: Its Theory and Method, McMillan, 1999.
14. K N Chitnis, Research Methodology in History, Atlantic Publications, New Delhi 2007.
15. Tej Ram Sharma, Research Methodology in History, Concept Publishing Company, New Delhi 2001.

Discipline Specific Elective 2 : Geography

BAE VIII.3A : HUMAN GEOGRAPHY

Credits 3 (1L+1T+1P) **Max. Marks: 100**
Contact Hours per week: 5 **C1+ C2: 50**
Exam duration: 2 Hrs **C3: 50**

Objectives:
The objectives of this course are to acquaint the students with the nature of man-environment trelationship and human capability to adopt and modify the environment under its varied conditions from primitive life style to the modern living; to identify and understand environment and population in terms of their quality and spatial distribution pattern and to comprehend the contemporary issues facing the global community.

COURSE CONTENT:

Unit I: Nature and Concept
Nature, scope and Significance of Humangeography. Concept of man and Environment: Determinism, Possibilism, Neo-Determinism and Probabilism. Branches of Human Geography.

Unit II: Human Settlement
Origin and growth of Primitive Settlements, Site, situation and Locational Characteristics of Settlements. Patterns and Hierarchy of Rural and Urban settlements. Central Place Theory. Central Business District (CBD)

Unit III : Races and Tribes
Evolution of man: (Australopithecus, Homo Erectus, Homosapiens. Man's spread over the earth during the Pleistocene) World Human Race: Basis of Human Race, Griffith Taylor classification of Human Race. Tribes: Regional Distribution of Tribes in the World, Eskimos, Kirghiz, Bushman, and Pygmies. Habitat. Tribes in India: Economy and Society of Indian Tribes: Bhil, Gond, Santhal, Nagas.

Unit IV: Demographic Characteristics
Major languages and their distributions in the World and India. Major Religions and their distributions in the World and India. World Population: Growth and Distribution. Factors affecting Spatial Distribution of Population. Migration: Types, Causes and Consequences. Demographic Transition.

References:

1. Bergwan, Edward E: Human Geography; Culture, Connections and Landscape, Prentice-Hall, New Jersey.1995.
2. Carr, M.: Patterns, Process and change in Human Geography. MacMillan Education, London, 1987.
3. Fellman,J.L.: Human Geography—Landscapes of Human Activities. Brown and Benchman Pub., U.S.A., 1997.
4. DeBlij H.J.: Human Geography, Culture, Society and Space, John Wiley, New York,1996.
5. Johnston,R.J.(editor).:Dictionary of Human Geography Blackwell,Oxford, 1994:

6. McBride,P.J.:Human Geography Systems, Patterns and Change, Nelson, U.K. and Canada, 1996.
7. Michael, Can: New Patterns: Process and Change in Human Geography Nelson,1997
8. Rubenstein,J.H.and BaconR.S.:The Cultural Landscape—an Introduction to Human geography. PrenticeHall,India, New Delhi,1990.
9. Singh, K.N.: People of India, An introduction Seagull Books, 1992
10. Spate O.H.K. and Learmonth A.T.A.: India and Pakistan Methuen, London.1968.
11. Singh R Y: Geography of Settlements, Rawat Publications, Jaipur-4

PRACTICALS

Exam Duration: 3hrs **C_3: 50**

COURSE CONTENT:

Field Work and Research Methodology

1. Field Work in Geographical Studies – Role, Value, Data and Ethics of Field-Work
2. Defining the Field and Identifying the Case Study – Rural / Urban / Physical/Human / Environmental.
3. Field Techniques – Merits, Demerits and Selection of the Appropriate Technique; Observation
   (Participant / Non Participant), Questionnaires (Open/ Closed / Structured / Non-Structured);
   Interview with Special Focus on Focused Group Discussions; Space Survey (Transects and Quadrants, Constructing a Sketch)
4. Use of Field Tools – Collection of Material for Physical and Socio-Economic Surveys.
5. Designing the Field Report – Aims and Objectives, Methodology, Analysis, Interpretation and Writing the Report.

Practical Record

1. Each student will prepare an individual report based on primary and secondary data collected during field work.
2. The duration of the field work should not exceed 10 days.
3. The word count of the report should be about **8000 to 12,000** excluding figures, tables, photographs, maps, references and appendices.
4. One copy of the report on A 4 size paper should be submitted in soft binding.

References:
1. Creswell J., 1994: *Research Design: Qualitative and Quantitative Approaches* Sage Publications.
2. Dikshit, R. D. 2003. The Art and Science of Geography: Integrated Readings. Prentice-Hall of India, New Delhi.
3. Evans M., 1988: "Participant Observation: The Researcher as Research Tool" in *Qualitative Methods in Human Geography*, eds. J. Eyles and D. Smith, Polity.
4. Mukherjee, Neela 1993. Participatory Rural Appraisal: Methodology and Application. Concept Publs. Co., New Delhi.
5. Mukherjee, Neela 2002. Participatory Learning and Action: with 100 Field Methods. Concept Publs. Co., New Delhi
6. Robinson A., 1998: "*Thinking Straight and Writing That Way*", in *Writing Empirical Research Reports: A Basic Guide for Students of the Social and Behavioural Sciences*, eds. by F. Pryczak and R. Bruce Pryczak, Publishing: Los Angeles.
7. Special Issue on "Doing Fieldwork" *The Geographical Review* 91:1-2 (2001).
8. Stoddard R. H., 1982: *Field Techniques and Research Methods in Geography*, Kendall/Hunt.
9. Wolcott, H. 1995. The Art of Field work. Alta Mira Press, Walnut Creek, CA.

Discipline Specific Elective 2 : Political Science

BAE VIII.3B : PANCHAYATI RAJ INSTITUTIONS IN INDIA

Credits 3 (1L+2T+0P) **Max. Marks: 100**
Contact Hours per week: 5 **C1+ C2: 50**
Exam duration: 2 Hrs **C3: 50**

Objectives: after completing the course the student teachers will be able to understand and comprehend:

- origin, development, nature, scope, stages and significance, of Panchayat Raj Institutions in India
- recommendations made by different Committees and Commissions on Panchayat raj Institutions in India
- Structure of Panchayat Raj Institutions in India and
- Various problems and challenges faced by the Panchayat Raj Institutions in India

COURSR CONTENT:

Unit I: Panchayati Raj Institutions

Concepts, nature, scope, origin and significance of Panchayat Raj Institutions, stages of development of Panchayat Raj Institutions in India

Unit II: Committees and Commissions

Balawantroy Mehta Committee, G.V.K Rao Committee, L.M., Singhvi Committee, study teams and commissions

Unit III: Structure of Panchayat Raj Institutions

Constitutional provisions, 73rd Amendment Act and after, Eleventh Schedule of the Indian Constitution, Powers and Functions of Panchayat Raj Institutions in India

Unit IV: Problems of Panchayat Raj Institutions in India

Relationship between State governments and Panchayat Raj Institutions, relationship between elected representatives and administration of Panchayat Raj Institutions, mobilization of resources, financial autonomy

References

1. Sharma, Shakuntala, *Grass Root Politics and Panchayat Raj*, Deep and Deep Publications, New Delhi, 1994.
2. Aslam, M., *Panchayati Raj in India*, NBT, New Delhi, 2007.
3. Palanithurai, G., *Dynamics of New Panchayati Raj System in India*, Concept Publishers, New Delhi, 2005.
4. Sharma, Manoj, *Local Government-Rural and Urban*, Anmol Publications, New Delhi, 2004.
5. Sharma, Mukesh, *Panchayati Raj System and Empowerment*, Surabi, Rajasthan, 2002.

GENERIC ELECTIVE 2

BAE VIII.4 : INDIAN CONSTITUTION AND HUMAN RIGHTS

Credits 2 (2L+0T+0P) **Max. Marks: 100**
Contact Hours per week: 2 **C1+ C2: 50**
Exam duration: 2 Hrs **C3: 50**

Objectives:

On completion of this course, the student teacher will be able to

- know the importance, preamble and salient features of Indian Constitution
- appreciate the significance of Fundamental Rights, Duties and Directive Principles of State Policy.
- develop an understanding of the strength of the Union Government.
- understand the functioning of the State Government for the unity and the strength of the Democracy.
- know the importance of local self-Government and Panchayati Raj Institutions in India.
- know the meaning, significance, the growing advocacy of Human Rights.

Transaction Mode:

Through Lectures, Group discussions, Interactive sessions, field activities and use of Education Technology.

COURSE CONTENT:

Unit I: Meaning and Importance of the Constitution

Preamble, Salient features, Constituent Assembly and the Spirit of the Indian Constitution.

Unit II: Fundamental Rights, Duties and Directive Principles

Fundamental Rights, Fundamental Duties, and the Directive Principles of the state policy of the Indian Constitution.

Unit III: Union, State and Local Self Governments

Union Government: Parliament, the President and Prime Minister: State Government: Governor and the Council of Minister: Judiciary: Functions and Powers: Panchayat Raj System.

Unit IV: Human Rights

Origin and Development of Human Rights, Growing Advocacy and Declining Trends of Human Rights, Rights of Scheduled Casts, Scheduled Tribes, Minorities, Children and Women, Human Rights Defenders, Human Rights Violation and Human Rights Organizations.

References:

1. M.V.Pylee, **Indian Constitution**, OUP, New Delhi
2. Granveille Austin, **Indian Constitution**, OUP, New Delhi
3. Rajani Kotari, **Politics in India**, OUP, New Delhi
4. Johari, J C, **Indian Government and Politics**.
5. S R Maheswari, **Local Governments in India (Latest Edition)**
6. R K Arora and Rajani Goyal, **Indian Public Aministration 1995.**
7. C P Bhambri, **Introduction to Indian Constitution**.
8. Subash C Kashyap, **The Working of Indian Constitution,** NBT, New Delhi
9. Subash C Kashyap, **Our Parliament**, NBT, New Delhi
10. Granveille Austin, **Functioning of the Indian Constitution**, NBT, New Delhi.
11. Bipan Chandra**, India after Independence**. Roopa, New Delhi 2000.
12. Arjun Dev, **Source Book on Human Rights**, NCERT, New Delhi.
13. **Human Rights in India: Theory and Practice**, National Book Trust, 2001.

PROFESSIONAL EDUCATION COURSES

BAE VIII.5 : KNOWLEDGE AND CURRICULUM

Credits: 4 (2L+ 2T +0P) **Marks: 100**
Contact hrs per week: 6 **C1 + C2: 50**
Exam Duration: 2 hrs **C3: 50**

Objectives:

This course is designed to help student teachers to

- Understand the concept and the need for curriculum in schools.
- Explore the influences of the knowledge categories, social, cultural, economic and the technological aspects in shaping the present school curriculum and the text books.
- Analyze the principles employed in sequencing the school curriculum and the syllabus at different levels.
- Identify various learning sites and resources operating as curriculum supports in the system.
- Analyze the multiple roles of schools in implementation of curriculum.
- Discuss the roles and responsibilities of curriculum stakeholders.
- Analyse the role of teachers in operational sing the curriculum.
- Examine the processes and criteria commonly used to evaluate curriculum in pursuit of improvement.
- Explore the evaluation approaches adopted to revise the curriculum at the national and state levels.
- Analyze the national curriculum frameworks for necessary reforms proposed and their implications at school level.
- Develop an image of oneself as a curriculum informant, designer, agent, and evaluator.

COURSE CONTENT:

Unit I: Concept and the nature of curriculum

a) Meanings of curriculum; different perspectives of curriculum; need for curriculum in schools.
b) Educational policy reforms leading to curriculum reforms; Relationship between curriculum framework, curriculum, syllabus and text books- their significance in school education.
c) Meaning and concerns of core curriculum-its need and significance in Indian context; Meaning and concerns of Hidden curriculum and spiral curriculum and their relevance to learning.
d) Types of curriculum: subject-centered, activity-centered, environmental centered, and community-centered and their relevance.

Unit II: Foundations of Curriculum Development

a) **Forms of knowledge & Curriculum:** Forms of knowledge and structure of a Discipline, and their characterization in different school subjects; Logical grammar of different school subjects
b) **Nature of learner & learning:** Nature of learner - needs and interests, and different perspectives on learning (behaviourists, cognitivists and social constructivists) and their implications to curriculum development

c) **Socio –cultural**: Importance of society-school relationships ; Societal factors that affect the curriculum ; Multiculturalism, multilingual aspects, and societal aspirations; Social reconstruction, social efficiency, inequality in educational standards, need for common goals and standards;
d) **Technological determinants** : Science and technological advancements, Using the resources of the information society in curriculum development
e) **Some of the critical issues**: environmental concerns, gender concerns .inclusiveness, value concerns, social sensitivity, and globalization.

Unit III: Process of curriculum Development

a) Understanding shifts in emphasis in approach to curriculum; from subject centered and behaviouristic learning to integrated approach involving development of perspectives, activity centered and constructivist orientation;
b) **Behaviouristic orientation**: Formulating aims and objectives – (general, specific - subject wise and level wise); Selecting content and learning experiences – Principles involved; Organizing the content and learning experiences- Principles (continuity, sequence and integration: organizing elements- concepts, skills, and values); breadth of coverage and depth of understanding; applicability and relevance to school curriculum planning
c) **Constructivists orientation**: curriculum embedded in real life contexts; authentic learning in real life contexts leading to knowledge construction; applicability and relevance to school curriculum planning

Unit IV: Curriculum Implementation and Curriculum evaluation

a) Operationalising curriculum into learning situations; Planning and converting curriculum into syllabus and curriculum engagement activities.
b) Role of teachers in operationalising curriculum in generating dynamic curricular experiences through i) flexible interpretation of curricular aims ii) concept mapping iii) contextualization of learning v) selecting varied experiences and long range and daily planning, choice of resources, planning assessment etc.
c) Planning and use of curricular materials: Text book; teachers hand book, source book, work book, manuals, and other learning materials such as kits, AV and software materials..
d) School culture and climate in implementing the curriculum.
e) Supports to curriculum engagement: available infrastructure and curriculum sites and resources (library, laboratory, playground, neighbourhood etc); Use of community resources in curriculum engagement .
f) Role of external agencies – National, Regional and State in developing the learning supports (including training of teachers) for curriculum implementation.
g) Meaning of curriculum evaluation; Need for curriculum evaluation
h) Process of curriculum evaluation and renewal: collecting opinions and views on school curriculum and text books from different stakeholders; students' attainability of curricular standards as one of the criterion; evaluation of the discrepancies observed between anticipated and observed inputs, transactions and outputs; critical analysis of text books; evaluation of other curricular materials;
i) Role of National, Regional and State bodies in empowering the teachers in evaluating curriculum

Sessional Work:

- Review of national curriculum frame works and write a report for presentation and discussion
- Analysis of teachers' handbooks, text books, workbooks, source books followed by Presentations.

- Readings of certain curriculum reviews and articles bearing significance to the course outlined and reflections on them

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BAE VIII.6 : GUIDANCE AND COUNSELLING

Credits: 4 (3L+ 1T +0P) **Marks: 100**
Contact hrs per week: 5 **C1 + C2: 50**
Exam Duration: 2 hrs **C3: 50**

Objectives

The student teacher will be able to:

- appreciate the nature, purpose and need for guidance and counselling;
- sensitise the student-teachers with the need and relevance of Guidance and counselling.
- demonstrate an understanding of educational, vocational and personal guidance
- develop an understanding of the process of Guidance and Counselling
- understand the process of organization of guidance services in schools
- develop capacity of applying the techniques and procedures of guidance and counselling
- describe various testing and non- testing techniques
- develop the skill of administration and interpretation of psychological tests
- understand the concept and importance of career development.
- analyse the role of the teacher in the provision of Guidance and Counselling
- know the qualities required for good Counsellor

COURSE CONTENT

Unit I: Meaning and Nature of Guidance

Guidance: Concept, aims, objectives, functions and principles.
Need & Procedure for (Educational, Psychological and Social) guidance.
Purposes and Principles of organization of different guidance Services
Organization of guidance services at Secondary Level: Need and Importance
Group Guidance: Concept, Need, Significance and Principles, Organization of Guidance programs in schools.
Role of Guidance Personnel in organization of guidance services in School : Counsellor, Career Master, Psychologist, Doctor, Teacher Counsellor, Head of the Institution, Teacher, Social Worker

Unit II: Meaning and Nature of Counselling

Counselling: Meaning, and nature; Difference between Guidance &Counselling; Principles and approaches of counselling, Individual and Group Counselling; Skills in Counselling- Skills for Listening, Questioning, Responding, & Communicating, Listening Attentively to the concerns of the counselee, Negotiating Self Discovery, Decision Making, Problem Solving etc and values such as Patience, Empathy etc.; Methods and Process of Counselling
Academic, Personal, Career and Behaviour problems of students with special needs, viz. socio-emotional problems of children with disabilities and deprived groups such as SC, ST and girls, need for Counselling; Professional Ethics and Code of Conduct ; Qualities and Qualifications of an effective Counsellor

Unit III: Tools and Techniques of Guidance

Testing and Non-Testing Techniques for Studying and Appraisal of students : a) Testing Techniques: Intelligence/Mental Ability tests, Aptitude tests, attitude scales, Interest inventories, and Personality Tests, b) Non-testing Techniques: Interview, Observation, and Case Study, c) Tools-Questionnaire, anecdotal record, Cumulative Record Cards, etc,
Role of the teacher in Assessment and Testing.

Unit IV: Career Guidance and Counselling

Educational and Career Information in Guidance and Counselling: Meaning, Importance, collection, types, classification of occupational information; Dissemination of Occupational Information: Class talk, career talk, Group discussion, Preparation of Charts and Poster, Career Exhibition, Career conference; Guidance for gifted, slow learner, socio-economically disadvantaged children; Career development: Meaning and Importance; Teacher's role in Career planning, Vocational training and placement opportunities for CWSN. Broad outline with respect to the emerging courses and career options available in India; Guidelines for Establishment of Guidance Cell or Career Corners in Schools

Suggestive List of Activities:

- Group Guidance-Preparation of Class Talk and One Career Talk
- Visit to different Guidance Centre
- Design a checklist/Questionnaire to collect information on students and classify them under educational, psychological or social problem.
- Preparation of Cumulative Record
- To prepare a Case study and Analysis of Case study
- Administration, Scoring & interpretation of at least two tests: One Mental Ability Test and One Aptitude Test
- Job Analysis of a Counsellor
- Preparation of list of problem behaviours based on observation. Detailed study of the Guidance and Counselling Services available in a given School
- Prepare a Chart and Poster for dissemination of Career Information
- Familiarise and write a report of any one of the Personality Tests used in Guidance and Counselling

References:

1. Aggarwal, J. C. (2004). Educational Vocational Guidance and Counselling, Delhi: Doaba House.
2. Asch, M. (2000). Principles of Guidance and Counselling, New Delhi: Sarup and Sons.
3. Bhatia, K. K., (2002). Principles of Guidance and Counselling, Ludhiana: Vinod Publications
4. Bhatnagar, R. P.; Rani. S. (2001); Guidance and Counselling in Education and Psychology.
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18. NCERT (2008). Guidance for Human Development and Adjustment (Module3) New Delhi: NCERT.
19. NCERT (2008). Introduction to Guidance (Module 1). New Delhi: NCERT.
20. NCERT (2005). National Curriculum Framework-2005,NCERT,New Delhi

Web resources

- Introduction to Guidance and Counseling African Virtual university http://oer.avu.org/bitstream/handle/123456789/153/GUIDANCE%20AND%20COUNSELING.pdf?sequence=1
- Ethical Principles of Psychologists and Code of Conduct by APA, http://www.apa.org/ethics/code/principles.pdf
- Guidance and Counselling, http://www.ncert.nic.in/departments/nie/dse/activities/advisory_board/pdf/guidelines_for_guidance_and_counseling.pdf
- http://www.egyankosh.ac.in/

BAE VIII.7 : VALUE AND PEACE EDUCATION

Credits: 2 (1L+ 1T +0P) **Marks: 100**
Contact hrs per week: 3 **C1 + C2: 50**
Exam Duration: 2 hrs **C3: 50**

Objectives

The student teacher will be able to:

- Understand the need and importance of education for peace and values.
- Understand the nature, characteristics and types of human values.
- Understand the five core values of Truth, Righteous conduct, Peace, Love and Non-Violence.
- Appreciate the developments in Peace Education in India and Abroad.
- Understand various methods, techniques and approaches of value development.
- Appreciate the preamble to the constitution and values inherent in it.
- Understand various models of value education.
- Appreciate the importance of living together and imbibe in their attitude and behaviour.

COURSE CONTENT

Unit I: Concept, Meaning and Nature of value

Concept and meaning of value and Peace:
Indian and Western perspectives on value and Peace.
Reflections of great Indian thinkers on values and Peace (Gandhiji, Swami Vivekananda, Sri Aurobindo, Rabindratha Tagore, J. Krishmamurthi)
Understanding Peace in the individual, Social, National and International context
Nature and characteristics of values
Sources and selection of values -culture and human needs

Unit II : Concept, Meaning and Nature of Peace

Historical development of Peace education in India and in the world

Preamble to the Indian Constitution and values inherent in it

Exposition of the five human values of Truth, Righteous Conduct, Peace, Love and Non-Violence with illustrations from life and literature.

Creation of United Nations, UNESCO, UNICEF and their role in promoting value and Peace Education.

Judgement of the Supreme Court on Value Education

Unit III : Concept and need for Value-based Education and Education for Peace

Concept of value based education and Education for Peace with special reference to peace to Indian view of life;

Paradigm shift from Peace education to Education for Peace.

Need for and importance of value based education and Education for Peace in the present scenario.

Aims and objectives of value based and Peace education

Recommendations of Sri Prakasha Committee (1959) on value education.

Recommendations of Parliamentary Committee of HRD on Values Education (1996-90) headed by Shri S.B. Chauhan.

Curriculum development and Models of Value Education.

Models of value education; Rationale building model, the consideration model, valuing process and clarification model.

Curriculum development; State specific approach – Elementary, Secondary, Higher Secondary and Higher Education.

Integration of human values with all (school) academic subjects.

Unit IV :Pedagogy of Value Education and Education for Peace

- Approaches and Techniques of teaching human values:-
  Direct approach: value based Story-telling, Group activities (dramatization, literary activities, games and sports, service activities), Counselling, organizing value based co-curricular activities.
  Indirect Approach; Incidental Approach with illustrations
  Integrated approach: Integration into curricular, co-curricular activities and subjects (with illustrations of integration from Language, Mathematics, science and social science , art and aesthetics , Yoga and health education,

- Teacher as Role Model.
- Role of school ambience and environment in development of values.

Practicum

- Develop / compile stories with values from different sources and cultures, organize value based co-curricular activities in the classroom and outside the classroom, develop value based lesson plans, integrating values in school subjects.
- Study of any Model of integrated value education – case study of models expressed by Sri Sathya Sai, J. Krishnamurti, etc.
- Visit to Ramakrishna Institute of Moral and spiritual Education

In addition, school and community based activities may be organised.

Evaluation Strategies

1. Reflective reading based presentations.
2. Unit tests.
3. Quiz based evaluation
4. Seminar presentation
5. Submission of case reports on violation of peace as reported through mass-media.

References:

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4. Galtung, Johan (1996). Peace by Peaceful Means: Peace and Conflict, Development and Civilization. Sage Publications, New Delhi.
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17. Sri Sathya Sai International Center for Human Values (2009). Education in Human Values: Course Book for Training of Master Trainers, New Delhi.
18. The Curriculum framework for Quality Teacher Education (1998) NCTE, New Delhi
19. UNESCO (2001) Learning the way of Peace, "A Teacher Guide to Education for Peace", UNESCO, New Delhi.

Web resources

Education for values in schools- a framework, NCERT
http://www.ncert.nic.in/pdf_files/Framework_educationCOMPLETEBOOK.pdf

Values Education A Handbook for Teachers (2012), CBSE
http://cbseacademic.in/web_material/ValueEdu/Value%20Education%20Kits.pdf
Position Paper National Focus Group on Education for Peace, NCERT
http://www.ncert.nic.in/new_ncert/ncert/rightside/links/pdf/focus_group/education_for_peace.pdf

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UNIVERSITY OF MYSORE

REGIONAL INSTITUTE OF EDUCATION
[National Council of Educational Research and Training, New Delhi]

Regulations governing the Programme

1.0 Programme and Duration :

Integrated Programme of Teacher Education titled **'Bachelor of Science and Education' (B.Sc.B.Ed.)** degree programme. The programme will be of four year duration organized on the semester pattern with 2 semesters in a year. Each semester will consist of a minimum of 16 weeks of instruction excluding examination.

1.1 Equivalence:

The course contents related to Physics/ Chemistry/ Mathematics/ Botany/ Zoology offered in the Programme are equivalent to the courses offered in the
B.Sc. (PCM/CBZ) Programme recommended by the UGC (2015) and the University of Mysore.

The Course contents of the professional education component are equivalent to that of B.Ed. of University of Mysore and are in accordance with the norms and regulations for the B.Sc.B.Ed. Programme as prescribed by the NCTE (2014). This degree B.Sc.B.Ed. is thereby equivalent to B.Sc. degree of the University of Mysore and the UGC and the B.Ed. degree of the University of Mysore and the NCTE.

On successful completion of the programme, students are eligible for admission to Master Degree Programmes in respective subjects in the University of Mysore and other Indian/Foreign Universities.

2.0 Eligibility for admission to B.Sc.B.Ed.

2.1 Candidates seeking admission to the programme should have passed CBSE Senior Secondary examination/ Pre-University examination of Karnataka or an equivalent examination of Kerala, Andhra Pradesh, Tamil Nadu, Telangana or the UT of Lakshadweep/Puducherry with 45% marks in the aggregate. Relaxation up to 5% of marks is given to the SC/ST candidates.

2.2 Candidates should have passed the qualifying examination with the following combinations of subjects. For admission to the PCM stream : Physics, Chemistry, Mathematics/Statistics; For admission to CBZ stream : Physics, Chemistry, Mathematics, Biology or Biotechnology; Physics, Chemistry, Biology / Chemistry, Botany and Zoology.

2.3 Admission shall be made by selection on the basis of marks in the qualifying examination and performance in a specially designed national level test (Common Entrance Examination) conducted by the NCERT. It shall be governed by the admission policies of NCERT and the guidelines of the University of Mysore.

Admission will be in accordance with administrative policies related to proportionate representation (based on the latest available census report) to different States in the region. It will also be governed by the reservation policies of Govt. of India as prevalent at the time of admission.

3.0 Scheme of Instruction :

Details of courses and scheme of study, duration, etc. are provided in Table 1.

Courses of Study are organized under the following captions :

a) Core Courses
b) Ability Enhancement Courses
c) Discipline Specific Electives
d) Skill Enhancement Courses
e) Generic Courses
f) Professional Education Courses.

3.1 **Core Courses:**

The Programme offers two streams. Each stream has 3 majors – PCM and CBZ. Each Major comprises of 6 core courses. The titles of courses in each major and their positions are given in Table 10.

3.2 **Ability Enhancement Courses :**

This is mandatory for all students. It comprises of 4 courses, two each in a language of student's choice and two in English.

a) Language: Any one of the following: Kannada/ Hindi / Tamil /Telugu / Malayalam.
b) English

3.3 **Discipline Specific Elective:**

Total of six courses, two in each Major Subject are offered in the VII and VIII semesters of the Programme.

3.4 **Skill Enhancement Course:**

Two courses are offered in the third and fourth semesters of the Programme. Students can choose any two courses of their choice, cutting across disciplines, from a pool of courses that are being offered in each subject area.

3.5**. Generic Course:**

Two courses of inter-disciplinary nature are offered in the first and eighth semester of the programme.

3.6 **Professional Education Courses:**

In accordance with the NCTE regulations – 2014, the programme includes 23 courses which are positioned throughout the 8 semesters. The requirements of the 16 week internship proposed by the NCTE, are met through three rigorous phases of School Attachment Programmes. The first two Phases are of 2 week duration each which will be organized in the Demonstration School and selected schools in Mysore. The longer duration, 10 weeks organized in the third phase of School Attachment Programme, is primarily an internship in teaching Programme which will be organized in selected schools of NVS, Hyderabad Region or other schools.

4.0 Attendance

Each student has to attend a minimum of 75% of the classes conducted in each course. Failure to meet the minimum requirement renders disqualification from terminal

examination and makes him/her ineligible for NCERT scholarship/ free ship. Such a student is deemed to have dropped the course and is not allowed to write the semester end examination of that course. He has to re-register for the course/s as and when they are offered by the institute.

5.0 Medium of Instruction:

The medium of instruction and examination is English.

6.0 Course Structure

TABLE 1: CREDIT BREAK-UP INTO B.SC. AND B.ED. COMPONENTS AND MODE OF EVALUATION

Semester	Total Credits	Programme	Credits (Theory) (L)	Teaching hours per week (L)	Credits: Practicum/al (Lab/Field) (T/P)	Practicum/al Hours per week (T/P)	Total Hours per week (L+T+P)	Assessment C1+C2	Terminal Assessment C3)
I	24	B.Sc.	13	13	5	10	23	50	50
		B.Ed.	4	4	2	4	8	50	50
II	24	B.Sc.	13	13	5	10	23	50	50
		B.Ed.	4	4	2	4	8	50	50
III	23	B.Sc.	11	11	4	8	19	50	50
		B.Ed.	4	4	4	8	12	50	50
IV	23	B.Sc.	11	11	4	8	19	50	50
		B.Ed.	4	4	4	8	12	50	50
V	24	B.Sc.	9	9	3	6	15	50	50
		B.Ed.	7	7	5	10	17	50	50
VI	24	B.Sc.	9	9	3	6	15	50	50
		B.Ed.	6	6	6	12	18	50	50
VII	17 12*	B.Sc.	3	3	6	12	15	50	50
		B.Ed.	4	4	16**	8	8	50	50
VIII	21	B.Sc.	5	5	6	12	17	50	50
		B.Ed.	6	6	4	8	14	50	50
Total	**192**		**113**	**113**	**79**	**134**	**247**		

*internship

** includes internship credits

Tables 2 to 9: Detailed Course Structure for B.Sc.B.Ed.

Total Credits = 192; B. Sc. Component = 112; B.Ed. Component = 80

TABLE 2: Semester I (Credits: B.Sc.12; AEC 6; B.Ed. 6; Total 24)

Course No.	Total Credits	Courses	Credits Theory (L)	Teaching Hours per week (L)	Credits: Practicum/al (Lab/Field) (T/P)	Practicum/al Hours per week (T/P)	Total Hours per week (L+T+P)	Periodic Assessment C1+C2	Terminal Assessment C3
1	4	Core Course1A Physics/Botany	3	3	1	2	5	50%	50%
2	4	Core Course 2A Chemistry	3	3	1	2	5	50%	50%
3	4	Core Course 3A Mathematics/ Zoology	3	3	1	2	5	50%	50%
4	3	AEC 1A Lang H/K/M/Tam/Tel	2	2	1	2	4	50%	50%
5	3	AEC 2A English	2	2	1	2	4	50%	50%
6	2	GE - Environmental Education	1	1	1	2	3	50%	50%
7	4	Language across the curriculum	3	3	1	2	5	50%	50%
Total	**24**		**17**	**17**	**7**	**14**	**31**	**50%**	**50%**

Note:
1A, 2A & 3A – Numerals refer to the majors , and A refers to the First course in each major.
From Sem II to VI, papers in core courses are designated B, C, D, E & F
AEC – Ability Enhancement Course
GE- Generic Elective of Inter-disciplinary nature

TABLE 3 : Semester II (Credits: B.Sc. 12; AEC 6; B.Ed. 6; Total 24)

Course No.	Total Credits	Courses	Credits Theory (L)	Teaching Hours per week (L)	Credits: Practicum/al (Lab/Field) (T/P)	Practicum/al Hours per week (T/P)	Total Hours per week (L+T+P)	Periodic Assessment C1+C2	Terminal Assessment C3
1	4	Core Course 1B Physics/ Botany	3	3	1	2	5	50%	50%
2	4	Core Course 2B Chemistry	3	3	1	2	5	50%	50%
3	4	Core Course 3B Mathematics/ Zoology	3	3	1	2	5	50%	50%
4	3	AEC 1B Lang – H/K /M/ Tam/Tel	2	2	1	2	4	50%	50%
5	3	AEC 2B English	2	2	1	2	4	50%	50%
6	4	Contemporary Indian Education	3	3	1	2	5	50%	50%
7	2	Yoga Edu., self-understanding & development	1	1	1	2	3	50%	50%
Total	24		17	17	7	14	31		

TABLE 4: Semester III (Credits: B.Sc. 12; SEC 3; B.Ed. 8; Total 23)

Course No.	Total Credits	Courses	Credits Theory (L)	Teaching Hours per week (L)	Credits: Practicum/al (Lab/Field) (T/P)	Practicum/al Hours per week (T/P)	Total Hours per week (L+T+P)	Periodic Assessment C1+C2	Terminal Assessment C3
1	4	Core Course 1C Physics/Botany	3	3	1	2	5	50%	50%
2	4	Core Course 2C Chemistry	3	3	1	2	5	50%	50%
3	4	Core Course 3C Mathematics/ Zoology	3	3	1	2	5	50%	50%
4	3	*Skill Enhancement Course 1	2	2	1	2	4	50%	50%
5	4	Childhood & Growing up	3	3	1	2	5	50%	50%
6	2	Gender School & Society	1	1	1	2	3	50%	50%
7	2	School Attachment Programme 1	0	0	2	0	3 weeks	50%	50%
Total	23		15	15	8	16	31		

*** SEC 1 - Skill Enhancement Course 1 –** Each student will select any one of the 5 courses offered.

TABLE 5 : Semester IV (Credits: B.Sc.12; SEC 3; B.Ed. 8; Total 23)

Course No.	Total Credits	Courses	Credits Theory (L)	Teaching Hours per week (L)	Credits: Practicum/ al (Lab/Field) (T/P)	Practicum/ al Hours per week (T/P)	Total Hours per week (L+T+P)	Periodic Assessmen t C1+C2	Terminal Assessmet C3
1	4	CoreCourse1D Physics/Botany	3	3	1	2	5	50%	50%
2	4	Core Course 2D Chemistry	3	3	1	2	5	50%	50%
3	4	Core Course 3D Mathematics/ Zoology	3	3	1	2	5	50%	50%
4	3	*Skill Enhancement Course 2	2	2	1	2	4	50%	50%
5	4	Learning & Teaching	3	3	1	2	5	50%	50%
6	2	Drama & Art Education	1	1	1	2	3	50%	50%
7	2	School Attachment Programme 2	0	0	2	3 weeks	4	50%	50%
Total	23		15	15	8	16	31		

*** SEC 2 - Skill Enhancement Course 2 –** Each student will select any one of the 5 courses offered.

TABLE 6: Semester V (Credits: B.Sc. 12; B.Ed. 12; Total 24)

Course No.	Total Credits	Courses	Credits Theory (L)	Teaching Hours per week (L)	Credits: Practicum/al (Lab/Field) (T/P)	Practicum/al Hours per week (T/P)	Total Hours per week (L+T+P)	Periodic Assessment C1+C2	Terminal Assessment C3
1	4	Core Course 1E Physics/Botany	3	3	1	2	5	50%	50%
2	4	Core Course 2E Chemistry	3	3	1	2	5	50%	50%
3	4	Core Course 3E Mathematics/ Zoology	3	3	1	2	5	50%	50%
4	4	Assessment For Learning	3	3	1	2	5	50%	50%
5	4	Pedagogy of Physical Sciences	2	2	2	4	6	50%	50%
6	4	Pedagogy of Maths/Biol. Sci.	2	2	2	4	6	50%	50%
Total	24		16	16	8	16	32		

TABLE 7: Semester VI (Credits: B.Sc. 12; B.Ed. 12; Total 24)

Course No.	Total Credits	Courses	Theory (L)	Teaching Hours per week (L)	Credits: Practicum/al (Lab/Field) (T/P)	Practicum/al Hours per week (T/P)	Total Hours per week (L+T+P)	Periodic Assessment C1+C2	Terminal Assessment C3
1	4	CoreCourse1F Physics/Botany	3	3	1	2	5	50%	50%
2	4	Core Course2F Chemistry	3	3	1	2	5	50%	50%
3	4	Core Course 3F Mathematics/ Zoology	3	3	1	2	5	50%	50%
4	4	Critical Under-standing Of ICT	2	2	2	4	6	50%	50%
5	4	Pedagogy of Physical Sciences	2	2	2	4	6	50%	50%
6	4	Pedagogy of Maths/Biol. Sci.	2	2	2	4	6	50%	50%
Total	**24**		**15**	**15**	**9**	**18**	**33**		

TABLE 8: Semester VII* (Credits: DSE 9; B.Ed. 20; Total 29**)

Course No.	Total Credits	Courses	Credits Theory (L)	Teaching Hours per week (L)	Credits: Practicum/al (Lab/Field) (T/P)	Practicum/al Hours per week (T/P)	Total Hours per week (L+T+P)	Periodic Assessment C1+C2	Terminal Assessment C3
1	3	DSE 1 A Physics/Botany	1	1	1+1	2+2	5	50%	50%
2	3	DSE 2 A Chemistry	1	1	1+1	2+2	5	50%	50%
3	3	DSE 3 A Mathematics/ Zoology	1	1	2/1+1	4/2+2	5	50%	50%
4	4	Creating an incl. school	2	2	2	4	6	50%	50%
5	2	Health & Physical Education	1	1	1	2	3	50%	50%
6	2	Reading & Reflections on text	1	1	1	2	3	50%	50%
7*	6	Internship in School Subject 1 : Physical Science	0	0	6	0	10 weeks	50%	50%
	6	Internship in School Subject 2 : Mathematics/ Biological Science	0	0	6	0		50%	50%
Total	**29**		**7**	**7**	**22**	**20**	**27**		

*****Semester duration 24 weeks; Instructional duration -14 weeks; Engagement in field -10 weeks

**includes Internship 12 credits.

TABLE 9: Semester VIII (Credits: DSE 9; GE 2; B.Ed. 10; Total 21)

Course No.	Total Credits	Courses	Theory (L)	Teaching Hours per week (L)	Credits: Practicum/al (Lab/Field) (T/P)	Practicum/al Hours per week (T/P)	Total Hours per week (L+T+P)	Periodic Assessment C1+C2	Terminal Assessment C3
1	3	DSE 1 B Physics/Botany	1	1	1+1	2+2	5	50%	50%
2	3	DSE 2 B Chemistry	1	1	1+1	2+2	5	50%	50%
3	3	DSE 3 B Mathematics/ Zoology	1	1	2/1+1	4/2+2	5	50%	50%
4	2	GE 2 Indian Const. & Human Rights	2	2	0	0	2	50%	50%
4	4	Knowledge & Curriculum	2	2	2	4	6	50%	50%
5	4	Guidance & Counseling	3	3	1	2	5	50%	50%
6	2	Value & Peace Education	1	1	1	2	3	50%	50%
Total	**21**		**11**	**11**	**10**	**20**	**31**		

TABLE 10: PANORAMA OF COURSES IN THE EIGHT-SEMESTERS

Sl.No.	COURSE	CREDITS (L+T+P)								Credits	Total Credits In Prog.	Total Contact Hours per week (×16)
		I	II	III	IV	V	VI	VII	VIII			
	CORE COURSES:											
1	Physics/Botany	3+0+1	3+0+1	3+0+1	3+0+1	3+0+1	3+0+1	--	--	18+0+6	24	30
2	Chemistry	3+0+1	3+0+1	3+0+1	3+0+1	3+0+1	3+0+1	--	--	18+0+6	24	30
3	Maths/Zoology	3+1+0 3+0+1	3+1+0 3+0+1	3+1+0 3+0+1	3+1+0 3+0+1	3+1+0 3+0+1	3+1+0 3+0+1	--	--	18+6+0 18+0+6	24	30
	ABILITY ENHANCEMENT COURSES											
1	Language H/K/M/Tam/Tel	2+1+0	2+1+0	--	--	--	--	--	--	4+2+0	6	8
2	Eng/Comm. Eng	2+1+0	2+1+0							4+2+0	6	**8**
	SKILL ENHANCEMENT COURSES											
1	Courses 1 & 2	--	--	2+0+1	2+0+1	--	--	--	--	4+0+2	6	8
	DISCIPLINE SPECIFIC ELECTIVE											
1	Physics/Botany							1+1+1	1+1+1	2+2+2	6	10
2	Chemistry							1+1+1	1+1+1	2+2+2	6	10
3	Maths/Zoology							1+1+1	1+1+1	2+2+2	**6**	**10**
	GENERIC ELECTIVE											
1	Environmental Education	1+1+0								1+1+0	2	**3**
2.	Indian Constitution & Human Rights	1+1+0								1+1+0	2	3
	PROFESSIONAL EDUCATION COURSES											
1	Language Across Curriculum	3+1+0								3+1+0	4	5
2	Contemporary Indian Education		3+1+0							3+1+0	4	5
3	Yoga Edu., self-understanding & development		1+0+1							1+-0+1	2	3
4	Childhood & Growing up			3+1+0						3+1+0	4	5
5	Gender School & Society.			1+1+0						1+1+0	2	3
6*	School Attachment Programme 1			0+0+2						0+0+2	2	4 3 wks
7	Learning & Teaching				3+1+0					3+1+0	4	5
8	Drama & Art Education				1+1+0					1+1+0	2	3
9*	School Attachment Programme 2				0+0+2					0+0+2	2	4 3 wks
10	Assessment for Learning					3+1+0				3+1+0	4	5
11	Pedagogy of Physical Science					2+2+0				2+2+0	4	6
12	Pedagogy of Maths/ Biol. Sci.					2+2+0				2+2+0	4	6
13	Critical Under-standing of ICT						2+2+0			2+2+0	4	6
14	Pedagogy of Physical Science						2+2+0			2+2+0	4	6
15	Pedagogy of Maths/ Biol. Sci.						2+2+0			2+2+0	4	6
16	Creating an inclusive school							2+2+0		2+2+0	4	6

17	Health & Physical Education							1+0+1		1+0+1	2	3
18	Reading & reflection on text							1+1+0		1+1+0	2	3
19*	Internship in School Subject 1: Physical Science							0+0+6		0+0+6	6	10 Weeks
20*	Internship in School Subject 2: Maths/ Biol. Sci							0+0+6		0+0+6	6	
21	Knowledge & Curriculum								2+2+0	2+2+0	4	6
22	Guidance & Counselling								3+1+0	3+1+0	4	5
23	Value & Peace Education								1+1+0	1+1+0	2	3

***=courses which do not have C3 Theory examination**

L : Lectures: 1 credit =1hr/week x 16 weeks
T :Tutorial: 1 credit = 2 hr/week x 16 weeks
P : Practicum/practical = 2 hr/week x 16 weeks
V: Credit value of a course is L+T+P

Note : VII Semester consists of 24 weeks out of which 10 weeks of School Attachment Programme-internship in Teaching will be organized in schools outside Mysore. 14 weeks are available for classroom instruction.

7.0 Change of Stream

Once admitted to a stream, change to another stream is not permitted under any circumstances during the Programme.

TABLE 11 : SUBJECTS AND TITLES OF COURSES IN THE PROGRAMME

SEMESTER	COURSE	CODE	SUBJECT	TITLE
FIRST	**Core course 1A**	BSE I.1A BSE I.1B	Physics/ Botany	Mechanics Diversity of Microbes
	Core Course 2A	BSE I.2	Chemistry	Atomic Structure and Bonding
	Core Course 3A	BSE I.3A BSE I.3B	Mathematics / Zoology	Calculus – I and Matrices Diversity of Animals I
	AEC 1A	BSE I.4A BSE I.4B BSE I.4C BSE I.4D BSE I.4E	Language	Hindi/ Kannada/ Malayalam / Tamil/ Telugu
	AEC 2A	BSE I.5	English	
	GE 1	BSE I.6		Environmental Education
	Professional Education	BSE I.7		Language Across Curriculum
SECOND	**Core course 1B**	BSE II.1A BSE II.1B	Physics/ Botany	Elasticity, Waves, Heat and Thermodynamics Diversity of Cryptogams and Archegoniatae
	Core Course 2B	BSE II.2	Chemistry	States of Matter and Nuclear Chemistry
	Core Course 3B	BSE II.3A BSE II.3B	Mathematics / Zoology	Calculus – II , Analytical Geometry and Number Theory Diversity of Animals II

	AEC 1B	BSE II.4A BSE II.4B BSE II.4C BSE II.4D BSE II.4E	Language	Hindi/ Kannada/ Malayalam / Tamil/ Telugu
	AEC 2B	BSE II.5	English	
	Professional Education	BSE II.6		Contemporary Indian Education
		BSE II.7		Yoga Edu., self-understanding & development
THIRD	**Core course 1C**	BSE III.1A BSE III.1B	Physics/ Botany	Electricity and Electromagnetism Gymnosperms and Reproductive Biology of Angiosperms
	Core Course 2C	BSE III.2	Chemistry	Organic Chemistry – I
	Core Course 3C	BSE III.3A BSE III.3B	Mathematics / Zoology	Real Analysis Diversity of Animals III and Comparative Anatomy
	SEC 1	BSE III.4A BSE III.4B BSE III.4C BSE III.4D BSE III.4E	Physics Botany Chemistry Mathematics Zoology	Basic Instrumentation Skills Plant Propagation, Nursery & Gardening Industrial Chemicals and Environment Combinatorics, Statistics & Basic Probability Apiculture
	Professional Education	BSE III.5		Childhood &Growing up
		BSE III.6		Gender School & Society
		BSE III.7		School Attachment Programme 1
FOURTH	**Core course 1D**	BSE IV.1A BSE IV.1B	Physics/ Botany	Optics Plant Anatomy and Ecology
	Core Course 2D	BSE IV.2	Chemistry	Thermodynamics, Equilibrium and Solutions
	Core Course 3D	BSE IV.3A BSE IV.3B	Mathematics / Zoology	Differential Equations Ecology, Biogeography & Evolution
	SEC 2	BSE IV.4A BSE IV.4B BSE IV.4C BSE IV.4D BSE IV.4E	Physics Botany Chemistry Mathematics Zoology	Computational Physics Utilisation of Plants & Herbal Technology Industrial Inorganic Materials Data Handling Sericulture
	Professional Education	BSE IV.5		Learning & Teaching
		BSE IV.6		Drama & Art Education
		BSE IV.7		School Attachment Programme 2
FIFTH	**Core course 1E**	BSE V.1A BSE V.1B	Physics/ Botany	Atomic and Molecular Physics Botanical Nomenclature, Angiosperm Taxonomy and Utilization of Plants
	Core Course 2E	BSE V.2	Chemistry	Transition Elements, Coordination Compounds and Chemical Kinetics
	Core Course 3E	BSE V.3A	Mathematics /	Multivariate Calculus and Vector

		BSE V.3B	Zoology	Calculus Development Biology, Applied Zoology & Ethology
	Professional Education	BSE V.4		Assessment For Learning
		BSE V.5		Pedagogy of Physical Science 1
		BSE V.6A BSE V.6B		Pedagogy of Mathematics 1 Pedagogy of Biological Science 1
SIXTH	**Core course 1F**	BSE VI.1A BSE VI.1B	Physics/ Botany	Classical and Quantum Mechanics and Special Theory of Relativity Plant Physiology and Metabolism
	Core Course 2F	BSE VI.2	Chemistry	Organic Chemistry II
	Core Course 3F	BSE VI.3A BSE VI.3B	Mathematics / Zoology	Groups and Rings Animal Physiology, Endocrinology & Immunology
	Professional Education	BSE VI.4		Critical Understanding of ICT
		BSE VI.5		Pedagogy of Physical Science 2
		BSE VI.6A BSE VI.6B		Pedagogy of Mathematics 2 Pedagogy of Biological Science 2
SEVENTH	**Discipline Specific Elective 1**	BSE VII.1A BSE VII.1B	Physics Botany	Nuclear and Particle Physics Cell Biology, Genetics and Evolution
		BSE VII.2	Chemistry	Electrochemistry and Photochemistry
		BSE VII.3A BSE VII.3B	Mathematics / Zoology	Linear Algebra Cell Biology and Genetics
	Professional Education	BSE VII.4		Creating an inclusive school
		BSE VII.5		Health & Physical Education
		BSE VII.6		Reading & reflection on text
		BSE VII.7A		Internshipin School Subject 1 : Physical Science
		BSE VII.7B/ BSE VII.7C		Internship in School Subject 2: Mathematics/Biological Science
EIGHTH	**Discipline Specific Elective 2**	BSE VIII.1A BSE VIII.1B	Physics Botany	Solid State Physics Molecular Biology, Biochemistry and Biotechnology
		BSE VIII.2	Chemistry	Spectroscopy, Natural Products and Heterocyclics
		BSE VIII.3A BSE VIII.3B	Mathematics / Zoology	Complex Analysis and Numerical Analysis Biochemistry, Molecular Biology and Biotechnology
	Generic Elective 2	BSE VIII.4		Indian Constitution and Human Rights
	Professional Education	BSE VIII.5		Knowledge &Curriculum
		BSE VIII.6		Guidance & Counselling
		BSE VIII.7		Value & Peace Education

8.0 Scheme of Examination

8.1 There shall be a terminal (C3) Examination conducted by the University of Mysore at the end of each semester in Theory and/or Practical as the case may be.

8.2 Detailed Scheme of Examination along with breakup of C1, C2 and C3 marks is given below.

- ❖ All the courses will be evaluated for a total of 100 marks in the C1, C2 and C3 pattern.
- ❖ C1= 25; C2 = 25 and C3 = 50 will be followed uniformly for all the courses.
- ❖ In Courses with both theory and practicals, C3 Theory = 50 & C3 Practical = 50
- ❖ Courses without a C3 theory are separately indicated in the table

8.3 Duration of semester end examination (C3) for all theory courses will be 2 hours and for practical examination, it is 3 hours.
Each theory paper comprises of 5 questions of 10 marks each with internal choice covering the entire syllabus. There shall be two questions from each unit in serial order with internal Choice. Question 9 will consist of objective type questions drawn from all the units.

9.0 Question paper setting, valuation, declaration of results, challenge valuation and all other examination related issues will be as per the rules and procedures followed by the University of Mysore.

9.1 **Question paper setting for C_3.**

(i) There shall be a separate Board of Examiners for each subject approved by the University, for preparing, scrutinizing and approving the question papers and scheme of valuation for use in the examination/s.

(ii) The question papers shall be drawn from the question bank, through a computer.

9.2 **Coding of Answer Scripts**:
Before valuation, the answer scripts shall be coded using false numbers. For each paper code, separate false number shall be given.

9.3 **Valuation and Classification of Successful Candidates**
All papers including practicals will be valued by an internal examiner and there will be single valuation.
The performance of a student in a course will be assessed for a maximum of 100 marks as explained below.
A semester is divided into three discrete components namely C_1, C_2 and C_3.
The evaluation of the first component C_1 will be done during the first half of the semester after completing the I and II units of the syllabus. This will also have a weightage of 25%. This will be consolidated during the 8^{th} week of the semester.
The evaluation of the second component C_2 will be done during the second half of the semester when units III and IV of the syllabus are completed. This will also have a weightage of 25%. This will be consolidated during the 16^{th} week of the semester.
In general C_1, and C_2 should be evaluated through Test/Seminar/ Dissertation/ Presentation/Assignment.
Between the 18^{th} and 20^{th} week of the semester, the semester end examination will be conducted by the University and this forms the third component of evaluation, C_3 with weightage of 50%.
If a candidate has not scored at-least 30% in C_1 and C_2 put together, he/she is **not allowed** to appear for C_3.
It should be noted that evaluated papers/assignments of C_1 and C_2 assessment are immediately returned to the candidates after obtaining acknowledgement in the register maintained by the concerned teacher for this purpose.
For courses that have both Theory and Practical components, as part of C_3, both theory and practical examinations shall be conducted for 50 marks each.

The final marks of a course, **M of C_3**, will be computed as per the following table :

	Credit Distribution patterns	Formula for calculating M
1.	L : T : P	M = ((L+T)*X+ (P*Y)) / (L+T+P))
2.	L : T : P = 0	X
3.	L : T = 0 : P	(L*X + P*Y) / (L+P)
4.	L = 0 : T : P	Y
5.	L : T = 0 : P = 0	X
6.	L = 0 : T = 0 : P	Y
7.	L = 0 : T : P = 0	Z

Where,
X is the marks scored out of 50 in C_3 in Theory
Y is the marks scored out of 50 in C_3 in Practical
Z is the marks scored out of 50 in C_3 in Tutorial

The total marks in a course is $P = C_1 + C_2 + M$ (after rounding to nearest integer). The grade (G) and grade point (GP) will be calculated as follows where V is the credit value of the course.

P	G	GP = V × G
90 – 100	10	V × 10
80 – 89	9	V × 9
70 – 79	8	V × 8
60 – 69	7	V× 7
50 – 59	6	V × 6
40 – 49	5	V × 5
30 – 39	4	V ×4
0 -29	0	V × 0

If a candidate's score is **$C_1 + C_2 \geq 30\%$, M $\geq$ 30%M and G $\geq$ 5** in a course, then he is considered to be successful in that course.

After successful completion of the required number of credits, then the overall cumulative grade point average (CGPA) of a candidate is calculated using the formula CGPA = ΣGP / Total number of credits and the class is declared as follows :

	FGP	
CGPA	Numerical Index	Qualitative Index
4 ≤ CGPA < 5	5	Second Class
5 ≤ CGPA < 6	6	
6 ≤ CGPA < 7	7	First Class
7 ≤ CGPA < 8	8	
8 ≤ CGPA < 9	9	Distinction
9 ≤ CGPA≤ 10	10	

Overall percentage = 10 * CGPA or is said to be 50% in case CGPA < 5.

However, if **$C_1 + C_2 \geq 30\%$, $M \geq 30\%$ and with grade G = 4,** then a candidate has three options namely conditional success or make up of a course or dropping a course.

9.4 **Conditional Success**: A candidate is said to be successful conditionally in a course if his score in $C_1 + C_2 \geq 30\%$, $M \geq 30\%$ and grade G = 4. But this benefit will be available upto a maximum 32 credits for the entire programme of B.Sc.B.Ed. of 4 years. The candidate has to exercise this option within 10 days from the date of notification of results.

9.5 **Make Up of a Course**: Under the following circumstances, a candidate can have option to choose MAKE-UP OPTION for C_3:

1. scores $\geq 30\%$ in $C_1 + C_2$ and $M < 30\%$
2. scores $\geq 30\%$ in $C_1 + C_2$; $M \geq 30\%$ but with grade G = 4

The candidate has to exercise this option within 10 days from the date of notification of results. Once he has chosen the option he has to write the examination which will be conducted within 25 days from the date of notification of results or as directed by the University. There can be two or more examinations on the same day and they may be held on Saturdays and Sundays also.

If the candidate is unsuccessful in make up, also then he/she is deemed to have withdrawn/ dropped the course.

9.5 **Dropping a Course**

Under the following circumstances a candidate is said to have DROPPED a course,

If the candidate :

1. fails to put in 75% attendance in a course,
2. decides to discontinue/ withdraw from the course,
3. scores less than 30% in $C_1 + C_2$ together,
4. scores in
   i) $C_1 + C_2$ is $\geq 30\%$ and $M < 30\%$ or
   ii) $C_1 + C_2$ is $\geq 30\%$, $M \geq 30\%$ and Grade G = 4 and exercises option to drop the course within 10 days from the date of notification of final results is unsuccessful in the MAKE-UP examination.

A candidate who has dropped a course has to **re-register** for the course when the course is offered again by the Institute.

9.6. Each student can go with a normal pace of 24 credits per semester. However, he/she has provision to go with a slow pace of 20 credits per semester and an accelerated pace of 28 credits per semester. In any case it should not exceed 28 credits including re-registered courses.

9.7. The tuition fee and the examination fee of a semester will be in accordance with the number of credits registered by each student in that semester.

9.8 The student may avail a maximum of two blank semesters in one stretch. However, he has to pay a nominal fee for maintaining a semester blank to the institution.

10.0 Provision for Appeal

A candidate, if dissatisfied with the grades that he/she has got with a feeling that he/she is unnecessarily penalized can approach the grievance cell with the written

submission together with all facts and all the assignments, test papers etc. which were evaluated. He/She can do so before the semester-end examination (based on 2 continuous assessment components already completed) or after the semester-end examination. The grievance cell is empowered to review the grades if the case is genuine and is also empowered to penalize the candidate if his/her submission is found to be baseless and unduly motivated. This Cell may recommend to take disciplinary/corrective action on an evaluator if he/she is found guilty. The decision taken by the Grievance Cell is final.

The Registrar (Evaluation) will be the Chairman of the Grievance Cell. The composition of the Grievance Cell is as follows:

1. The Registrar (Evaluation) *ex-officio* Chairman/Convenor.
2. The Principal
3. Dean of instructions
4. Heads of DESM, DESSH and I/c Sections. An external expert from the University of Mysore in the concerned subject.
5. Additional lady faculty member (in case not covered by 1,2,3,4,6 and 7).
6. Additional faculty member from a minority community (in case not covered by 1,2,3,4,5 and 7) and

The appropriate fee as fixed by the University shall be collected from the candidate who goes for an appeal to the Grievance Cell.

11.0 Marks Cards:

11.1 The marks card shall be laminated after affixing the hologram only when a candidate passes all the courses/papers of a particular semester.

12.0 Barring of Simultaneous Study

12.1 No student admitted to a degree course in a college under the jurisdiction of this university, shall be permitted to study simultaneously in any other course leading to a degree (regular/evening/morning) offered by this/any other university.

12.2 If a candidate gets admitted to more than one course, the university shall without giving prior notice cancel his/her admission to all the courses to which he/she has joined.

13.0 Miscellaneous:

13.1 These revised regulations will apply to the candidates admitted for the academic year 2016-17 and onwards for the courses mentioned in Regulation No.1.0 above.

13.2 Other regulations not specifically mentioned above are as per the Regulations of the University as applicable from time to time.

13.3 Any other issue not envisaged above, shall be resolved by the Vice-Chancellor in consultation with the appropriate Bodies of the University, which shall be final and binding.

SYLLABUS

FIRST SEMESTER

Core course 1A: Physics

BSE I.1 A : MECHANICS

Credits: 4 (3L+ 0T +1P) **Marks: 100**
Contact hrs per week: 5 **C1 + C2: 50**
Exam Duration: 2 hrs **C3: 50**

Objectives:

- The students will be able to understand Newtonian mechanics and apply its principles to explain natural physical phenomena.
- The teacher will be able to enable the students to identify and modify alternative conceptions in the domains of Newtonian Mechanics.

COURSE CONTENT:

Unit I

Vectors: Vector and scalar products. Scalar triple product and Vector triple product. Differentiation of a vector with respect to scalars (such as time). Gradient, Divergence, Curl-definitions, physical meaning, and operations, Laplacian, Line, Surface, and Volume integrals. Gauss', Stokes, and Greens theorem.
Ordinary Differential Equations: 1^{st} order homogeneous differential equations. 2^{nd} order homogeneous differential equations with constant coefficients.

Unit II

Laws of Motion: Newton's Laws of motion. Frames of reference, inertial and non inertial, pseudo forces, Galilean transformations; Galilean invariance, Dynamics of a system of particles. Centre of Mass.
Momentum and Energy: Principle of conservation of momentum for a system of particle, Work and Kinetic Energy Theorem. Conservative and non-conservative forces. Conservation of energy. Momentum of variable-mass system: motion of rocket.

Unit III

Rotational Motion: Angular velocity and angular momentum of a particle and system of particles. Torque. Principle of conservation of angular momentum.
Gravitation: Newton's Law of Gravitation. Central force and motion of a particle in a central force field (motion is in a plane, angular momentum is conserved, areal velocity is constant). two-body central force problem and reduction to the equivalent one body problem, inverse square law potential and different forms of orbit, Kepler's laws of planetary motion. Satellite in circular orbit and applications. Geosynchronous orbits. Weightlessness.

Unit IV

Oscillations: Simple Harmonic Motion (Basic idea), Differential equation of SHM and its solutions (simple pendulum, compound pendulum, loaded spring), Kinetic and Potential Energy, Total Energy and their time averages. Linearity and Superposition Principle. (1) Oscillations having equal frequencies and (2) Oscillations having different frequencies (Beats), Lissajous figures with equal an unequal frequency and their uses. Damped vibrations. Forced vibrations.

Reference Books:

1. David Halliday, Robert Resnick and Jearl Walker, Fundamentals of Physics, 6th Edition, John Wiley and Sons Inc.
2. Harris Benson, University Physics, Revised Edition, John Wiley and Sons, Inc.
3. FW Sears, MW Zemansky and HD Young, University Physics, 1986. Addison-Wesley.
4. K. R. Symon, Mechanics, Addison Wesley, 1971.
5. Basudeb Bhattacharya,Engineering Mechanics, 2nd edn., 2015, Oxford University Press
6. Ronald Lane Reese, University Physics, 2003, Thomson Brooks/Cole
7. Y. R. G. Takwale and P. S. Puranik, Introduction to classical mechanics, Tata McGraw Hill.
8. Charles Kittel et. al., Mechanics Berkeley Physics course, 2007, Tata McGraw-Hill.
9. H C Verma, Concepts of Physics, Bharati Bhawan; Revised Reprint 2015 edition

PRACTICAL

Exam Duration : 3 hrs **C3 : 50**

Objectives:

- To provide training in the broad methodology of science through investigatory type and open-ended laboratory exercises.
- To validate the theoretical basis of the experiments.

COURSE CONTENT:

(A minimum of TEN experiments out of the following)

1. Study of the motion of an air bubble.
2. Study of the motion of a freely falling body.
3. Study of the acceleration of a body subjected to different unbalanced forces.
4. Study of accelerations of different masses under a constant unbalanced force.
5. Study of conservation of energy and momentum in head-on-collision between two spheres of equal mass.
6. Study of conservation of momentum and energy of a collision in a plane.
7. Conservation of momentum in a mechanical explosion.
8. To study the relation between length and time period of a simple pendulum.

9. To study the relation between force and extension produced in a stretched spring.
10. Study of the variation of the time period of a bar pendulum with different length and determination of 'g' at the given place.
11. Study of the dependence of the period of oscillation of a spring-mass system on mass
12. The Spiral spring: Determination of the acceleration due to gravity by the graphical method.
13. Determination of moment of Inertia, mass and density of the flywheel.
14. Moment of inertia of a disc supported on strings.
15. The moment of inertia of a wheel and axle.
16. The Bifilar Suspension

Reference Books:

1. B.L.Flint & H.T.Worsnop, Advanced Practical Physics for students, Asia Publishing House,1971.
2. E Armitage, Practical Physics, John Murray.
3. PSSC Physics Laboratory Guide.
4. S.Panigrahi & B.Mallick, Engineering Practical Physics, Cengage Learning India Pvt. Ltd., 2015
5. Indu Prakash and Ramakrishna, A Text Book of Practical Physics, 11th Edition, Kitab Mahal, New Delhi, 2011.
6. Jerry D Wilson and Cecilia A. Hernández-Hall Physics Laboratory Experiments7thEdition, Cengage Learning, 2009.

Core Course 1A - Botany

BSE I.1B : DIVERSITY OF MICROBES

Credits: 4 (3L+ 0T +1P) **Marks: 100**
Contact hrs per week: 5 **C1 + C2: 50**
Exam Duration: 2 hrs **C3: 50**

Objectives:

- To acquaint students with the diversity that exists in microorganisms;
- To understand the morphology, organization, structure, and reproduction in microbes;
- To appreciate the role and significance of microbes in human welfare and environment;
- To study the symptoms of selected diseases caused by microbes.

COURSE CONTENT:

Unit I :

a) Brief account of history, discovery, characteristics of viruses, viroid, virusoid and prions. Structure, types and reproduction of Bacteriophages.
A brief account of diseases caused by 1. Virus – yellow mosaic of bean and HIV, 2. Prions – BSE, Cruzefeldt Jacob disease, Kuru disease; d) Role of viruses in human

welfare – a brief account. Brief account of bacterial diseases of plants (Citrus Canker)

b) Brief account of history, discovery, occurrence, ultrastructure, modes of nutrition, reproduction and economic importance. Review of classification based on morphology and flagellation;

c) Role of bacteria in human welfare ; Environment – decomposition and bioremediation; Agriculture – biofertilizers (*Rhizobium*) biopesticides (*B. thuringiensis)*; Pharmaceuticals – antibiotics and probiotics; industrial – organic acids.

d) A general account of Mycoplasma (e.g. sandal spike disease) and Ricketsiae.

e) *Cyanobacteria:*

i) General account, occurrence, structure, reproduction and economic importance – nutritive value, biofertilizers (N_2 fixation, role of heterocyst), algal blooms as biological indicators.

ii) Study of *Spirulina, Nostoc* and *Oscillatoria.*

Unit II :

General account of occurrence, structure, thallus organization, reproduction, economic importance and classification (classification of Fritsch).

b) Study of the structure, reproduction and life-cycle of the following:

Chlorophyceae : *Oedogonium*, *Chara*
Phaeophyceae : *Sargassum*
Rhodhophyceae : *Polysiphonia*
Bacillariophyceae : General account, structure and reproduction of pennate diatom, economic importance.

Unit III :

General characters, thallus organization, reproduction, economic importance and classification (Alexopoulos and Mims).

a) Study of structure, reproduction, life-cycle and phytopathology and/or economic importance of the following :

Myxomycetes -*Stemonites*
Phycomycetes -*Albugo*
Ascomycetes – Yeast

Unit IV :

a) Study of structure, reproduction, life-cycle, phytopathology and economic importance of the following :

Basidiomycetes – *Puccinia*
Deuteromycetes – *Cercospora, Colletotrichum*

b) Lichens – General characters, distribution, types, structure, reproduction, economic and ecological importance.

References:

1. Smith, G.M.,1971, Cryptogamic Botany Vol.I, Algae & Fungi, TMH Publishing Co., New Delhi.
2. Sharma, O.P., 1992, Text book of Thallophytes, TMH Publishing House, New Delhi.
3. Pandey, B.P., A Text book of Algae, Sultan Chand & Co., New Delhi.
4. Sharma, P.D. 2005, The Fungi, Rastogi Publications, Meerut.
5. Singh, V., P.C.Pande & D.K.Jain, 2007, Diversity of Microbes and Cryptogams, Rastogi Publications, Meerut.

6. Singh.V., P.C.Pande & D.K.Jain, 2006. A Text book of Botany, Rastogi Publications, Meerut.
7. Kumar, H.D., A Textbook of Algae.
8. Alexopoulos.C.J. Introductory Mycology.
9. Dubey H.D. A Text book of Fungi, Bacteria and Viruses.
10. Chopra, A Class book of Fungi, S.Nagin & Co., Jullandar.

PRACTICALS

Exam Duration : 3 hrs **C_3: 50**

Objectives :

- To develop the skill of handling dissection and compound microscope.
- To develop the skill of staining and mounting microbes.
- To develop the skill of drawing and labeling microbes.
- To develop the skill of identifying the symptoms and diseases caused by microbes.
- To develop the skill of observing and identifying microbes using temporary and permanent slides.

COURSE CONTENT:

1. Gram staining of bacteria.
2. Preparation of bacterial media and culture of bacteria.
3. Study of genera included in theory under Cyanobacteria, algae and fungi by making temporary micropreparations and using permanent slides.
4. Study of crustose, foliose and fruticose lichens.
5. Observation of disease symptoms in hosts infected by virus, mycoplasma and bacteria.

Core Course 2A- Chemistry

BSE I.2 :ATOMIC STRUCTURE AND BONDING

Credits: 4 (3L+ 0T +1P) **Marks: 100**
Contact hrs per week: 5 **C1 + C2: 50**
Exam Duration: 2 hrs **C3: 50**

Objectives :

- To understand and appreciate the development of various atomic theories
- To develop an understanding of principles of Atomic structure
- To justify the need for quantum mechanical structure of atoms
- To develop an understanding of the periodic trends, preparation and uses of s- and p-block
- elements and their compounds in terms of structure and bonding
- To understand the nature of bonding and to predict the shapes of molecules
- To construct MO energy level diagrams and predict the properties of molecules

COURSE CONTENT:

Unit I: Atomic Structure

History of an atom. List the Characteristics of Black-body radiation- Planck's radiation law, photoelectric effect, Compton effect and their explanation using quantum theory. Bohr's model of hydrogen atom and its limitations. Summarise the evidence for the wave nature of matter. State de Broglie hypothesis and Heisenberg uncertainty principle.

Schrodinger wave equation and its importance, physical interpretation of the wave function, significance of ψ and ψ^2, postulates of quantum mechanics, particle in one dimensional box. Radial wave functions, angular wave functions. Quantum numbers and their importance, atomic orbitals and shapes of s, p, d orbitals , Multi-electron atoms, Aufbau and Pauli exclusion principles and Hund's multiplicity rule- Electronic configurations of the elements(s,p,d blocks), effective nuclear charge. Explanation for the stability of completely filled and half filled shells with examples. Screening effect: Slaters' rule, Energy level diagram for multi –electron atoms.

Unit II: Periodic Properties and s -and p-Block Elements

Atomic radii, Covalent radii, ionic radii and Vander waal's radii- definition with explanation with examples in a group and period Explanation of observed trwends. Comparison of the ionic size of atoms with the corresponding anion and cation. Variation of ionic radii in isoelectronic ions. Additive nature of covalent radii.
Ionization energy: Definition, the factors influencing ionization energy, variation in a group and period. Effect of the size and electronic configuration on successive ionization energies.

Electron affinity :Definition, variation in a group and in a period (observed trends in the values to be accounted for).
Electronegativity: Definition, variation in a group and in a period (observed trends in the values to be accounted for), calculation of electronegativity by Pauling and Mulliken methods.
s- and p-block elements: Comparative study of s-Block Elements, diagonal relationships, an introduction to alkyls and aryls –salient features of hydrides, Action of Liquid Ammonia , Properties of solutions of alkali metals in Liquid Ammonia, Anomalous properties of Lithium and Beryllium.
To appreciate the wide variety in Physical and Chemical characteristics of p-Block elements and their compounds. Comparative study (including diagonal relationships) of groups 13-17 elements, compounds like hydrides, oxides, oxyacids and halides of groups 13-16. tetrasulphur tetranitride, basic properties of halogens, interhalogens and polyhalides.

Unit III: Chemical Bonding - I
Chemical bond as a basis for predicting the properties which should be expected for a given chemical substance. Ionic Solids – Ionic structures, radius ratio effect and coordination number, limitation of radius ratio rule, lattice defects, semiconductors, lattice energy and Born-Haber cycle, solvation energy and solubility of ionic solids, polarizing power and polarisability of ions, Fajan's rule, Metallic bond-free electron, valence bond and band theories. Weak interactions – Hydrogen bonding, van der Waals forces. Covalent Bond –

Valence bond theory and its limitations, directional characteristics of covalent bond, various types of hybridization and shapes of simple inorganic molecules and ions. Valence shell electron pair repulsion (VSEPR) theory to NH_3, H_3O^+, SF_4, CIF_3, ICl_2, and H_2O.

Unit IV: Molecular Orbital theory, boranes and Xenon compounds

Approaches to understand the properties and stabilities of molecules as viewed by different theories of bonding. Molecular orbital theory, basic ideas – criteria for forming M.O. from A.O., construction of M.O's by LCAO – H_2^+ion, calculation of energy levels from wave functions, physical picture of bonding and antibonding wave functions, concept of σ, σ^*, π, π^* orbitals and their characteristics. Hybrid orbitals – sp, sp^2, sp^3; calculation of coefficients of A.O.s used in these hybrid orbitals. Introduction to valence bond model of H_2, comparison of M.O. and V.B. Models.
Discussion about homonuclear (He_2, N_2, O_2, F_2, C_2) and heteronuclear (CO and NO) diatomic molecules, bond Order and bond energy, percentage ionic character from dipole moment and electronegativity difference.
Hydrides of boron-diborane and higher boranes, borazine, borohydrides, fullerenes, carbides, silicates (structural principle), - Chemistry of xenon: structure and bonding in xenon compounds.

References :

1. University Chemistry : Bruce Mahan
2. Concise Inorganic Chemistry : J D Lee , fifth Edition,Wiley Publishers
3. An Introduction to Inorganic chemistry Mackay and Mackay
4. Advanced Inorganic Chemistry Satya Prakash, G.D.Tuli,S.K.Basu,R.D.Madan
5. S.Chand & Company Pvt. Ltd. Principles of Physical Chemistry Puri, Sharma, Pathania 47th Edition, Vishal Publishing Co.
6. Text book of Inorganic Chemistry P.L. Soni Sultan Chand & sons.

PRACTICAL

Exam Duration : 3 hrs **C3 : 50**

Objectives:
- To develop the concept of good lab practices including safety, glasswares handling,
- chemicals handling, chemical/glassware waste management, error analysis, note
- book maintenance
- To strengthen the concepts of mole and stoichiometry
- To develop analytical skills of volumetric technique

COURSE CONTENT :

1. Calibration and handling of balances, pipette, burette, and standard flask. Basic principles underlying the preparation of solutions, knowledge of primary and standard substances, Indicators used in titrations, their working principles range and their uses. Concept of Molarity, Normality, Molality, Equivalent weight and related calculations.

2. Stoichiometry of neutralization reactions of Sulphuric, Hydrochloric and Nitric acid using sodium hydroxide solution.
3. Preparation of standard Sodium Carbonate solution, Standardisation of Hydrochloric acid and estimation of Sodium hydroxide present in the given solution.
4. Estimation of carbonate and hydroxide present in a mixture.
5. Estimation of Carbonate and Bicarbonate in a given mixture by double indicator method.
6. Estimation of ammonium chloride in a given solution by back titration
7. Estimation of oxalic acid present in the given solution using sodium hydroxide solution and pure crystals of potassium hydrogen phthalate.
8. Estimation of Ferrous ammonium sulphate present in the given solution using potassium
   permanganate solution and pure crystals of oxalic acid.
9. Estimation of iron(II) using Potassium dichromate with internal and external indicators.
10. Estimation of ferrous and ferric ions in a given mixture using potassium dichromate solution.
11. Standardisation of Sodium thiosulphate using potassium dichromate and estimation of copper by Iodometry.
12. Estimation of Copper in the given Copper salt by Iodimetry.
13. Estimation of total hardness of water using EDTA solution and pure crystals of Zinc sulphate.

References :

1. A Text Book of Quantitative Inorganic Analysis, A I Vogel
2. Systematic Experiments in Chemistry Arun Sethi New Age International (p) Ltd. Cochin.

Core Course 3A Mathematics

BSE I.3A : CALCULUS - I AND MATRICES

Credits: 4 (3L+ 1T +0P) **Marks: 100**
Contact hrs per week: 5 **C1 + C2: 50**
Exam Duration: 2 hrs **C3: 50**

Objectives:
At the end of the course students will be able to understand and to apply the concepts, principles and techniques of calculus and matrix theory in problem solving.

COURSE CONTENT:

Unit I: Differential calculus:
Limits revisited, Continuous functions, Discontinuous functions and types. Differentiation, Linear approximation theorem, Higher derivatives, Leibnitz's theorem. Monotone functions,

Maxima and Minima, Concavity, Convexity and Points of inflection. Angle of intersection between two curves.
Differentiability theorems, Rolle's theorem, Mean Value theorems, Taylor's theorem, Maclaurin's theorem, Taylor's and Maclaurin's infinite series, Indeterminate forms.

Unit II: Integral Calculus:
The integral of a function, Techniques of integration, Integration of Rational Functions, Rationalizable Integrals.
Definite Integral, Properties, Definite integral as the limit of a sum, The fundamental theorem of Calculus, Reduction formulae, Area, Volume and Length.

Unit III: Matrices – I
Matrices of order mXn, Algebra of matrices, Symmetric and Skew Symmetric, Hermitian and Skew Hermitian matrices and their standard properties, Determinants, Adjoint of a square matrix, Singular and non-singular matrices, Rank of a matrix, Elementary row / column operations, Invariance of rank under elementary operations, Inverse of a non-singular matrix by elementary operations.

Unit IV : Matrices - II
System of m-linear equations in n-unknowns, Matrices associated with linear equations, Trivial and non-trivial solutions, Criterion for existence of non-trivial solution of homogeneous and non-homogeneous systems and their uniqueness.
Characteristic equation of a square matrix, Eigen values and Eigen vectors, Finding them for a real symmetric matrix, Diagonalization of a real symmetric matrix, Cayley – Hamilton theorem and its applications.

References :

1. Calculus by Anton, Addison-Wiley.
2. First Course in Calculus, Serge Lang, Addison-Wiley
3. Calculus by Lipman Bers, Vols. 1 and 2, IBH.
4. Advanced Calculus, Frank Ayres, Schaum Publishing Co.
5. Higher Algebra by Bamard and Child, MacMillan India Ltd.
6. Integral Calculus by Shanthinarayan, S.Chand and Co.Ltd.
7. Differential Calculus by Gorakhprasad, Pothishala Ltd.
8. Calculus and Analytical Geometry by Thomas – Finney, Narosa Publishing House.
9. Algebra by Natarajan, Manicavachagon Pillay and Ganapathy, S. Vishwanath Pvt. Ltd.
10. Matrices by Frank Ayres, Schaum Publishing Co.
11. Textbook of Matrix Algebra by Suddhendu Biswas.

Core Course 3A Zoology

BSE I.3 B : ANIMAL DIVERSITY–I

Credits: 4 (3L+ 0T +1P) **Marks: 100**
Contact hrs per week: 5 **C1 + C2: 50**
Exam Duration: 2 hrs **C3: 50**

Objectives:

- To acquaint students with the diversity that exists in invertebrates
- To enable students to understand invertebrates, their organizational hierarchies and complexities;
- To understand the external morphology and internal structure; identification and classification with examples;
- To enable them to understand various modes of adaptations in animals

COURSE CONTENT:

Unit I: Animal Classification And Protozoa

a) **Principles of classification:** Binomial nomenclature and outline classification of animal kingdom ; Body organization in animals (different grades of organization, coelom)

b) **Protozoa:** General characters and classification of Phylum, Protozoa up to classes with examples ; Nutrition in Protozoa – Holozoic, holophytic, saprozoic and parasitic nutrition; Locomotion in Protozoa – Locomotor organelles, types and mechanisms of movement; Reproduction in Protozoa: Asexual – fission, budding, sporulation; Sexual – conjugation; Life cycle of *Plasmodium* and *Entamoeba*

Unit II: Porifera

a) **Porifera:** General characters and classification of Phylum, Porifera up to classes with examples; Type study: *Sycon* – External morphology and cellular organization; Skeletal system in sponges; Canal system – Ascon, sycon and leucon types; Reproduction in sponges: Budding, gemmule, Amphiblastula and Parenchymula larvae; Affinities and systematic position in sponges.

b) **Acnidaria (Ctenophora):** General characters and classification of Phylum, Acnidaria up to classes with examples; External morphology of *Pleurobrachia*, Affinities of Acnidaria.

Unit III: CNIDARIA, ACNIDARIA AND PLATYHELMINTHES

c) **Cnidaria:** General characters and classification of Phylum, Cnidaria up to classes with examples; Type study: *Obelia* – External morphology; life cycle (with reference to metagenesis); Mesenteries in Metridium (1); Polymorphism in Cnidaria; Corals and coral reefs, their types, formation, theories and importance.

d) **Platyhelminthes:** General characters and classification of Phylum, Platyhelminthes up to classes with examples; Type study: *Taenia solium* – External morphology, proglottid, excretion, reproduction, life cycle and pathogenicity.

UNIT IV: NEMATHELMINTHES AND ANNELIDA

a) Nemathelminthes: General characters and classification of Phylum, Nemathelminthes up to classes with examples; External morphology, life-cycle and pathogenicity of *Wucheraria bancrofti*; Mode of infection and pathogenicity of i) *Ancylostoma duodenale*, ii) *Enterobius*; Parasitic adaptations in Helminthes.

b) Annelida: General characters and classification of Phylum, Annelida up to classes with examples; Type study: *Hirudinaria*– External morphology, locomotion, digestive system, reproductive system, life-history; Comparative study of a) digestive system, b) nephredia in *Pheretima, Nereis* and *Hirudinaria*; Trochopore larva, metamerism and pseudometamerism.

References:

1. Modern Textbook of Zoology Invertebrates by R.L. Kotpal – (Rastogi Publications, Meerut, 10th Revised Edition).
2. Invertebrate Zoology series (Protozoa to Echinodermata) by R.L. Kotpal – (Rastogi Publications, Meerut).
3. Invertebrate Zoology by E.L.Jordon and P.S. Verma – S. Chand & Co., Delhi).
4. Invertebrate Zoology by J.K. Dhami and P.S. Dhami – S. Chand & Co., Delhi).
5. A Textbook of Invertebrate Zoology by S.N. Prasad – (KitabMahal, Allahabad).
6. Life of Invertebrates by Russel and Hunter – (Macmillan)
7. Invertebrate Zoology by R.D. Barnes – (W.B.Saunders, Philadelphia)
8. A manual of Zoology, Vol.1 by Ekambernatha Ayyar (Vishwanathan, Madras).
9. The invertebrate series of L.H.Hyman – (McGraw Hill)
10. A student's textbook of Zoology by Adam Sedgwick Vol. I, II & III – (Central Book Depot, Allahabad).
11. A Text book of Zoology vol.1 by Parkar and Haswell – (Macmillan)

PRACTICALS

Exam Duration : 3 hrs **C3 : 50**

OBJECTIVES:

To develop in students the skills of:

- Staining and mounting of materials (temporary and permanent);
- Preparation of cultures of invertebrates by using common culture methods;
- Laboratory observation of animal specimens

COURSE CONTENT:

1. Study of microscopes: Simple and compound, handling of microscopes, use of Micro-image projection system.
2. Study of permanent slides of Protozoa:
   a) Euglena b) Plasmodium c) Opalina d) Entamoeba e) Foramenifera
   f) *Paramoecium* g)*Paramoecium* conjugation

3. Preparation of permanent and stained slides:
a)Sponge spicules b) Sponge gemmules
4. Study of specimens and permanent slides of Poriferans:
a) *Sycon*, b) *Spongilla*, c) *Euplectella*, d) *Euspongia*
5. Study of specimens and permanent slides of Cnidaria (Hydrozoa and Scyphozoa): a) *Obelia* medusa, b*) Obelia* colony c) *Physalia, d) Aurelia*
e) *Porpita*
6. Study of specimens of Cnidaria (Anthozoa):
a) Madrepora, b) Meandrina, c) Gorgonia d) T. S. of *Metridium*
7. Study of specimens of Platyhelminthes:
a)Dugesia, b) Fasciola, c) Taenia solium,
8. Study of specimens of Nematodes:
a) Wuchereria, b) Enterobius, c) Ancylostoma, d) Ascaris
9. Study of specimens and permanent slides of Annelida*:*
a) Nereis, b) Heteronereis, c) Aphrodite, d) Hirudinaria
e)T.S. of Pheretima, f) T.S. of Nereis, g) T.S. of *Hirudinaria, h)* Parapodium of *Nereis*
10. Study of *Pheretima:* a) Digestive system and b) Nervous system
11. Study of *Hirudinaria:* a) Digestive system and b) reproductive system

Ability Enhancement Course 1 A : Language

BSE I.4A : HINDI

Credits 3 (2L+1T+0P) **Max. Marks: 100**
Contact Hours per week: 4 **C1+C2:50**
Exam duration: 2 Hrs. **C 3: 50**

Objectives:
- To enable the students to acquire basic skills in functional language.
- To develop independent reading skills and reading for appreciating literary works.
- To internalise grammar rules so as to facilitate fluency in speech and writing.
- To develop functional and creative skills in language.
- To develop values of liberalism and an insight into the cultural heritage of the region which remains embodied in the literary output of the region.

COURSE CONTENT:
Unit I: Functional language
Prayojanmoolak Hindi: Saidhantik Pakchh
Prayojanmook Hindi: Zaroorat, Swaroop, Visheshtayen, Prayukti ke Madhyam, Mukhya tatwa-Paribhashik Shabdavali aur Anuvad, Simayen aur Smabhavnayen,

Unit II: Communication skills
Samooh Charcha (Group discussion): Introduction – Definition – Characteristics – Types of Discussion –Round table, Symposium, Lecture forum etc. – Relevance of Group Discussion – Exercises.
Sachhatkar (Interview): Characteristics – Definition – Types of Interviews – Preparation for Interview –Models – Exercises.

Unit III: Collection of Poetries:
Maithilisaran Gupt- Nar Ho Na Nirash Karo Man ko
Jayshankar Prasad- Himadri Tung Sring Se Prabudh Sudhha Bharti
Suryakant Tripathi Nirala- Joohi ki Kali
Sumitranandan Pant- Drut Jharo Jagat Ke Jirn Patra
Mahadevi Verma-Mai Neer Bhari Dhukh Ki Badli,
Sacchidanand Heeranad Vatasyayan Aggey-Kalgi Bajre Ki
Gajanan Madhav Muktibodh- Bhool Galti,
Kedarnath Agrawal- Chandra Gahna Se Lautati Ber
Nagarjun- Aakal Aur Uske Bad
Kedarnath Singh- Aakal Me Saras

Unit IV: Collection of Short Stories:
Chandradhar Sharma Guleri- Usne Kaha Tha
Jayshankar Prasad- Puraskar
Premchand- Panch Parmeshwar
Aggey-Gaingreen (Rooj)
Phanishwar Nath Renu- Teesari Kasam
Bhism Sahani- Cheef ki Dawat
Krisna Sobti-Dadi Amma
Sudha Aroda-Annapurna Mandal Ki Aakhiri Chitthi
Maitreyee Pushpa- Goma Hasti Hai
Omprakash Valmiki- Shavyatra

References:

1. Bhasha, Yugbodh aur Kavita: Dr Ramvilas Sharma, Vani Prakashan, Delhi
2. Kavita ka Vartmaan: Dr P Ravi, Vani Prakashan, Delhi
3. Hindi Kvaya ka Itihas: Ramswaroop Chaturvedi, Lokbharti Prakashan, Delhi
4. Kavita ki Zameen aur Zameen ki Kavita: Namvar Singh, Rajkamal Prakashan, Delhi
5. Naee Kavita aur Astitvawad: Ramvilas Sharma, Rajkamal Prakashan,Delhi
6. Chhayavad: Namvar Singh, Rajkamal Prakashan, Delhi
7. Hindi Kavita ka Atit aur Vartmaan: Maneger Panday, Vani Prakashan, Delhi
8. Hindi Kahani- Antarang Pahchan: Dr Ramdars Mishra, Vani Prakashan, Delhi
9. Hindi Kahani-Sanrachana aur Samvedana: Dr Rachna Saah, Vani Prakashan, Delhi
10. Galp Ka Yatharth-Kathaloochan ke Aayam: Suvas Kumar, Vani Prakashan, Delhi
11. Hindi Ka Gadyaparva: Namvar Singh, Rajkamal Prakashan,Delhi
12. Sahitya ki Pahchan: Namvar Singh, Rajkamal Prakashan,Delhi
13. Katha Vivechan aur Gadyashilp: Ramvilas Sharma, Vani Prakashan, Delhi
14. Kahani Anubhav aur Abhivyakti: Rajendra Yadav, Vani Prakashan, Delhi
15. Kahani- Swaroop aur Samvedana: Rajendra Yadav, Vani Prakashan, Delhi
16. Kahani-Sankramansheel Kala: Khagendra Thakur, Vani Prakashan, Delhi
17. Aadhoonik Hindi Kahani: Laxminarayan Laal, Vani Prakashan, Delhi
18. Hindi Kahani-Vakt Ki Shinakht aur Srijan ka Raag: Rohini Agarwaal, Vani Prakashan, Delhi
19. Kahani Samkaleen Chunautiyan: Dr Sambhoo Gupt, Vani Prakashan, Delhi
20. Prayojanmoolak Hindi- Madhav Sontakke, Rajkamal Prakashan Samooh, Delhi
21. Prayojanmoolak Hindi ki Nayee Bhoomika- Kailash Nath Panday, Rajkamal Prakashan Samooh, Delhi

22. Prayojanmoolak Hindi: Sidhant aur Prayog- Dangal Jhalte, Vani Prakashan, Delhi
23. Sarkari Karyalayon mein Hindi ka Prayog- GopiNath, Shrivastav, Rajkamal Prakashan Samooh, Delhi
24. Hindi Prayog: Ramchandra Verma, Rajkamal Prakashan Samooh, Delhi
25. Anuprayukt Rajbhasha: Manik Mrigesh, Vani Prakashan, Delhi
26. Fundamentals of Journalism, Report Writing and Editing by R. Thomas Berner, Marquette Books, LLC, Washington.
27. Effective Communication Skills, by Omkar N Kour
28. http://www.hindisamay.com

BSE I.4B : KANNADA

Credits 3 (2L+1T+0P) **Max. Marks: 100**
Contact Hours per week: 4 **C1+C2:50**
Exam duration: 2 Hrs. **C 3: 50**

Objectives:

- To enable the students to acquire basic skills in functional language.
- To develop independent reading skills and reading for appreciating literary works.
- To internalize grammar rules so as to facilitate fluency in speech and writing.
- To develop functional and creative skills in language.
- To develop values of liberalism and an insight into the cultural heritage of the region which remains embodied in the literary output of the region.

COURSE CONTENT:

Unit I: Descriptive Grammar
Sandhi (Agama, Adesa, Dwitva, etc) A suitable grammar book on Sandhi will be followed in the classroom.

Unit II: Functional Language
Group Discussion: Introduction – Definition – characteristics – types of discussions – round-table sy lecture forum etc. – relevance of Group Discussion – exercises.

Conversation: Definition – styles of conversation – formats of conversation – telephonic conversation, etc. – Exercises

Unit III: Modern Poetry
i) Kalki – Kuvempu
ii) Thilisaru-Videhi
iii) Balegaarana Haadu –K S Narashimha Swamy
iv) Nanna nayi- Pu Thi Na
v) Nanna avathara – M Gopalakrishna Adiga
vi) Puttavidhave –DA. RA.Bendre
Selected from Aunika Kannada Kavya Part I, University of Mysore.

Unit IV: Prose: Collection of short stories

Collection of Short Stories

i) Danbaru Banbudu- Devanuuru Mahadeva
ii) Kallina Kolalu – Chaturanga
iii) Rotti- P Lankesh
iv) Cappaligalu – Sara Abubakkar

Selected from Sanna Kathegalu, Mysore University, Mysore

References:

1. Kannada Kaipidi, Prasaranga Publication, University of Mysore.
2. Effective Group Discussion – Theory and Practice by Gloria J.Galanes, McGraw Hill Company(Publishers).

BSE I.4C :MALAYALAM

Credits 3 (2L+1T+0P) **Max. Marks: 100**
Contact Hours per week: 4 **C1+C2:50**
Exam duration: 2 Hrs. **C 3: 50**

Objectives:

- To enable the students to acquire basic skills in functional language.
- To develop independent reading skills and reading for appreciating literary works.
- To internalize grammar rules so as to facilitate fluency in speech and writing.
- To develop functional and creative skills in language.
- To develop values of liberalism and an insight into the cultural heritage of the region which remains embodied in the literary output of the region.

COURSE CONTENT:

Unit I :**Descriptive Grammar - Sandhi**

Unit II: Functional Language

Group Discussion- Introduction – Definition – characteristics – types of discussions – round-table symposium – panel – lecture forum etc. – relevance of Group Discussion – exercises

1. Conversation - Definition – styles of conversation – formats of conversation– telephonic conversation, etc. – Exercises

Unit III: Modern Poetry

Lessons from " Kavya Mala, University of Kerala publications,Kerala

1. Mazhuvinte Katha
2. Sabhalamee yaatra
3. Shanta
4. Kochiyile Vrikshangal
5. Bharatheeyam

Unit IV:Literature

Collection of Short Stories:

From Katha malika, University of Kerala publications

1. Kadal theerathu
2. Shavadaham
3. Ammayum makanum
4. Perumazhayude pittennu
5. Chaya

References:
1. Kerala Panineeyam by A R Rajaraja Varma, NBS, Kottayam
2. Effective Group Discussion – Theory and Practice by Gloria J.Galanes, McGraw Hill Company (Publishers).

BSE I.4D :TAMIL

Credits :3 (2L+1T+0P) **Max. Marks: 100**
Contact Hours per week: 4 **C1+C2:50**
Exam duration: 2 Hrs. **C 3: 50**

Objectives:
- To enable the students to acquire basic skills in functional language.
- To develop independent reading skills and reading for appreciating the literary works
- To internalize grammar rules so as to facilitate fluency in speech and writing
- To develop functional and creative skills in language.
- To develop value of liberalism and an insight into the cultural heritage of the region which remains embodied in the literary output of the region.

COURSE CONTENT:

Unit I: Descriptive grammar – Sandhi

Unit II: Functional Language
Group Discussion: Introduction-Definition-Characteristics-types of discussions-round table-symposium-panel-lecture forum etc.-relevance of group Discussions –Exercises
Conversation: Defination-styles of conversation-formats of conversation-telephonic conversation, etc-Exercises
.
Unit III: Poetry: Modern Poetry
Ikkalak Kavithaikal, Kannan En Sevegan, Thiru Arutpa, An Anthology of Tamil Poetry

Unit IV: Prose: Collection of Short Stories
Naatru – (Collection of Short Stories)

References:
1. Tamil Ningalum Thavarillamal Ezuthalam- Dr. Porko
2. Effective Group Discussion – Theory and Practice, Gloria J. Galanes, McGraw Hill Company (Publishers)
3. Naatru, Vaanathi Pathippagam, 13 Deenadayalu Street, T. Nagar, Chennai 600 017

BSE I.4E: TELUGU

Credits 3 (2L+1T+0P) **Max. Marks: 100**
Contact Hours per week: 4 **C1+C2:50**
Exam duration: 2 Hrs. **C 3: 50**

Objectives:

- To enable the students to acquire basic skills in functional language.
- To develop independent reading skills and reading for appreciating the literary works
- To internalize grammar rules so as to facilitate fluency in speech and writing
- To develop functional and creative skills in language.
- To develop value of liberalism and an insight into the cultural heritage of the region which remains embodied in the literary output of the region.

COURSE CONTENT:

Unit I : Functional language (Styles and Registers):

1. Letter writing: Characteristics – Definition – Types of Letters – E-mails – Language of Letters –Exercises
2. NEWS Reporting: Characteristics – Definition – Language of NEWS Reporting - Models – Role of Median NEWS Reporting – Exercises.

Unit II: Communication skills (Effective speaking and effective writing) in language:

1. Group discussion: Introduction – Definition – Characteristics – Types of Discussion – Round table, Symposium, Lecture forum etc. – Relevance of Group Discussion – Exercises.
2. Interview: Characteristics – Definition – Types of Interviews – Preparation for Interview – Models – Exercises.

Unit III: Modern Poetry and Folk literature

1. Desha Charitralu – Sree Sree (From Maha Prasthanam, Visalandhra Publications, Hyderabad).
2. Folk Songs from 'Rayalaseema Raagalu' & 'Triveni' Published by Telugu Academy, Hyderabad

Unit IV: Genre of literature (Piece of a Drama/Portion of Autobiography)
Selected scenes from drama '**Kanyashulkam'** by Gurazada Apparao (available at Visalandhra Publication, Hyderabad.

References:

1. A Hand book of writing activities, Prasaranga, University of Bangalore.
2. The perfect Interview by Max Eaggert, Random House, UK.,
3. Interview Secrets by Heather Salter, Publications: Collins, London,
4. Effective Group Discussion – Theory and Practice be Gloria J.Galanes, McGraw Hill Company.
5. Fundamentals of Journalism, Report Writing and Editing by R. Thomas Berner,

Marquette Books, LLC, Washington.
6. Effective Communication Skills, by Omkar N Kour

Ability Enhancement Course 1B : English

BSE I.5 : PROFICIENCY IN ENGLISH

Credits 3 (2L+1T+0P) **Max. Marks: 100**
Contact Hours per week: 4 **C1+C2:50**
Exam duration: 2 Hrs. **C 3: 50**

Objectives:
Students develop proficiency in English which equips them to:
- understand the demands of audience, subject, situation and purpose and the use of language for effective communication.
- analyse language in context to gain an understanding of grammar, vocabulary, spelling, punctuation and speech.
- examine authentic literary and non-literary texts and develop insight and appreciation.
- gain an understanding of study and reference skills.
- plan, draft, edit and present a piece of writing.

COURSE CONTENT:

Unit I: Descriptive Grammar
1. Tenses:

a) Simple Present: Habitual action, General truths, Future time, Verbs of state, Verbs of perception, Verbs of sensation, Narration, Use of simple present for demonstration and commentaries, Present perfect, present perfect continuous, Present continuous also indicative of future action.

b) Simple past: Past time reference, Present time reference, Future time reference, Past continuous, Past perfect, past, perfect continuous

Unit II: Skills in Communication
1. Negotiating a point of view – learning to talk persuasively so as to get across one's perspective.
2. Debating on an issue – agreeing / disagreeing.

Unit III: Study and Reference Skills
Note making; Note- taking; Summary writing.
Comprehension Skills
Extracts from literary, scientific and educational journals.

Unit IV: Skills of Communication

Advanced Writing Skills, writing advertisement copy; Writing a project proposal and Writing Resume, sending an application.
Listening effectively; Talking about one self (likes, dislikes, interests, beliefs, personality traits, ambitions); Expressing an opinion about personal belief on a current issue. (Ability to speak fluently for 3-4 minutes. Focus would be on organized, logical, sequential presentation of thought through spontaneous speech).

Suggested Activities:

- Politeness competitions- students with partners take turns in using a given number of utterances for negotiation / requests/complaints/small talk.
- Students introduce themselves though using symbols/ metaphors.
- Students collect newspaper/magazine cuttings on topical and/ or cultural issues of interest-write and share their opinion with peers.

References:

1. Block, C.C. (1997). Teaching the Language Arts, 2nd Ed. Allyn and Bacon
2. Mckay. et al. (1995). The Communication Skills Book, 2nd Ed. New Harbinger Publications.
3. Hornby,A.S.(2001).Oxford Advanced Learner's Dictionary, OUP
4. Thomsan,A.J. & Martinet.(2002).A Practical English Grammar.OUP

GENERIC ELECTIVE 1

BSE I.6 : ENVIRONMENTAL EDUCATION

Credits: 2 (1L+ 1T +0P) **Marks: 100**
Contact hrs per week: 3 **C1 + C2: 50**
Exam Duration: 2 hrs **C3: 50**

Objectives

The student-teacher will be able to:

- Develop awareness and concern for environmental issues and sustainable development.
- Acquaint with the concept, objectives and importance of Environmental Education (EE).
- Introduce multi-disciplinary approach to environmental problems.
- Acquaint how to design, develop and implement strategies for Environmental Education (EE).
- Acquaint with the different methods and techniques of teaching Environmental Education (EE).
- Undertake practical activities for school cleanliness, neighbourhood cleanliness drive, and healthy personal hygiene in relation to Swachh Bharat and healthy living. (These activities would have been observed and practiced during the 16-week Internship in schools)
- Inculcate environment friendly values through EE.

COURSE CONTENT :

Unit I : Meaning and Concepts

Meaning as evident from Indian literature and contemporary texts, Definition, Objectives, Importance of EE with special reference to Indian view of life and sustainable development Sustainable Development Goals.

Unit II: Basic Environmental Concepts

Ecosystem, Biotic and Abiotic factors, Inter-relationship, Factors affecting environment, population, air, water, soil, noise; Acid rain, Greenhouse effect, Extinction of species, Soil erosion, Energy crisis, Environment and sustainable development; Role of specially designed strategies for cleanliness, Role of mass media and technology in developing awareness about environmental problems and its prevention, Role of NGO and governmental organizations in developing EE.

Unit III: Curriculum, Methods and Techniques of EE

Designing, developing strategies for EE, Evaluation of EE resources materials; Field trips, Role play, Poster presentation, Quiz, Debate, Projects, Swachh Bharat Abhiyan sustainability

Unit IV: Value Development through EE as in Indian View of Life

Practical work in relation to school cleanliness and neighbourhood watch, Text book evaluation for contents on environment and cleanliness, Field trip on environmental degradation, and school and neighbourhood cleanliness, Visit to nature park, industry polluted areas.

Practicum

- Study sustainable development initiative in the country.
- Visits to polluted sites and preparation of report.
- Interviewing people and reporting the inconveniences due to any of the environmental problems.
- To study innovations done by to improve the environment of that area.
- To study the implementation of Environmental Education Programmes in schools/stated country.
- To prepare models and exhibits for general awareness of public regarding environmental hazards.
- To prepare a programme for environmental awareness and school cleanliness, and to conduct the same with school children.
- To visit industries and study alternative strategies of Environmental pollution management.
- To prepare a resource material on any of the environmental problems along with a suitable evaluation strategy. To prepare quizzes and games on environmental issues.
- Organise Swacch Bharat Abhiyan as sustainable activity.
- To study the contribution of NGOs in improving the environment of the city. Classroom. Prepare posters/chart on Sustainable Development Goals.

* In addition, school and community based activities may be organised.

Evaluation Strategies

1. Assignments/sessional work.
2. Unit tests.
3. Portfolio assessment of exhibits, model of charts prepared by student teachers.
4. Seminar presentations followed by group discussion.

References:

1. Trivedi, M.M. and Pathak, Y.P. (1994). *Manav ane Paryavaran: Bhaugolic Paripekshma, Universitygranth Nirman.* Board Publication, Ahmedabad, Gujarat.
2. Garg, B. and Tiwana (1995). *Environmental Pollution and Protection*. New Delhi: Deep & Deep Publication.
3. Sharma, R.C. (1981). *Environmental Education.* New Delhi: Metropolitan Publication.
4. UNESCO, Environmental Education in the light of the Tbilisi Conference, UNESCO.
5. NCERT (2009), *Project Book in Environmental Education from Class I-X*. New Delhi: NCERT.
6. NCERT (2004), *Environmental Education in Schools.* New Delhi: NCERT.
7. **Web Resources** Towards a Green School on Education for Sustainable Development for Elementary Schools, 2015, NCERT
8. http://www.ncert.nic.in/departments/nie/dee/publication/pdf/Towards%20A%20green%20School.pdf
9. Swachh Bharat Swachh Vidyalaya: A National Mission, Clean India: Clean Schools A Handbook,
   MHRD, http://mhrd.gov.in/sites/upload_files/mhrd/files/upload_document/Eng_Swachch-Bharat-Swachch-Vidhalaya.pdf

PROFESSIONAL EDUCATION COURSES

BSE I.7 :Language Across Curriculum

Credits: 4 (3L+ 1T +0P) **Marks: 100**
Contact hrs per week: 5 **C1 + C2: 50**
Exam Duration: 2 hrs **C3: 50**

Objectives:

The student teacher will be able to:

- Understand nature, function and role of different kinds of languages in curriculum transaction
- Acquaint with obstacles in language usage while using the language and ways to overcome them.
- Understand importance and use of first and second language, multilingualism and impact of culture.
- Acquire knowledge about the communication process and verbal and nonverbal communication skills.
- Familiarize the students with of barriers to (Listening, Speaking, Reading, Writing) LSRW skills and activities for developing these skills.

COURSE CONTENT :

Unit I: Nature and Functions of Language

Language – Meaning and Concept, Functions of Language, Role of Language in Curriculum Transaction, Theories of Language Learning, Barriers in Using a Language & Strategies to Overcome them, Verbal and Non-verbal communication

Unit II :Language across Curriculum in the Indian Context

Language as a determinant of Access, Language proficiency and students' attitude towards Learning and Schooling/ dropouts, Language/oral proficiency and critical thinking

Unit III: Strategies for Multilingual Classrooms

Role Plays and Discussions as tools for learning, 'Questioning' to stimulate thought and to encourage and motivate to respond, Preparing Subject/content based exercises in reading, comprehension and usage, Sensitizing, Reflecting and Facilitating, Understanding the learner and his/her language background, Creating sensitivity to the language diversity, Using oral & written language in the classroom for optimal learning

Unit IV: Developing Receptive Skills and Productive Skills

Barriers to Listening Skills, Activities for Developing Listening Skills, Barriers to Reading Skills, Activities for Developing Reading Skills, Barriers to Writing Skills, Activities for Developing Writing Skills, Need and Importance of Classroom Discourse. Barriers to Speaking Skills, Activities for Developing Speaking Skills

Practicum

1. School Visit to Find out Communication Problem/Apprehension in Students
2. Designing Games and Exercises for Developing Listening, Speaking, Reading and Writing Skills
3. Assignments on Developing Writing Skills- Summary, Letter, Paragraph, Essays, Speech
4. Assignments on Developing Speaking Skills – Oral Presentations, Debate, Elocution, Discussion, Brain-storming

Assignments on Developing Listening Skills – Listening to speech, directions

***** In addition, school and community based activities may be organized with provisions for visits to innovative centres of pedagogy and learning, innovative schools, educational resource centres, etc. Action research based on teaching learning and school and community could be conducted.

References:

1. Akmajian, A. et al. (2010). *Linguistics: Introduction to Language and Communication.* (6th ed.). Cambridge: MIT Press.
2. Fasold, R. & Connor-Linton, J. (2013). *An Introduction to Language and Linguistics*. (6th ed.). Cambridge: Cambridge University Press.
3. Floyd, K. (2009). *Interpersonal Communication*. New York: McGraw Hill Companies Inc.
4. Fromkin, V., Rodman, R. & Hyms, N. (2011). *Introduction to Language.* (9th ed.). Canada: Cengage Learning.
5. Pearson, J.C. et al (2011). *Human Communication.* (4th ed.). New York: McGraw Hill Companies Inc.

Web Resources

6. First and Second Language Acquisition – A Brief Comparison. Retrieved from https://www.uni-due.de/ELE/FLA_SLA_brief_comparison.pdf
7. Similarities and Differences between First and Second Language Acquisition Retrieved from http://multilingualism.pbworks.com/w/page/21913433/Similarities%20and%20Differences%20between%20First%20and%20Second%20Language%20Acquisition
8. Activities for Developing Speaking Skill Retrieved from http://faculty.weber.edu/ppitts/ed4320/Handouts/speakingskills.htm
9. http://www.educ.ualberta.ca/staff/olenka.Bilash/best%20of%20bilash/speaking.html
10. Activities for Developing Listening Skill Retrieved from http://www.educ.ualberta.ca/staff/olenka.bilash/best%20of%20bilash/listening.html
11. https://blog.udemy.com/listening-skills-exercises/
12. Learning curves: Language Education (2009), by Azim Premji Foundation http://azimpremjifoundation.org/pdf/LCIssue13.pdf
13. Courses on Communication Skills, http://nptel.ac.in/courses/109104030/

SECOND SEMESTER

Core Course I B Physics

BSE II.1A : ELASTICITY, WAVES, HEAT, AND THERMODYNAMICS

Credits: 4 (3L+ 0T +1P) **Marks: 100**
Contact hrs per week: 5 **C1 + C2: 50**
Exam Duration: 2 hrs **C3: 50**

Objectives:

- The students will be able to understand principles of elasticity, waves, heat, thermodynamics and classical statistical mechanics and apply its principles to explain natural physical phenomena.
- The teacher will enable the students to identify and modify alternative conceptions in the domains of elasticity, waves, heat, thermodynamics and classical statistical mechanics.

COURSE CONTENT:

Unit I: Elasticity

Elasticity: Hooke's law - Stress-strain diagram - Elastic moduli- Dependence of Young's modulus on temperature and its applications, Relation between elastic constants - Poisson's Ratio-Expression for Poisson's ratio in terms of elastic constants - Elastic potential Energy, Work done in stretching and work done in twisting a wire - Twisting couple on a cylinder - Determination of Rigidity modulus by static torsion - Torsional pendulum-Determination of rigidity modulus and moment of inertia - q, η and σ by Searle's method.

Unit II: Waves

Review of Mechanical waves, types of waves, travelling waves, the superposition principle, wave speed, power and intensity in wave motion. Transverse waves on a string- travelling and standing waves on a string. Normal Modes of a string. Group velocity, Phase velocity. Plane waves. Spherical waves, interference of waves, standing waves, resonance, Doppler effect. Analysis of complex waves. Fourier Series, Application to square wave, triangular wave.

Unit III: Thermodynamics-I

Zeroth Law of thermodynamics and temperature. First law and internal energy, conversion of heat into work, Various Thermodynamical Processes, Applications of First Law: General Relation between C_P& C_V, Work Done during Isothermal and Adiabatic Processes, Compressibility & Expansion Coefficient. Reversible & irreversible processes, Second law & Entropy, Carnot's cycle & theorem.

Unit IV: Thermodynamics-II

Entropy changes in reversible & irreversible processes, Entropy-temperature diagrams. Third law of thermodynamics, Unattainability of absolute zero. Thermodynamic potentials. Enthalpy, Gibbs, Helmholtz and Internal Energy functions, Maxwell's relations& applications - Joule-Thompson Effect, Clausius-Clapeyron Equation, Expression for ($C_P - C_V$), C_P/C_V, TdS equations.

References:

1. David Halliday, Robert Resnick and Jay Walker, Fundamentals of Physics, 6th Edition, John Wiley and Sons, Inc.
2. Harris Benson, University Physics, Revised Edition, John Wiley and Sons Inc.
3. Zeemansky and R. Dittman, Heat and Thermodynamics, McGraw Hill, 7th edition, 1996.
4. H J Pain, Physics of Vibration and Waves, Wiley; Sixth edition, 2006.
5. Brijlal and Subramaniam, Heat and Thermodynamics, S Chand, 2008.
6. Matveev, Thermal Physics, MIR Publications
7. D S Mathur, Elements of Properties of Matter, S.Chand (G/L) & Company Ltd., 2010.
8. A. B. Gupta and H. Ray, Heat and Thermodynamics, New central publications.
9. D. S. Mathur, Heat and Thermodynamics, Sultan Chand.
10. M. N. Saha and B. N. Srivastava, Treatise on Heat, The Indian Press.
11. A. Kumar and S.P. Taneja, Thermal Physics, R. Chand Publications, 2014.

PRACTICALS

Exam Duration : 3 hrs **C3 : 50**

Objectives:

- To provide training in the broad methodology of science through investigatory type and open-ended laboratory exercises.
- To validate the theoretical basis of the experiments.

COURSE CONTENT:

(A minimum of TEN experiments out of the following).

1. Study of the oscillations of a column of water as a function of its length and study of damped oscillation.
2. To determine the velocity of sound at 0^o C and the end correction by setting up a resonance column (first resonance length).
3. Study of torsional oscillations of a loaded wire and determination of the rigidity modulus of the material of the wire.
4. Study of transverse vibrations on a sonometer. To determine the frequency by (i) absolute method, (ii) Comparison method.
5. Study of Newton's law of cooling.
6. Determination of solar constant.
7. J by Joules Calorimeter.
8. Study of the rate of flow of water through a capillary tube under different pressure heads.
9. Study of the relation between pressure and volume of a gas at constant temperature

10. Study of variation of pressure and temperature of a gas at constant volume.
11. To study the variation of thermo emf across two junctions of a thermocouple with temperature
12. Surface Tension-capillary rise method-radius by vernier microscope
13. Study of the motion of a steel sphere in a viscous liquid and determination of the coefficient of viscosity of the liquid.
14. Melde's experiment – determination of frequency.
15. Lees and Charlton disc – Thermal conductivity of a bad conductor.
16. Specific heat of a solid by the method of mixtures.

References:

1. B.L.Flint & H.T.Worsnop, Advanced Practical Physics for students, Asia Publishing House,1971.
2. E Armitage, Practical Physics, John Murray.
3. PSSC Physics Laboratory Guide.
4. S.Panigrahi & B.Mallick, Engineering Practical Physics, Cengage Learning India Pvt. Ltd., 2015
5. Indu Prakash and Ramakrishna, A Text Book of Practical Physics, 11th Edition, Kitab Mahal, New Delhi, 2011.
6. Jerry D Wilson and Cecilia A. Hernández-Hall Physics Laboratory Experiments7thEdition, Cengage Learning, 2009.
7. D.P. Khandelwal,A Laboratory Manual of Physics for Undergraduate Classes, Vani Publication, 1985.

Core Course 1 B Botany

BSE II.1B :Diversity of Cryptogams

Credits: 4 (3L+ 0T +1P) **Marks: 100**
Contact hrs per week: 5 **C1 + C2: 50**
Exam Duration: 2 hrs **C3: 50**

Objectives:

- To acquaint students with the structure, classification and life history of Bryophyta and Pteridophyta.
- To understand the Geological time scale and the importance of fossils.
- To understand the evolutionary trends among Pteridophytes.

COURSE CONTENT :

Unit I : BRYOPHYTA

a) General characters, distribution, structure, reproduction, alternation of generation, classification and economic importance.
b) Study of morphology, anatomy and reproduction in Hepaticopsida: Marchantia
c) Study of morphology, anatomy and reproduction in
Anthocerotopsida : Anthoceros
Bryopsida : Funaria
d) Origin and affinities of bryophytes – brief account.

Unit II : PALAEOBOTANY

a) General account of geological time scale, types of fossils, fossilization process, radioactive carbon dating, and importance of fossils.
b) Study of Rhynia, Lepidodendron, Lepidostrobus.

Unit III : PTERIDOPHYTA

a) General characters, distribution, reproduction, life cycle and classification.
b) Study of morphology, anatomy and reproduction in
Psilopsida : Psilotum
Lycopsida : Lycopodium, Selaginella

Unit IV :

a) Sphenopsida : Equisetum
b) Study of morphology, anatomy and reproduction in Pteropsida : Marsilea
c) Evolution of steles in Pteridophytes
d) Origin and significance of heterospory and seed habit.

References:

1. Smith.G.M.,1971, Cryptogamic Botany Vol.II, TMH Publishing House, New Delhi.
2. Sporne, K.R., 1974, Morphology of Pteridophytes, Hutchinson & Co., London.
3. Rashid, A. An Introduction to Pteridophyta.
4. Pandey, Mishra & Trivedi, 2007, A Textbook of Botany Vol.II, Rastogi Publications, Meerut.
5. Singh,V., P.C.Pande & D.K.Jain 2006, A Textbook of Botany, Rastogi Publications, Meerut.
6. Singh V., P.D.Pande & D.K.Jain 2005, Diversity and Systematics of Seed plants, Rastogi Publications, Meerut.
7. Parihar, N.S., Bryophyta.
8. Parihar, N.S., Introduction to Embryophyta Vol.II Pteridophyta.
9. Vashishta, P.C.1982, Peridophyta, S.Chand & Co. Ltd., New Delhi.
10. Gangulee H.C., Kar and Ashok Kumar,1982, College Botany Vol.II, Central Book Agency, Calcutta.
11. Anrold, Introduction to Palaeobotany, McGraw Hill, London.

PRACTICALS

Exam Duration : 3 hrs **C3 : 50**

Objectives :

- To develop the skill of freehand sectioning, staining and mounting Bryophyta and Pteridophyta materials.
- To observe and identify temporary micropreparations and permanent slides.
- Study of the genera included under bryophytes and pteridophytes by observing temporary micropreparations and permanent slides.
- To prepare permanent, double-stained micropreparations.

COURSE CONTENT:

1. Study of the morphology, anatomy and reproductive structures of genera included in Byophyta and Pteridophyta.
2. Preparation and submission of 2 double-stained slides

Core Course 2 B :Chemistry

BSE II.2 :STATES OF MATTER AND NUCLEAR CHEMISTRY

Credits: 4 (3L+ 0T +1P) **Marks: 100**
Contact hrs per week: 5 **C1 + C2: 50**
Exam Duration: 2 hrs **C3: 50**

Objectives :

- Illustrate how a scientific model can be constructed based on the experimental observations of the behaviour of gases and to explain the properties in terms of microscopic organization.
- To develop an understanding of properties of Gases, Liquids, colloids and Solutions.
- To understand the shapes of molecules in terms of symmetries and to relate the properties of matter in solid state to the structure.
- To develop an understanding of the concept of acids and bases, characteristics of non-aqueous solvents.
- To familiarize radioactivity as a nuclear phenomenon in understanding the nuclear reactions

COURSE CONTENT

Unit I : Gaseous and Solid State

Review of kinetic theory of gases and van der walls equation. Qualitative discussion of the Maxwell's distribution of molecular velocities, collision number, mean free path and collision diameter. Liquefaction of gases based on Joule-Thomson effect.

Explanation of the macroscopic properties of solids in terms of structure, bonding and defects. Definition of space lattice, unit cell.
Laws of crystallography – (i) Law of constancy of interfacial angles, (ii) Law of rationality of indices, (iii) Law of symmetry. Symmetry elements in crystals.
X-ray diffraction by crystals. Derivation of Bragg equation. Predicting crystal structure . Defects in solids , Dielectric properties. Review a perfect gas connecting temperature with kinetic theory. Postulates of kinetic theory of gases, deviation from ideal behaviour, van der Waals equation of state. Critical Phenomena : P-V isotherms of real gases, continuity of states, the isotherms of van der Waals equation, Derive a relationship between critical constants and van der Waals constants, the law of corresponding states, reduced equation of state.

Molecular Velocities: Root mean square, average and most probable velocities. Qualitative discussion of the Maxwell's distribution of molecular velocities, collision number, mean free path and collision diameter. Liquefaction of gases (based on Joule-Thomson effect).

Unit II : Liquids and Colloids

Accounting the Isotropic and intermediate behaviour of liquids as a link between solids and gases. Also tracing the role of liquids as solvents and reaction regulators Intermolecular forces, structure of liquids (a qualitative description).

Structural differences between solids, liquids and gases.

Liquid crystals: Difference between liquid crystal, solid and liquid. Classification, structure of nematic and cholestric phases. Thermography and seven segment cell.

Definition of colloids, classification of colloids.

Solids in liquids (sols) : Properties – kinetic, optical and electrical; stability of colloids, protective action, Hardy – Schulze law, gold number.

Liquids in liquids (emulsions) : Types of emulsions, preparation. Emulsifier.

Liquids in Solids (gels) : Classification, preparation and properties, inhibition, general applications of colloids.

Unit III : Acids and bases

A discussion on changing concepts of acids and bases involving concentrations and effects of solvent medium. Arrhenius, Bronstead-Lowry and Lewis concepts of acids and bases.

Hard and Soft Acids and Bases (HSAB) -Classification of acids and bases as hard and soft. Pearson's HSAB concept, acid-base strength and hardness and softness. Symbiosis, theoretical basis of hardness and softness, electronegativity and hardness and softness.

Non-aqueous Solvents- Physical properties of a solvent, types of solvents and their general characteristics, reactions in non-aqueous solvents with reference to liquid NH_3 and liquid SO_2.

Unit IV : Nuclear Chemistry

Fundamental particles of nucleus, Concept of Nuclides, isotopes, isobars and isotones (with specific examples), nuclear forces, qualitative idea of stability of the nucleus (n/p ratio), binding energy, packing fraction, Natural and artificial radioactivity, Radioactive Disintegration series, half life, average life,nuclear reactions, artificial transmutation, nuclear fusion and fission. Nuclear fusion as a future source of energy, Nuclear reactors, Application of Radioactivity and Radio isotopes as tracers in chemistry, biology, medicine, agriculture and industry. Isotope dilution analysis, Neutron activation analysis.

References :

1. Essentials of Physical Chemistry Arun Bahl B.S.Bahl, G.D.Tuli, S.Chand & Company Ltd.
2. Principles of Physical Chemistry : Marron and Prutton
3. Elements of Physical Chemistry : Samuel Glasstone and Lewis
4. Physical Chemistry : P W Atkins
5. Nuclear Chemistry V.N.Darls Sultan Chand & sons.
6. Essentials of Nuclear Chemistry Arnikar, Hari jeevan, 4th edition, New age international.

PRACTICAL

Exam Duration : 3 hrs **C3 : 50**

Objectives:

- To evolve a scheme of qualitatively analyzing an inorganic mixture classification of anions and cations.
- Quantitative inorganic analysis of mixtures containing four radicals.
- To develop skills of synthesizing coordination compound

COURSE CONTENT:

1. To arrive at a scheme of analysis of anions and cations based on solubility products and common ion effect: Systematic qualitative analysis by micro-scale methods of a mixture containing two acidic and two basis radicals from the following list(not more than one interfering radical):
   Cations: lead, copper, bismuth, cadmium, tin, antimony, iron, aluminium, zinc, cobalt, nickel, calcium, strontium, barium, magnesium, sodium potassium, ammonium.
   Anions: carbonate, bicarbonate, acetate, fluoride, chloride, bromide, iodide, nitrate, sulphate, borate, oxalate, phosphate.
2. Preparation of the complexes:
   Tris(thiourea)copper(I)sulphate monohydrate, Mercury tetra thiocyanato cobaltate(II), simple cobalt and chromium complexes and their analysis.

References:

1. A Text Book of Quantitative Inorganic Analysis, A .I . Vogel
2. Advanced Practical Inorganic Chemistry, Gurudeep

Core Course 3 B Mathematics

BSE II.3A :CALCULUS – II, ANALYTICAL GEOMETRY AND NUMBER THEORY

Credits: 4 (3L+ 1T +0P) **Marks: 100**
Contact hrs per week: 5 **C1 + C2: 50**
Exam Duration: 2 hrs **C3: 50**

Objectives:

At the end of the course students will be able to understand the concepts of number system and analytical geometry and principles and techniques of calculus of several variables in problem solving.

COURSE CONTENT:

Unit I: Partial Derivatives – I

Functions of two or more variables, Limits, Continuity, Partial derivatives, Differentiable functions, Linear approximation theorem. Homogeneous functions, Euler's Theorem, Chain Rule, Change of Variable, Directional Derivative, Partial Derivatives of higher order, Taylor's Theorem, Derivative of Implicit functions, Jacobians.

Unit II: Analytical Geometry – I

Cartesian coordinates in three dimensional spaces, Relation between Cartesian coordinates and position vector, Distance formula (Cartesian and Vector form), Direction cosines, Direction ratios, Projection on a Straight line, angle between two lines, Area of Triangle, Volume of a tetrahedron. Straight line, equations of straight lines (Cartesian and Vector form).

Unit III: Analytical Geometry – II

Planes, Equations of Planes (Cartesian and Vector form), Normal form, Angle between planes, Coaxial planes, Parallel and Perpendicular planes, Length of a Perpendicular from a point to a plane, Bisectors of angles between two planes, Shortest distance between two skew lines.

Translation and Rotation of Cartesian axes in plane, Curves of second degree, Discriminant and Trace, Theorem on Discriminant and trace, Classification theorem on second degree equation.

Unit IV: Theory of Numbers

Division Algorithm – Prime and Composite Numbers – proving the existence and uniqueness of GCD and the Euclidean Algorithm – fundamental theorem of Arithmetic - the least common multiple – congruences – linear congruences – Wilson's theorem – Simultaneous congruences – Theorem of Euler – Fermat and Lagrange.

References :

1. Calculus by Anton,Wiley.
2. Calculus with Analytic Geometry by S K Stein, McGraw Hill.
3. Calculus and Analytical Geometry by Thomas and Finney, S.Chand and Co. Ltd.
4. First Course in Calculus by Serge Lang, Addison-Wiley.
5. Calculus, Vols. 1 and 2 by Lipman Bers, IBH.
6. Introduction to Calculus and Analytical Geometry by Courant and John, Narosa Publishing House.
7. Advanced Calculus by Frank Ayres, Schaum Publishing Co.
8. Higher Algebra by Bamard and Child, Macmillan India Ltd.
9. Integral Calculus by Shanthinarayan, S.Chand and Co. Ltd.
10. Differential Calculus by Gorakhprasad, Pothishala Ltd.
11. A Course in calculus and Real Analysis-Iby Ghorpade S R and Limaye B V (2006), Springer Verlag
12. Elementary Number Theory by David M. Burton.
13. Elementary Number Theory with applications (2^{nd} edition) by Thomas Koshy, Academic Press.

Core Course 3B : Zoology

BSE II.3B :ANIMAL DIVERSITY–II

Credits: 4 (3L+ 0T +1P) **Marks: 100**
Contact hrs per week: 5 **C1 + C2: 50**
Exam Duration: 2 hrs **C3: 50**

Objectives:

- To acquaint students with the diversity that exists in invertebrates and vertebrates
- To enable students to understand invertebrates, their organizational hierarchies and complexities;
- To understand the external morphology and internal structure; identification and classification with examples;
- To enable them to understand various modes of adaptations in animals

COURSE CONTENT

UNIT I: ARTHROPODA AND ONYCHOPHORA

a) **Arthropoda**: General characters and classification of Phylum Arthropoda up to classes with examples, Type study: *Periplaneta americana* – External morphology, digestive system, circulatory system, respiratory system, excretory system, nervous system and reproductive system; Mouth parts and metamorphosis in Insects.

b) **Onychophora**: Salient features of *Peripatus*, systematic position and phylogeny of Onychophora.

UNIT II: MOLLUSCA

a) **Mollusca**: General characters and classification of Phylum Mollusca up to classes with examples; *Pila* – External morphology, digestive system, nervous system, respiration, circulation and reproduction; Torsion and detorsion in Mollusca; Molluscan shell; Comparative account and Pearl formation.

UNIT III: ECHINODERMATA AND CHORDATA

a) **Echinodermata:** General characters and classification of Phylum Echinodermata up to classes with example; Type study: *Asterias* – External morphology, digestive system, water-vascular system, haemocoelomic system and reproductive system, life-cycle and metamorphosis; Larval forms in Echinodermata.
b) **Chordata**: General characters and outline classification of Phylum Chordata up to classes with examples;
c) **Hemichordata:** *Balanoglossus* External morphology, nutrition, respiration and reproduction.

UNIT IV: PROTOCHORDATA AND CYCLOSTOMATA

a) ***Herdmania***– External morphology, nutrition, respiration and reproduction.
b) ***Amphioxus* –** External morphology, Digestive system, nutrition, respiration and reproduction; Affinities and phylogenetic relationship among Hemichordata, Urochordata and Cephalochordata.

c) **Cyclostomata –** General characters and classification of Class Cyclostomata up to orders with examples.; Type study: *Petromyzon* – External morphology, digestive system, respiratory system and reproduction; Structure and metamorphosis of Ammocoetes larva; Affinities of Cyclostomata.

References:

1. Invertebrate Zoology by E.L.Jordon and P.S. Verma – S. Chand & Co., Delhi).
2. Invertebrate Zoology by J.K.Dhami and P.S.Dhami – S. Chand & Co., Delhi).
3. Invertebrate Zoology series (Protozoa to Echinodermata) by R.L. Kotpal – (Rastogi Publications, Meerut, 2008).
4. The Invertebrate series of L.H.Hyman – (McGraw Hill).
5. A student's textbook of Zoology by Adam Sedgwick Vol. I, II & III – (Central Book Depot, Allahabad).
6. A Textbook of Zoology vol.1 by Parkar and Haswell – (MacMillan).
7. Destructive and Useful Insects- Their habits and control by Metcalf and Flint – (Tata McGraw Hill, New Delhi).
8. Protochordates by K.S. Bhatia.
9. Modern Textbook of Zoology Invertebrates by R.L. Kotpal – (Rastogi Publications, Meerut, 10^{th} Revised Edition, 2008).
10. Modern Textbook of Zoology: Vertebrates by R.L. Kotpal – (Rastogi Publications, Meerut, 3^{rd} Edition, 2008).

PRACTICALS

Exam Duration : 3 hrs **C3 : 50**

OBJECTIVES:

To develop in students the skills of:

- Staining and mounting of materials (temporary and permanent);
- Preparation of cultures of invertebrates by using common culture methods;
- Laboratory observation of animal specimens;

COURSE CONTENT:

1. Study of specimens of Arthropoda and Onychophora:
   a) *Limulus b) Palamnaeus c) Palaemon d) Balanus, e) Cancer, f) Scolopendra, g) Spirobolus h) Peripatus j)Aranea*
2. Identification and classification of any common insects belonging to five different orders (Diptera, Coleoptera, Hymenoptera, Lepidoptera and Hemiptera)
3. Study and mounting (a & b) of mouth parts:
   a) *Culex/Anopheles* b) *Periplaneta,* c) *Apis*, d) butterfly e) housefly
4. Study of Crustacean larvae:
   a) Nauplius, b) Zoaea, c) Mysis, d) Megalopa
5. Study of specimens and permanent slides of Mollusca:
   a) *Chiton b) Pila, c) Dentalium d) Unio, e) Sepia, f) Glochidium*larva.
6. Study of specimens and permanent slides (larvae) of Echinodermata:

a) *Astropecten/Asterias, b) Ophiothrix, c) Echinus, d) Holothuria, e) Antedon f) Bipinnaria larva g) Echinopluteus larva*

7. Study of specimens and permanent slides of Protochordata:
   i) *Balanoglossus*: a) Entire, b) T.S. through proboscis, c) T.S. through trunk region,
   ii) Herdmania
8. Study of *Amphioxus*: a) Entire, b) T.S. through pharynx, c) T.S. through intestine
9. Study of specimens of Cyclostomata: a) *Petromyzon* and b) *Myxine*
10. Identification of gastropods, cephalopods and bivalves using keys for identification
11. Study of *Palaemon/Periplaneta (Chart/assimilation)*: a) Digestive system b) Nervous system c) statocyst d) mouth parts
12. Study of *Pila (Chart/assimilation)*: a) Radula b) Nervous system

ABILITY ENHANCEMENT COURSE AEC 1B : LANGUAGE

BSE II.4A:HINDI

Credits 3 (2L+1T+0P) **Max. Marks: 100**
Contact Hours per week: 4 **C1+C2:50**
Exam duration: 2 Hrs **C 3:50**

Objectives:

- To enable the students to acquire basic skills in functional language.
- To develop independent reading skills and reading for appreciating literary works.
- To internalise grammar rules so as to facilitate fluency in speech and writing .
- To develop functional and creative skills in language.
- To develop values of liberalism and an insight into the cultural heritage of the region which remains embodied in the literary output of the region.

COURSE CONTENT:

Unit I : Functional Language
Prayojanmoolak Hindi: Prayog ke Chhetra
Prayojanmoolak Hindi: Rajbhasha Hindi-Samvaidhanik Pravdhan, Raajbhasha Adhiniyam Aadi**,** Sarkari Karyalayon mein Prayukt Hindi-Karyalayee Aalekhan, Tippan, Patrachar, Sanchhepan

Unit II : **Communication skills**
Varta (Conversation): Characteristics – Definition – Styles of conversation – Higher order skills-Telephonic conversation, Role Play, – Models, etc. – Exercises.
Bahas (Debate): Characteristics – Definition – Need of Debate – Technique to conduct Debates, etc. Exercise.

Unit III :Drama and Novel
Hanoosh by Bhishm Sahani Published by Rajkamal Prakashan, Delhi
Karmbhoomi by Premchand, Swaraj Prakashan, Delhi

Unit IV : Modern Literature

Collection of Essays:

a) Baalkrisna Bhatt- Manusya Ke Jivan Ki Sarthakta
b) Mahaveer Prasad Diwedi- Sahitya Ki Mahatta
c) Sardar Purn Singh- Aacharan Ki Sabhyata
d) Hajari Prasad Diwedi- Kutaj
e) Harishankar Parsai- Thithurta Hua Gantantra
f) Nirmal Verma- Dharm Aur Dharmnirpechhata

References:

1. Prayojanmoolak Hindi- Madhav Sontakke, Rajkamal Prakashan Samooh, Delhi
2. Prayojanmoolak Hindi ki Nayee Bhoomika- Kailash Nath Panday, Rajkamal Prakashan Samooh, Delhi
3. Prayojanmoolak Hindi: Sidhant aur Prayog- Dangal Jhalte, Vani Prakashan, Delhi
4. Hindi Nibandh Sahitya ka Sanskritik Addhyan: Dr Baburam,Vani Prakashan, Delhi
5. Hindi Gadhya-Vinayas aur Vikas: Ramswaroop Chaturvedi, Lokbharti Prakashan, Delhi
6. Aadhunik Hindi Ka Gadhya Sahitya: Ramchandra Tivari, Lokbharti Prakashan, Delhi
7. Aadhunik Hindi Sahitya ka Itihas: Bacchan Singh, Lokbharti Prakashan, Delhi
8. Bhakti Aandolan aur Surdaska Kavya: Maneger Panday, Vani Prakashan, Delhi
9. Bhakti Ke Aayam: Dr P Jayraaman, Vani Prakashan, Delhi
10. Bhartiya Bhakti Sahitya: Dr Rajmal Bora, Vani Prakashan, Delhi
11. Bhaktikavya ka Samajdarshan: Dr Premshankar, Vani Prakashan, Delhi
12. Anuprayukt Rajbhasha: Manik Mrigesh, Vani Prakashan, Delhi
13. Prayojanmoolak Hindi- Madhav Sontakke, Rajkamal Prakashan Samooh, Delhi
14. Prayojanmoolak Hindi ki Nayee Bhoomika- Kailash Nath Panday, Rajkamal Prakashan Samooh, Delhi
15. Prayojanmoolak Hindi: Sidhant aur Prayog- Dangal Jhalte, Vani Prakashan, Delhi
16. Sarkari Karyalayon mein Hindi ka Prayog- GopiNath, Shrivastav, Rajkamal Prakashan Samooh, Delhi
17. Alankar Mimansh: Murlimanohar Prsad Singh, Swaraj Prakashan, Delhi
18. Saral Hindi Vyakaran: Swaraj Prakashan, Delhi
19. Upanyas aur Lokjeevan: Railph Fox, Vani Prakashan, Delhi
20. Upanyas ka Uadai: Aayan Waat, Hariyana Grantha Academy,Haryana

BSE II.4B: KANNADA

Credits 3 (2L+1T+0P) **Max. Marks: 100**
Contact Hours per week: 4 **C1+C2:50**
Exam duration: 2 Hrs **C 3:50**

Objectives*:*

- To enable the students to acquire basic skills in functional language.
- To develop independent reading skills and reading for appreciating literary works.
- To internalize grammar rules so as to facilitate fluency in speech and writing.
- To develop functional and creative skills in language.
- To develop values of liberalism and an insight into the cultural heritage of the region which remains embodied in the literary output of the region.

COURSE CONTENT:

Unit I: Descriptive Grammar
Samasa and Alankara

Unit II: Functional Language
a) News reporting: Characteristics – definition – language of news reporting–model of news report-patterns – role of media in news reporting – exercises.
b) Interview: Characteristics – definitions – preparation for interview – various types of interviews (business – employment – literary etc) – exercises.

Unit III: Medieval Poetry
i) Enna Devange Jagavella Hennu Noada - Akkamahadevi
ii) Kaayuttirdanirulu Hagalennade-Raghavanka
iii) Parahimseyam Madi Manavam Baldapane – Lakshmeesha
(Kaavya Sanchaya – 3- Mysore University, Mysore).

Unit IV: Collection of Essays
i) Prajle Mattu Parisara-U R Ananthamurthy
ii) Samakalina Prajne– G S Shivarudrappa
iii) Samaanaavakaasha – S L Bhairappa
iv) Namma Prachinara Jivana Moulyagalu- T V Venkatachalashastri
(Selected from Gadya Vihara Part III) Mysore University, Mysore

References:
1. Kannada Kaipidi, Prasaranga Publication, University of Mysore
2. Fundamentals of Journalism, Report Writing and Editing by R.Thomas Berner, MarquetteBooks LLC, Washington.
3. The Perfect Interview by Max Eggert, Random House, UK.

BSE II.4C: MALAYALAM

Credits 3 (2L+1T+0P) **Max. Marks: 100**
Contact Hours per week: 4 **C1+C2:50**
Exam duration: 2 Hrs **C 3:50**

Objectives*:*

- To enable the students to acquire basic skills in functional language.
- To develop independent reading skills and reading for appreciating literary works.
- To internalize grammar rules so as to facilitate fluency in speech and writing.
- To develop functional and creative skills in language.
- To develop values of liberalism and an insight into the cultural heritage of the region which remains embodied in the literary output of the region.

COURSE CONTENT:

Unit I. **Descriptive Grammar**

Samasa and Alamkara

Unit II :**Functional Language**

1. News reporting- Characteristics –definition – language of news reporting– model of news report- patterns – role of media in news reporting – exercises
2. Interview- Characteristics – definitions – preparation for interview – various types of Interviews(business – employment – literary etc) – exercises.

Unit III: Poetry - Medieval

VEENA POOVU by Kumaaran ashan, Published by Devi Book Stall, Kodungalloor

Unit IV: Collection of Essays

Lessons from “Bharatha Paryatanam By Kutti Krishna Maraar, Published by Maraar Sahitya Prakasha, Kozhikode

1. Yudhathinte parinaamam
2. Amba
3. Karnante arangettram
4. Markandeyante chiri

References:

1. Bhashaa bhushanam and Kerala Paanineeyam, NBS, Kottayam
2. Fundamentals of Journalism, Report Writing and Editing by R.Thomas Berner, Marquette Books LLC, Washington.
3. The Perfect Interview by Max Eggert, Random House, UK.

BSE II.4D:TAMIL

Credits 3 (2L+1T+0P) **Max. Marks: 100**
Contact Hours per week: 4 **C1+C2:50**

Exam duration: 2 Hrs **C 3:50**

Objectives:

- To enable the students to acquire basic skills in functional language.
- To develop independent reading skills and reading for appreciating the literary works
- To internalize grammar rules so as to facilitate fluency in speech and writing
- To develop functional and creative skills in language.
- To develop value of liberalism and an insight into the cultural heritage of the region which remains embodied in the literary output of the region.

COURSE CONTENT:

Unit I: **Aspects of Style**
Styles of writing
Idioms, Phrases and Proverbs

Unit II: Functional Language:
News Reporting: Characteristics-Definition-language of news reporting-model of news reporting-patterns-role of media in news reporting –exercises.
Interview: Characteristics-definition-preparation for interview-various types of interviews (business-employment-literary etc.)-exercises

Unit III: Medieval Poetry
Periya Puranam Selection of poems
Naladiyar – Selection of poems
An Anthology of Tamil Poetry

Unit IV: Collection of Essays
Ariviyal Tamilzhakkam-S. V. Shanmugam (3 Essays), New Century Book House (P) Ltd, 41 – B SIDCO Industrial Estate Chennai 600 017, Tamil Nenjam-Dr. M. Varadharajan (3 Essays)

References:

1. Tamil Ningalum Thavarillamal Ezhuthalam, Dr. Porka
2. Fundamentals of journalism, Report Writing and editing by R. Thomas Berner, Maruette Books LLC, Washington.
3. The perfect Interview by Max Eggert, Random House, UK.

BSE II.4E:TELUGU

Credits 3 (2L+1T+0P) **Max. Marks: 100**
Contact Hours per week: 4 **C1+C2:50**
Exam duration: 2 Hrs **C 3:50**

Objectives:

- To enable the students to acquire basic skills in functional language.
- To develop independent reading skills and reading for appreciating the literary works
- To internalize grammar rules so as to facilitate fluency in speech and writing
- To develop functional and creative skills in language.
- To develop value of liberalism and an insight into the cultural heritage of the region which remains embodied in the literary output of the region.

COURSE CONTENT:

Unit I: Functional language (Styles and Registers)

1. Essay Writing: Characteristics – Definition – Format of Essays – Types of Essays (Literary, Scientific, etc.) – Models – Exercises.
2. Translation: Characteristics – Definition – Need of Translation – Translation Models – Exercises (From English to Regional Languages).

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Unit II : Communication skills (Effective speaking and effective writing) in language

1. Conversation: Characteristics – Definition – Styles of conversation – Higher order skills- Telephonic conversation, Role Play, – Models, etc. – Exercises.
2. Debate: Characteristics – Definition – Need of Debate – Technique to conduct Debates, and other Exercise.

Unit III: Ancient Poetry and medieval poetry

1. Damayanthee Swayamvaram by Nannaya (First 18 Poems)
2. Sathyabhama Santhwanam by Nandi Timmana (Poems 82 to 104)

(From Telugu Sahithya Sravanthi, by Prasaranga, University of Mysore, Mysore).

Unit IVGenre of literature (Prose: Literary Work)

1. Andrula Sanghika Acharamulu by Khandavalli Lakshmi Ranjanam.
2. Telugu Samethalu by Nayani Krishna Kumari

(From Telugu Sahithya Sravanthi, by Prasaranga, University of Mysore, Mysore).

References:

1. A Hand book of writing activities, Prasaranga, University of Bangalore.
2. About Translation by Peter Newmark, Multi lingual Motters, Clavedon, UK,
3. The art of Translation (A Symposium), Ministry of Scientific Research and Cultural Affairs, Govt.of India.
4. Effective Group Discussion – Theory and Practice be Gloria J.Galanes, McGraw Hill
5. Anuvada Samsyalu by Rachamallu Ramachandra Reddy, Published by Visalandhra Books, Hyderabad
6. Aspects of Translation, Prof K V V L Narasimha Rao, CIIL Publication, Mysore

Ability Enhancement Course AEC 2B : English

BSE II.5 : PROFICIENCY IN ENGLISH-1I

Credits 3 (2L+1T+0P) **Max. Marks: 100**
Contact Hours per week: 4 **C1+C2:50**
Exam duration: 2 Hrs **C 3:50**

Objectives :

Students develop proficiency in English which equips them to:

- understand the demands of audience, subject, situation and purpose and the use of language for effective communication.
- analyse language in context to gain an understanding of grammar, vocabulary, spelling, punctuation and speech.
- examine authentic literary and non-literary texts and develop insight and appreciation.
- gain an understanding of study and reference skills.
- plan, draft, edit and present a piece of writing.

COURSE CONTENT:

Unit I: **Descriptive Grammar**
Function of Auxiliaries; Modals; Question form
Clauses: Noun Clause; Reported Speech and Change of Voice.

Unit II: Development of Language Competence
To be based on the use of multiple texts which address issues of multiculturalism, gender, racism and texts which relate with current issues and contemporary trends. Short stories, comic strips, cartoons and animations (both print and non-print media) to be used. Speeches of famous persons, diaries, travelogues can also be used.

Unit III: Writing for Functional Purposes
Letter-writing (Professional / Personal)

Unit III: Creative Skills in Writing
Writing dialogues, poems and essays

Unit IV: Basic Phonetics
Sounds of English language, intonation and transcription using IPA.

References:

1. Chan. et al. (1997) Professional Writing Skills, San Anselma, CA
2. Fiderer, A. (1994) Teaching Writing: A Workshop Approach. Scholastic.
3. Block, C.C. (1997). Teaching the Language Arts, 2nd Ed. Allyn and Bacon
4. Mckay. et al. (1995). The Communication Skills Book, 2 nd Ed. New Harbinger Publications.
5. Merrriam, E. (1964). It Doesn’t Always Have to Rhyme. Atheneum.

6. Hyland, Ken (2004) Second Language Writing. University of Michigan Press.
7. Graves,D (1992). Explore Poetry: The reading /writing teacher's companion.Heinemann
8. Stone Douglas (1999). Difficult conversations: How to discuss what Matters Most, New York.:Penguin Books.
9. Gabor Don (2001). How to start a Conversation and Make Friends, New York: Fireside.

PROFESSIONAL EDUCATION COURSES

BSE II.6: CONTEMPORARY INDIAN EDUCATION

Credits: 4 (3L+ 1T +0P) **Marks: 100**
Contact hrs per week: 5 **C1 + C2: 50**
Exam Duration: 2 hrs **C3: 50**

Objectives:
The course enables the student teachers to:

- Understand different perspectives of Education.
- Analyse the concept of Education and its related terms
- Analyse the Aims of Education and their determinants
- Reflect on the educational ideas and systems of various thinkers and develop the ability to theorize educational practices;
- Collect evidences for the influence of socio-cultural aspects on Education
- Analyse the role of Education on society by gathering various evidences and illustrations
- Understand and appreciate the need of autonomy to teacher and learners
- See the relationship between autonomy, accountability, and commitment
- Arrive at a list of qualities of a committed teacher through discussions.

COURSE CONTENT:
Unit I: Education: Concept, Nature, and Purpose

Education as concept and its distinct nature; Classical, Liberalists and Progressivists view on Education; Analytical concept of education - education as a normative concept; Education as a family of Processes; Education as worthwhile activity; Cognitive and normative dimensions of education; Education and Educated person;
Education as System; Modes of education- formal, informal, non-formal;
Education and its related concepts- Training, Instruction and teaching
Education: Purpose(s) and Determinants - Determinants of Purpose-individual, Community, Religion, State and Market; Brief historical inquiry into purposes and determinants of education (from ancient India to contemporary India); social context of purposes of education
Education as a Discipline and Interdisciplinary in nature
Aims of Education from ancient to contemporary Indian society
Education as value development
Determinants of Aims of Education in emerging India

Unit II: Education and Socio-cultural context
Education as an instrument of social change; Influence of education on society and family; Socio-cultural influences on the aims of education; Emerging trends in societies and their influence on education
Education and Development
Globalization and Internationalization of education

Unit III: Educational thoughts and practices

Critical reflection on the educational thoughts of Indian and Western thinkers and on their relevance to the present education system

Indian: Mahatma Gandhi, Rabindranath Tagore, Aurobindo, Swami Vivekananada, Jiddu Krishnamurthy, Gijju Bhai Badheka; B R Ambedkar; Vinova Bhave

Western: Plato, Rousseau, John Dewey, Froebel, Montessori, Ivan Iliach, Paulo Frieri

Unit IV: Autonomy of Teacher and Learner

Autonomy: Meaning and extent

Teacher autonomy: Meaning, extent and nature; Teacher as autonomous professional; Areas of teacher autonomy: Their limit-situations - Curriculum making; Learning resources and material selection and use; Pedagogical practices; Assessment modalities; Limit-situations: Structures- Structured curriculum, and examination system; Time-tables;

Learner Autonomy: Meaning, extent and nature; Learning as an autonomous act; Meaning making and learners' autonomy-opportunities and constraints

Autonomy and Accountability: Teacher Accountability; Teacher commitment

Sessional Activities:

- Presentations on Educational thoughts of Various thinkers
- Preparation of an Album or posters on different thoughts of great thinkers
- Analysis of aims of education from ancient Vedic times to modern times
- Collection of examples/evidences to show the influence of Education on social change and the socio-cultural influences on Educational aims
- Comparative study of National curriculum frameworks of NCERT on aims of education
- Readings on Position paper on " Aims of Education"-NCF 2005
- Comparative study of Aims of Education of few countries
- Collection of case studies that exemplifies teacher accountability and commitment

References:

1. Alfred North Whitehead (1967), 'The Aims of Education and Other Essays', The McMilan Company, New York. .
2. Debra Hayes, Martin Hills, Pam Christie & Bob Lingard (2007) Teachers & Schooling: Making a Difference, Allen and Unwin, Australia.
3. Dewey, John (1938) Experience and Education Kappa Delta Pi, Indianapolis, USA
4. Diane Tellman (2000), Living Values: An Educational Program, Sterling Publishing Private Limited, USA.
5. Freiri, Paulo (1968). Pedagogy of the Oppressed, Sea burry Press, New York, USA
6. Hirst, Paul (1970). The Logic of Education, Taylor & Francis, London
7. JJ Rousseau, (1956) Emile
8. John S Brubacher, (1969) Modern Philosophies of Education. Tata McGraw Hill Pub., Co.,Pvt., Ltd, New Delhi.
9. Krishna Murthy, J. (1947) On Education, Orient Longman, New Delhi.
10. Mani, R.S. (1964). Educational Ideas and Ideals of Gandhi and Tagore, New Book Society, New Delhi.
11. Manoj Das (1999). Sri Aurobindo on Education, National Council for Teacher Education, New Delhi.
12. Margaret (1999). The Open Classroom: A Journey through Education, Orient Longman, New Delhi.
13. Mathur S.S. (1988). A Sociological Approach to Indian Education, Vinod Prakashan, Agra.
14. NCERT (2013). Basics in Education, National Council of Educational Research and Training,

New Delhi.
15. NCERT, (2005). National Curriculum Framework-2005. National Council of Educational Research and Training, New Delhi.
16. O'Connor,J (1958) Philosophy of Education, pub by Duke University Press on behalf of philosophical review.
17. Peters, R.S. (1967), The Concept of Education, Routledge, United Kingdom.
18. Peters, RS (1968). Ethics and education.(5th edn), George Allen & Unwin Ltd, London
19. Prema Clarke (2001). Teaching & Learning: The Culture of pedagogy, Sage Publication, New Delhi.
20. Scheffler, Israel (1966).Philosophy and Education: Modern Readings, Allyn and Bacon, Boston, US
21. Stella Van Petten Henderson (1960) Introduction to Philosophy, The University of Chicago press, Chicago.
22. Steven H. Cahn (1970). The Philosophical Foundation of Education, Harper & Row Publishers, New York.

BSE II.7:YOGA EDUCATION, SELF UNDERSTANDING AND DEVELOPMENT

Credits: 2 (1L+ 0T +1P) **Marks: 100**
Contact hrs per week: 3 **C1 + C2: 50**
Exam Duration: 2 hrs **C3: 50**

Objectives :

The student teacher will be able to:

- Understand the meaning and importance of self-concept and self-esteem.
- Be aware of different factors related to self-concepts and self-esteem. Record a brief history of development of yoga through the ages. Discuss how yoga and yoga practices are important for healthy living.
- Explain some important principles of yoga.
- Explain the different limbs of *Astañga* yoga.
- State the different types of yoga.
- Derive how Hatha yoga and *Astañga* yoga are complementary to each other.
- Enable the student to have good health.
- Practice mental hygiene.
- Possess emotional stability.
- Integrate moral values.
- Attain higher level of consciousness.
- Demonstrate some important *asanas* and *pranayama*.

COURSE CONTENT :

Unit I : Introduction to Yoga and Yogic Practices

Yoga: meaning and initiation, What is Yoga? Misconnects of Yoga, History of development of yoga, The streams of Yoga: Astanga yoga Raja yoga, Yogic practices for healthy living

Unit II Introduction to Yogic Texts

Historicity of yoga as a discipline, Classification of yoga and yogic texts, Hatha yogic practices, Meditational processes

Unit III: Yoga and Health

Need of yoga for positive health, Role of mind in positive health as per ancient yogic literature, Concept of health, healing and disease: yogic perspectives, Potential cause of ill health, Yogic principles of healthy living

Unit IV: Personality Development and Stress Management through Yoga

Yogic Practices for Personality Development : Surya Namaskar, Asanas : Tadasana, Simhasana, Kukkutasana, Akarna Dhanurasana, Matsyasana, Prnayama, Anuloma-Viloma Pranayama, Bhastrika Pranayama, Banda, Uddiyana Bandha, Dhyana (Meditation), Meditation, What is Stress, Yoga as a Way of Life for Stress Management: Ahara, Vihara, Achara, Vichara, Vyavahara, Yogic Practices for Stress Management; Asanas, Hastottanasana, Padahastasana, Trikonasana, Shashankasana, Ushtrasana, Ardhamatsyendrasana, Bhujangasana, Makarasana, Sarvangasana, Matsyasana, Shavasana; Pranayama, Anuloma-Viloma Pranayama, Bhastrika Pranayama, Bhramari Pranayama, Sheetali Pranayama; Meditation, Yoga for Healthy Living, Shirshasana, Bakasana, Hamsasana, Mayurasana

PRACTICALS

Exam Duration: 3 hrs **C_3 : 50 marks**

Practicum

General guidelines for performance of the practice of yoga for the beginners
Guidelines for the practice of *āsanas, prānāyāma and meditation*

- Select yoga practices for persons of average health for practical yoga sessions

5. Supine position
6. Prone position
7. Sitting position
8. Standing position
9. Mudras
10. Prānāyāmas

*** In addition, school and community based activities may be organised.**

Evaluation Strategies

The evaluation will be done through practicals/ assessment of ability to develop and design softwares for selected contents.

References:

1. Adair, J. and Allen, M. (1999). *Time Management and Personal Development.* London: Hawksmere.
2. NCERT (2015). Yoga: A Healthy Way of Living Upper Primary Stage, New Delhi (Also available in Hindi)
3. NCERT (2015). Yoga: A Healthy Way of Living Secondary Stage, New Delhi. (Also available in Hindi)
4. Rohrer, J. (2002). *ABC of Awareness.* Oberurnen: UTD Media.
5. Simanowitz, V. and Pearce, P. (2003). *Personality Development.* Beckshire: Open University Press.
6. Stevens, N. (2008). *Learning to Coach.* United Kingdom: How to books.

THIRD SEMESTER

Core Course 1 C : Physics

BSE III.1A :ELECTRICITY AND ELECTROMAGNETISM

Credits: 4 (3L+ 0T +1P) **Marks: 100**
Contact hrs per week: 5 **C1 + C2: 50**
Exam Duration: 2 hrs **C3: 50**

Objectives:

To enable students to acquire a broad conceptual framework of electrostatics electromagnetic phenomena.

COURSE CONTENT:

Unit I: Electrostatics

Electrostatic Field, electric flux, Gauss's theorem of electrostatics. Applications of Gauss's theorem- Electric field due to point charge, infinite line of charge, uniformly charged spherical shell and solid sphere, plane charged sheet, charged conductor. Electric potential as line integral of electric field, potential due to a point charge, electric dipole, uniformly charged spherical shell and solid sphere and continuous charge distributions (charged rod, ring, disk). Calculation of electric field from potential.

Unit II: Electric Fields in Matter and DC circuits

Capacitance of an isolated spherical conductor. Parallel plate, spherical and cylindrical condenser. Combination of capacitors, energy stored in a capacitor, Energy per unit volume in electrostatic field. Atomic view of dielectrics, Polarization, Displacement vector. Gauss's theorem in dielectrics. Dielectric constant, Parallel plate capacitor completely filled with dielectric. Polarizability and susceptibility, Clausius-Mossotti equation.
DC Circuits: Kirchhoff's laws, Voltage and Current dividers, Mesh analysis and Loop analysis, RC circuits, Maximum power transfer theorem.

Unit III: Magnetism

Magnetostatics: Biot-Savart's law and its applications- straight conductor, circular coil, solenoid carrying current. Magnetic force between two parallel current carrying conductors. The Divergence and Curl of **B**, Magnetic vector potential. Ampere's circuital law. Magnetic field due to a very long solenoid and a toroidal coil.

Magnetism in matter: Magnetic intensity, magnetic induction,, Magnetic susceptibility, permeability. Classification of magnetic substances- a brief introduction of dia-, para- and ferro-magnetic materials.

Unit IV: Electromagnetic Induction and AC Circuits

Electromagnetic Induction: Review of Faraday's law of induction, Lenz's law, Motional EMF. Inductance: Self inductance, energy in a magnetic field, magnetic energy density.

AC circuits: The *j* operator.sinusoidal voltage, current voltage relation in resistance, capacitance and inductance, Reactance and impedance, Power in AC circuits, RMS values, Power factor, LR and CR circuits. Series and parallel LCR circuits. Resonance. Mutual inductance and transformers.

Reference Books:

1. David J. Griffiths, Introduction To Electrodynamics, 4th Edition, Pearson
2. D C Tayal, Electricity and Magnetism, 1988, Himalaya Publishing House.
3. David Halliday, Robert Resnick and Jearl Walker, Fundamentals of Physics, 6th Edition, John Wiley, Inc.
4. A N Matveev, Electricity and Magnetism, Mir Publishers, Moscow.
5. F.W.Sears, Electricity and Magnetism, Addison Wesley Co.
6. A F Kipp, Fundamentals of Electricity and Magnetism, McGraw Hill.
7. Edward M. Purcell, Electricity and Magnetism, McGraw-Hill Education, 1986.
8. J.H. Fewkes & J. Yarwood, Electricity and Magnetism, Vol. I, Oxford Univ. Press, 1991.
9. Ronald Lane Reese, University Physics, 2003, Thomson Brooks/Cole.

PRACTICALS

Exam Duration: 3 hrs **C3: 50 Marks**

Objectives:

- To provide training in the broad methodology of science through investigatory type and open-ended laboratory exercises.
- To validate the theoretical basis of the experiments.

COURSE CONTENT:

(A minimum of TEN experiments to be selected from the following)

1. To study the variation of Magnetic field along the axis of a circular coil.
2. To determine M & H using deflection magnetometer & vibration magnetometer.
3. To determine horizontal component of Earth's magnetic field using a Tangent galvanometer.
4. To calibrate an ammeter using a potentiometer and Daniel cell.
5. Mapping of magnetic field due to a current carrying straight conductor.
6. Determination of resistance & resistivity using Meter Bridge.
7. Charging & Discharging of a Capacitor.

8. Deflection magnetometer-Tan A, Tan B positions.
9. Deflection magnetometer -Tan C Position-moment of moments.
10. Mapping of magnetic field lines for a current carrying solenoid.
11. Searle's vibration magnetometer-moment & ratio of moments.
12. Box type vibration magnetometer- M &B_h.
13. Caparison of emf and determination of internal resistance of a cell using a potentiometer.
14. Determination of resistance & resistivity using PO Box.
15. Comparison of capacitance by Desauty's bridge using BG.
16. Determination of frequency of AC mains using Sonometer & electromagnet.
17. Variation of phase angle with capacitance for a RC circuit.
18. Conversion of Galvanometer to Voltmeter.
19. Unknown resistance by Carey Foster bridge.
20. Induced emf.
21. Maximum power transfer theorem.
22. To verify the Thevenin's and Norton's theorem

References:

1. B.L.Flint & H.T.Worsnop, Advanced Practical Physics for students, Asia Publishing House, 1971.
2. E Armitage, Practical Physics, John Murray.
3. PSSC Physics Laboratory Guide.
4. S.Panigrahi & B.Mallick, Engineering Practical Physics, Cengage Learning India Pvt. Ltd., 2015
5. Indu Prakash and Ramakrishna, A Text Book of Practical Physics, 11th Edition, Kitab Mahal, New Delhi, 2011.
6. Jerry D Wilson and Cecilia A. Hernández-Hall Physics Laboratory Experiments7th Edition, Cengage Learning, 2009.
7. S.Panigrahi & B.Mallick, Engineering Practical Physics, Cengage Learning India Pvt. Ltd., 2015.
8. Michael Nelson and Jon M. Ogborn, Advanced level Physics Practicals, 4th Edition, reprinted, Heinemann Educational Publishers, 1985.

Core Course 1C :Botany

BSE III.1B :GYMNOSPERMS AND REPRODUCTIVE BIOLOGY OF ANGIOSPERMS

Credits: 4 (3L+ 0T +1P) **Marks: 100**
Contact hrs per week: 5 **C1 + C2: 50**
Exam Duration: 2 hrs **C3: 50**

Objectives:

- To acquaint students with the morphology, anatomy, reproduction and classification of Gymnosperms;
- To acquaint students with the structure, development and processes associated with Angiosperm embryology;

- To acquaint students with the techniques, branches and applications of plant tissue cultures.

COURSE CONTENT:

Unit I :

a) General characters, distribution, classification, affinities and economic importance of Gymnosperms
b) Study of morphology, anatomy and reproduction in Cycadopsida : Cycas, Cycadeoidea
c) Study of morphology, anatomy and reproduction in Coniferopsida : Pinus

Unit II:

a) Gnetopsida : Gnetum
b) Flower – Review of structure, morphology, embryological perspective.
c) Microsporangium – Development of wall layers, tapetal types, microsporogenesis, tetrad types.
d) Male gametophyte – Development and structure; vegetative and generative cells; male gametes.
e) Megasporangium (ovule): Development, types, megasporogenesis, tetrad types.
f) Female gametophyte : Development, ultrastructure, mono, bi and tetrasporic embryo sacs.

Unit III :

a) Pollination and fertilization : Definitions, types of pollination, pollen-pistil interaction, self-incompatibility, double-fertilization.
b) Endosperm : Definition, types – cellular, nuclear and helobial; endosperm haustoria.
c) Embryo : Classification, types, development of Crucifer type.

Unit IV :

a) Fruit and seed : Development, structure of monocot and dicot seeds, dispersal mechanisms, importance.
b) Brief account of apomixis and polyembryony.
c) Brief history, cellular totipotency, culture media and techniques.
d) Brief account of anther/ pollen culture, endosperm, embryo and protoplast culture, Applications of tissue culture.

References:

1. Sporne, K.R.,1974, Morphology of Gymnosperms, Hutchinson & Co., London.
2. Gangulee, S.C., Kar and Ashok Kumar, College Botany Vol.II, Central Book Agency, Calcutta.
3. Singh V., P.C.Pande & D K Jain 2006 Diversity and Systematics of Seed Plants, Rastogi Publications, Meerut.
4. Pandey, Mishra and Trivedi, 2000, A Text book of Botany Vol.II.
5. Chopra G.L.,1972, Gymnosperms, S. Nagin & Co., Jullandar.
6. Bhojwani S S and S P Bhatnagar, 2007. The Embryology of Angiosperms, Vikas Publishing House, Delhi.
7. Raven P.H, R.F.Evert and S.E.Eichhorn, 1999, Biology of Plants, 5th Ed., W.H.Freeman and Co., Worth Publishers, New York.

8. Swamy B.G.L. and K.V.Krishnamurthy, 1980, From Flower to Fruit, TMH Publishing House, New Delhi.
9. Johri B.M.(Ed.),1984, Embryology of Angiosperms, Springer-Verlag, Germany.

PRACTICALS

Exam Duration : 3 hrs **C3 : 50**

Objectives:
- To develop skills of free hand sectioning, staining and mounting Gymnosperm plant materials and embryological materials.
- To observe and identify temporary and permanent slides of Gymnosperms and Embryology.
- To acquaint students with procedures in plant tissue culture.

COURSE CONTENT:
1. Study of morphology, anatomy and reproductive structures of genera of Gymnosperms included in theory syllabus.
2. Study of structure of anther, microsporogenesis and pollen grains using permanent slides and mounts.
3. Study of structure of ovules and embryosac development (monosporic type) using permanent slides.
4. Examination of a wide range of flowers for study of pollination.
5. In vitro germination of pollen grains.
6. Preparation of culture medium and familiarization with tissue culture procedures.
7. Mounting the endosperm of Cucumis and embryos of Crotalaria.

Core Course 2C Chemistry

BSE III.2 :ORGANIC CHEMISTRY – I

Credits: 4 (3L+ 0T +1P) **Marks: 100**
Contact hrs per week: 5 **C1 + C2: 50**
Exam Duration: 2 hrs **C3: 50**

Objectives:
- To review the concept of isomerism and its types
- To develop an understanding of chemistry of hydrocarbons and their halogenated derivatives.

COURSE CONTENT:
Unit I: Stereochemistry of Organic Compounds
Review of Concept of Isomerism and Types of isomerism with examples.

Optical Isomerism: Structural changes responsible for properties: elements of symmetry, molecular chirality, enantiomers, stereogenic centre, optical activity, properties of enantiomers, chiral and achiral molecules with two stereogenic centres, diastereomers, threo and erythro diastereomers, meso compounds, resolution of enantiomers, inversion, retention and racemization and asymmetric synthesis.
Relative and absolute configuration, sequence rules, D & L and R & S systems of nomenclature.

Geometric isomerism: Determination of configuration of geometric isomers. Cis – trans and E & Z system of nomenclature, geometric isomerism in oximes and alicyclic compounds.

Conformational isomerism: Difference between configuration and conformation. Conformational analysis of ethane and n-butane; conformations of cyclohexane, axial and equatorial bonds, conformation of mono alkyl substituted cyclohexane derivatives. Review of Newman projection and Sawhorse formulae, Fischer and flying wedge formulae.

Unit II: Aliphatic Hydrocarbons

Alkanes: Review of IUPAC nomenclature of branched and unbranched alkanes. Isomerism in alkanes and industrial source. Methods of formation (with special reference to Wurtz reaction, Kolbe reaction, Corey-House reaction and decarboxylation), physical properties and chemical reactions of alkanes (halogenation, nitration, sulphonation, oxidation and isomerisation reactions) Mechanism of free radical halogenation of alkanes: orientation, reactivity and selectivity.

Cycloalkanes: Nomenclature, methods of formation (from acetoacetic ester / malonic ester and Dieckmann reaction), chemical reactions (halogenation), Baeyer's strain theory and its limitations. Ring strain in small rings (cyclopropane and cyclobutane), theory of strainless rings. The case of cyclopropane ring: banana bonds.

Alkenes: Accounting for Reactions due to unsaturation in compounds. Nomenclature of alkenes, methods of formation (by dehydration, dehydrohalogenation and dehalogenation) with mechanism. Regioselectivity in alcohol dehydration. The Saytzeff rule, Hofmann elimination, physical properties and relative stabilities of alkenes. Chemical reactions of alkenes – mechanism of hydrogenation, electrophilic and free radical additions, Markownikoff's rule, hydroboration followed by oxidation, oxymercuration – reduction. Epoxidation, ozonolysis, hydration, hydroxylation and oxidation with $KMnO_4$. Polymerization of Alkenes. Substitution at the allylic and vinylic positions of alkenes.

Cycloalkenes: Methods of formation and chemical reactions of cycloalkenes.

Alkadienes: Nomenclature and classification of dienes: Isolated, conjugated and cumulated dienes. Structure of allenes and butadiene, methods of formation, polymerization. Chemical reactions – 1,2 and 1,4 additions. Diels-Alder reaction.

Alkynes: Nomenclature, structure and bonding in alkynes. Methods of formation (alkylation of acetylene and by elimination reactions). Acidity of alkynes. Chemical reactions of alkynes: Mechanism of electrophilic and nucleophilic addition reactions, hydroboration, oxidation, metal-ammonia reductions, oxidation and polymerization.

Unit III: Aromatic Hydrocarbons

Factors responsible for the characteristic reactions of Aromatic compounds. Nomenclature of benzene derivatives. Structure of benzene: molecular formula and Kekule structure. Stability and carbon-carbon bond lengths of benzene, resonance structure, MO picture. Aromaticity: The Huckel rule, aromatic ions.

Aromatic electrophilic substitution: General pattern of the mechanism, role of σ- and π-complexes. Mechanism of nitration, halogenation, sulphonation, mercuration and Friedel-Crafts reaction. Energy profile diagrams. Activating and deactivating substituents, orientation and ortho/ para ratio. Side chain reactions of benzene derivatives. Birch reduction.

Methods of formation and chemical reactions of alkylbenzenes, alkynylbenzenes and biphenyl.

Unit IV:Alkyl and Aryl Halides

Alkyl halides: A study of Alkyl halides highlighting its synthetic applications. Nomenclature and classes of alkyl halides, methods of formation, chemical reactions. Mechanism of nucleophilic substitution reactions of alkyl halides S_N2 and S_N1 reactions with energy profile diagrams. Polyhalogen compounds: chloroform, carbon tetrachloride.

Aryl halides: Methods of formation of aryl halides, nuclear and side chain reactions. The addition- elimination and the elimination-addition mechanisms of nucleophilic aromatic substitution reactions.

Relative reactivities of alkyl halides vs allyl, vinyl and aryl halides. Synthesis and uses of DDT and BHC.

References :

1. Organic Chemistry : Seyhand N Ege
2. Organic Chemistry : Morrison and Boyd
3. Organic Chemistry : I L Finar
4. Organic Chemistry : Hendricson, Cram and Hammond
5. Organic Chemistry : Stanley H. Pine

PRACTICALS

Exam Duration : 3 hrs **C3 : 50**

Objective:

To develop basic skills in organic synthesis and purification of organic compounds

COURSE CONTENT:

1. Calibration of Thermometer using naphthalene / acetanilide / urea
2. Determination of melting point of Benzoic acid / cinnamic acid / m – dinitro benzene / p-dichlorobenzene
3. Determination of boiling point of aniline / nitrobenzene / chlorobenzene
4. Distillation of water – alcohol mixture using water condenser; Distillation of chlorobenzene –nitrobenzene mixture using air-condenser

5. Cystallization: Benzoic acid from hot water, naphthalene from ethanol
6. Sublimation of camphor / phthalic acid / succinic acid

Organic synthesis:

1. Preparation of Iodoform from ethanol / acetone using sodium hypochlorite and KI
2. Preparation of *m*-dinitrobenzene from nitrobenzene by nitration
3. Preparation of *p*-bromoacetanilide from acetanilide by bromination
4. Preparation of 2,4,6-tribromo phenol from phenol / 2,4,6-tribromoaniline from aniline
5. Preparation of Acetanilide from aniline by acetylation
6. preparation of benzoic acid from benzamide by base hydrolysis
7. preparation of aspirin from salicylic acid by acetylation
8. preparation of p-bromoaniline from acetanilide
9. preparation of 0-iodobenzoic acid from anthranilic acid
10. preparation of p-nitroacetanilide from acetanilide by nitration

References :

A Text Book of Qualitative organic Analysis, A .I . Vogel

Core Course 3 C : Mathematics

BSE III.3A : REAL ANALYSIS

Credits: 4 (3L+ 1T +0P) **Marks: 100**
Contact hrs per week: 5 **C1 + C2: 50**
Exam Duration: 2 hrs **C3: 50**

Objectives:

At the end of the course students will be able to understand the concepts of real number system, real sequences, infinite series and the convergence tests. Also understand the concept of Riemann integration and its properties.

COURSE CONTENT:

Unit I:

The field axioms; Theorems about field properties, Order in R-Absolute value, Completeness, some important subsets, Intervals, Countable and Uncountable sets. Neighborhoods, Open Sets, Closed Sets, Limit points of a set, Closure of a set, Interior of a set, Compactness, Connectedness.

Unit II:

Introduction to sequences, Convergent sequences, Divergent sequences, Oscillatory sequences, Bounded sequences, Some important limit theorems, Cauchy sequences, Monotonic sequences, Cluster points of a sequence, Limit superior and limit inferior of a sequence, Subsequences.

Unit III:

Introduction to Infinite Series, Sequence of partial sums of a series, Convergent series, Cauchy's general principle of Convergence for Series, A necessary condition for

convergence, Series of positive terms, A fundamental result for series of positive terms, Geometric series, Comparison test, Cauchy's nth root test, D'Alembert's Ratio test, Raabe's test, Maclaurin's integral test.

Unit IV:
Riemann Integration: Upper and lower sums, Criterion for inerrability, Inerrability of continuous functions and monotone functions, Fundamental theorem of Calculus, Change of variables, Integration by parts, First and Second Mean Value Theorems of Integral Calculus.

References:

1. Real Analysis by J.M.Howie, Springer 2007.
2. Real Analysis by Malik, Wiley Eastern.
3. Mathematical Analysis by Shanthinarayan, S. Chand and Co. Ltd.
4. Mathematical Analysis by Malik and Savita Arora, New Age International Pvt. Ltd.
5. Real Analysis by Royden, Prentice Hall of India Pvt. Ltd.
6. Mathematical Analysis by T M Apostal, Addison Wesley, Narosa, New Delhi, 2nd Edition.
7. Introduction to Real Analysis by Bartle R G & Sherbert , Wiley India
8. Kumar Ajit & Kumaresan S, *Real Analysis*, CRC Press
9. Principles of Mathematical Analysis by Walter Rudin, 2nd Edition, McGraw Hill Book Company, 1984.
10. Analysis I and II, Torence Tao, Hindustan Book Agency, India, 2006.
11. Elementary Analysis – The Theory of Calculus, Kenneth A Ros, Springer International Edition, 2004.
12. Real Functions by G. Goffman.
13. Principles of Real Analysis by Malik, New Age International Ltd.
14. Textbook of Mathematical Analysis by Leadership Project, Bombay University, Tata McGraw Hill Publishing Media Pvt. Ltd.

Core Course 3 C : Zoology

BSE III.3B :ANIMAL DIVERSITY–III AND COMPARATIVE ANATOMY

Credits: 4 (3L+ 0T +1P) **Marks: 100**
Contact hrs per week: 5 **C1 + C2: 50**
Exam Duration: 2 hrs **C3: 50**

OBJECTIVES*:*
- To acquaint students with the diversity that exists in vertebrates
- To understand their organizational hierarchies and complexities;
- To understand the external morphology and internal structure; identification and classification with examples;
- To enable them to understand various modes of adaptations in animals
- To compare the anatomy among different vertebrates
-

COURSE CONTENT:

UNIT I: Histology, Pisces and Amphibia

a) **Histology:** Epithelial, connective, muscular and nervous tissues

b) **Pisces:** General Characters and Classification of Superclass Pisces up to orders with examples; Comparison of chondrichthyes and Osteichthyes; External morphology of *Scoliodon*; Dipnoi and its affinities.

c) **Amphibia:** General characters and classification up to orders with examples, Parental care in Amphibia

UNIT II: Reptilia, Aves and Mammalia

a) **Reptilia:** General Characters and Classification of classes up to orders with examples; Evolution of Temporal fossae; Poisonous and non-poisonous snakes; Poison apparatus and biting mechanism in snakes.

b) **Aves:** General Characters and classification up to orders, Flight adaptation and migration in birds.

c) **Mammalia:** General Characters and Classification of the class Mammalia up to orders with examples, Affinities of Prototheria and Metatheria; Adaptations in Primates; Autonomic nervous system of mammals.

UNIT III: Comparative Anatomy of Vertebrates–I

Comparative study in chondrichthyes, amphibians, reptiles, birds and mammals:

a) Digestive system
b) Respiratory system
c) Structure of heart
d) Circulatory system
e) Aortic arches

UNIT IV: Comparative Anatomy of Vertebrates–II

a) Comparative study in Chondrichthyes, amphibians, reptiles, birds and mammals:
   i) Nervous system (Brain, cranial nerves, spinal cord and spinal nerves)
   ii) Sense organs (eye and ear)
   ii) Urinogenital system

b) Integument: scales of fishes; feather-types and structure of quill feather; mammalian skin

References:

1. Modern Textbook of Zoology: Vertebrates by R.L. Kotpal – Rastogi Publications, Meerut, 3rd edition, 2008.
2. A Text Book of Zoology Vol.II by Parkar and Hasswel – (MacMillan).
3. A Text Book of Zoology Vol.II by R.D.Vidyarthi– (S. Chand & Co., Delhi).
4. Life of Vertebrates by J.Z.Young – (Oxford University Press).
5. The Vertebrate Body by A.S.Romer – (Vakils, Ferrer& Simons, Bombay).
6. Elements of Chordate Anatomy by Weichert – (McGraw Hill).
7. The Birds by R.L Kotpal (4th edition) – (Rastogi Publications, 2008).
8. Bird Migration by D.R. Griffin – (Doubleday, Garden City, USA).
9. The Book of Indian birds by Salim Ali
10. Comparative anatomy of the vertebrates by George C Kent – 3rd saint Louis: The C.V. Mosby Company, 1973.

11. Histology by A.K. Berry

PRACTICALS

Exam Duration : 3 hrs **C3 : 50**

Objectives:
To develop in students the skills of:

- Staining and mounting of materials (temporary and permanent);
- Microtechniques (fixing, embedding, section cutting, staining and mounting);
- Preparation of cultures of invertebrates by using common culture methods;
- Laboratory observation of animal specimens;

COURSE CONTENT:

1. Study of specimens of Chondrichthyes:
   a) *Stegostoma b) Sphyrna c) Narcine d) Trygon e) Torpedo*
2. Study of specimens of bony fish:
   a) *Echeneis* *b) Exocoetus* *c) Clarias* *d) Anabas*
   e) Anguilla *f*) Lungfish g) *Hippocampus*
3. Mounting of fish scales:
   a) Placoid scales b) Ctenoid/Cycloid scales
4. Study of *Scoliodon*:
   a) Afferent and efferent branchial system.
   b) Cranial nerves (5th, 7th, 9th and 10th)
   c) Membraneous labyrinth (ear canal)
5. Study of specimens of Amphibians:
   a) *Ichthyophis* *b) Bufo* *c)Ambystoma* *d)*Axolotl larva
6. Study of specimens of Reptilia:
   a) Tortoise/Turtle/terrapin *b) Gecko* *c) Varanus*
7. Identification of poisonous and non-poisonous snakes:
   a) *Hydrophis* b) *Vipera russelli* c) *Naja naja* d) *Bungarus* e) *Dhaman*
   f) *Dryophis* *g) Typhlops*
8. Osteology:
   a) Study of skulls of Frog/Varanus/Bird/Rabbit
   b) Study of fore and hind limb bones of Frog, Varanus/Calotes, Bird and Rabbit
   c) Study of pectoral and pelvic girdles of Frog, Varanus/Calotes, Bird and Rabbit
   d) Study of different types of vertebrae of frog and mammal
9. Local field visit to identify and classify 10 common birds and mammals; submission of report
10. Study of tissues: Epithelial, muscular, T.S. of bone and cartilage
11. Microtomy: Fixing, Block making, Section cutting, Double Staining, mounting and submission of slides.

Skill Enhancement Course- 1 Physics

BSE III.4A :BASIC INSTRUMENTATION SKILLS

Credits: 3 (2L+ 0T +1P) **Marks: 100**
Contact hrs per week: 5 **C1 + C2: 50**
Exam Duration: 2 hrs **C3: 50**

Objectives:

To get exposure with various aspects of instruments and their usage through hands- on mode.

COURSE CONTENT:

Unit I: Basic of Measurement

Instruments accuracy, precision, sensitivity, resolution range etc. Errors in measurements and loading effects. Multimeter: Principles of measurement of dc voltage and dc current, ac voltage, ac current and resistance. Specifications of a multimeter and their significance.
Electronic Voltmeter: Advantage over conventional multimeter for voltage measurement with respect to input impedance and sensitivity. Principles of voltage, measurement (block diagram only). Specifications of an electronic Voltmeter/ Multimeter and their significance. AC millivoltmeter: Type of AC millivoltmeters: Amplifier- rectifier, and rectifier- amplifier. Block diagram ac millivoltmeter, specifications and their significance.

Unit II: Cathode Ray Oscilloscope and its uses

Block diagram of basic CRO. Construction of CRT, Electron gun, electrostatic focusing and acceleration (Explanation only– no mathematical treatment), brief discussion on screen phosphor, visual persistence & chemical composition. Time base operation, synchronization. Front panel controls. Specifications of a CRO and their significance. Use of CRO for the measurement of voltage (dc and ac frequency, time period. Special features of dual trace, introduction to digital oscilloscope, probes. Digital storage Oscilloscope: Block diagram and principle of working.

Unit III:

Signal Generators and Analysis Instruments: Block diagram, explanation and specifications of low frequency signal generators. pulse generator, and function generator. Brief idea for testing, specifications. Distortion factor meter, wave analysis.
Impedance Bridges & Q-Meters: Block diagram of bridge. working principles of basic (balancing type) RLC bridge. Specifications of RLC bridge. Block diagram & working principles of a Q- Meter. Digital LCR bridges.

Unit IV:

Digital Instruments: Principle and working of digital meters. Comparison of analog & digital instruments. Characteristics of a digital meter. Working principles of digital voltmeter.
Digital Multimeter: Block diagram and working of a digital multimeter. Working principle of time interval, frequency and period measurement using universal counter/ frequency counter, time- base stability, accuracy and resolution.

References :

1. B L Theraja, A text book in Electrical Technology, S Chand and Co.
2. M.G. Say, Performance and design of AC machines, ELBS Edn. CBS Publishers & Distributors,2005.
3. Venugopal, Digital Circuits and systems, Tata McGraw Hill, 2011.
4. Shimon P. Vingron, Logic circuit design, Springer, 2012.
5. Subrata Ghoshal, Digital Electronics, Cengage Learning, 2012.
6. S. Salivahanan & N. S.Kumar, Electronic Devices and circuits, 3rd Ed., Tata Mc-Graw Hill, 2012.
7. U.Tietze, Ch.Schenk, Electronic circuits: Handbook of design and applications, Springer, 2008.
8. Thomas L. Floyd, Electronic Devices, Pearson India, 2008.

PRACTICALS

Exam Duration: 3 hrs **C3: 50 Marks**

Objectives:

To get exposure with various aspects of instruments and their usage through hands- on mode.

COURSE CONTENT:

(A minimum of EIGHT experiments to be selected from the following)

1. Circuit tracing of a given laboratory electronic equipment.
2. Use of Digital multimeter/VTVM for measuring voltages.
3. Winding a coil / transformer.
4. Study the layout of receiver circuit.
5. Trouble shooting a circuit.
6. To observe the loading effect of a multimeter while measuring voltage across a low resistance and high resistance.
7. To observe the limitations of a multimeter for measuring high frequency voltage and currents.
8. To measure Q of a coil and its dependence on frequency, using a Q- meter.
9. Measurement of voltage, frequency, time period and phase angle using CRO.
10. Measurement of time period, frequency, average period using universal counter/ frequency counter.
11. Measurement of rise, fall and delay times using a CRO.
12. Measurement of distortion of a RF signal generator using distortion factor meter.
13. Measurement of R, L and C using a LCR bridge/ universal bridge.

References:

1. B L Theraja, A text book in Electrical Technology, S Chand and Co.
2. M.G. Say, Performance and design of AC machines, ELBS Edn. CBS Publishers & Distributors, 2005.
3. Venugopal, Digital Circuits and systems, Tata McGraw Hill, 2011.
4. Shimon P. Vingron, Logic circuit design, Springer, 2012.
5. Subrata Ghoshal, Digital Electronics, Cengage Learning, 2012.
6. S. Salivahanan & N. S.Kumar, Electronic Devices and circuits, 3rd Ed., Tata Mc-Graw Hill, 2012.
7. U.Tietze, Ch.Schenk, Electronic circuits: Handbook of design and applications, Springer, 2008.
8. Thomas L. Floyd, Electronic Devices, Pearson India, 2008.
9.

Skill Enhancement Course 1 - Botany

BSE III.4B :PLANT PROPAGATION, NURSERY AND GARDENING

Credits: 3 (2L+ 0T +1P) **Marks: 100**
Contact hrs per week: 5 **C1 + C2: 50**
Exam Duration: 2 hrs **C3: 50**

Objectives:
After completing the course students will be able to:

- Plan and manage a garden
- Cultivate vegetables in kitchen gardens
- Multiply plants through appropriate techniques
- Identify seeds and garden plants

COURSE CONTENT:

Unit I
Vegetative propagation: air-layering, cutting, selection of cutting, collecting season, treatment of cutting, rooting medium and planting of cuttings - Hardening of plants - green house - mist chamber, shed root, shade house and glass house.

Unit II
Nursery: Definition, objectives and scope and building up of infrastructure for nursery, planning and seasonal activities - Planting - direct seeding and transplants.

Unit III
Seed: Structure and types - Seed dormancy; causes and methods of breaking dormancy - Seed storage: Seed banks, factors affecting seed viability, genetic erosion - Seed production technology - seed testing and certification.

Unit IV

A. Gardening: Definition, objectives and scope - different types of gardening - landscape and home gardening - parks and its components - plant materials and design - computer applications in landscaping - Gardening operations: soil laying, manuring, watering, management of pests and diseases and harvesting.

B. Sowing/raising of seeds and seedlings - Transplanting of seedlings - Study of cultivation of different vegetables: cabbage, brinjal, lady's finger, onion, garlic, tomatoes, and carrots - Storage and marketing procedures.

PRACTICAL

Exam Duration : 3 hrs **C3 : 50**

COURSE CONTENT:

1. Identification of common agricultural tools and implements.
2. Demonstration and practice of different methods of plant propagation
3. Raising a floral nursery, soil bed preparation, transplantation and maintenance of garden
4. Identification of seeds of common garden plants, crop plants and vegetables.
5. Steps in the Preparation of pots for planting, maintenance of pots
6. Methods of breaking seed dormancy
7. Visit to Brindavan garden, Zoo garden and parks in Mysore for study and preparation of report.

References:

1. Bose T.K. & Mukherjee, D., 1972, Gardening in India, Oxford & IBH Publishing Co., New Delhi.
2. Sandhu, M.K., 1989, Plant Propagation, Wile Eastern Ltd., Bangalore, Madras.
3. Kumar, N., 1997, Introduction to Horticulture, Rajalakshmi Publications, Nagercoil.
4. Edmond Musser & Andres, Fundamentals of Horticulture, McGraw Hill Book Co., New Delhi.
5. Agrawal, P.K. 1993, Hand Book of Seed Technology, Dept. of Agriculture and Cooperation, National Seed Corporation Ltd., New Delhi.
6. Janick Jules. 1979. Horticultural Science. (3rd Ed.), W.H. Freeman and Co., San Francisco, USA.

Skill Enhancement Course 1 :Chemistry

BSE III.4C :INDUSTRIAL CHEMICALS AND ENVIRONMENT

Credits: 3 (2L+ 0T +1P) **Marks: 100**
Contact hrs per week: 5 **C1 + C2: 50**
Exam Duration: 2 hrs **C3: 50**

Objectives:

- To understand the basic techniques of chemical industry
- To gain idea about the energy sources
- To understand the properties and application of lubricants
- To study the effects of green house phenomena
- To study the water quality parameter and waste water management
- To acquire the basic knowledge about commom pesticides

COURSE CONTENT:

Unit I:

Chemical Technology: Basic principles of distillation, solvent extraction, solid-liquid leaching and liquid-liquid extraction, separation by absorption and adsorption. An introduction into the scope of different types of equipment needed in chemical technology, including reactors, distillation columns, extruders, pumps, mills, emulgators. Scaling up operations in chemical industry. Introduction to clean technology.

Unit II:

Fuel Chemistry: Review of energy sources (renewable and non-renewable). Classification of fuels and their calorific value.

Coal: Uses of coal (fuel and non fuel) in various industries, its composition, carbonization of coal. Coal gas, producer gas and water gas—composition and uses. Fractionation of coal tar, uses of coal tar bases chemicals, requisites of a good metallurgical coke, Coal gasification (Hydro Gasification and Catalytic gasification), Coal liquefaction and Solvent Refining.

Petroleum and Petrochemical Industry: Composition of crude petroleum, Refining and different types of petroleum products and their applications. Fractional Distillation (Principle and process), Cracking (Thermal and catalytic cracking), Reforming Petroleum and non-petroleum fuels (LPG, CNG, LNG, bio-gas, fuels derived from biomass), fuel from waste, synthetic fuels (gaseous and liquids), clean fuels. Petrochemicals: Vinyl acetate, Propylene oxide, Isoprene, Butadiene, Toluene and its derivatives Xylene.

Lubricants: Classification of lubricants, lubricating oils (conducting and non-conducting) Solid and semisolid lubricants, synthetic lubricants. Properties of lubricants (viscosity index, cloud point, pore point) and their determination.

Unit III:

Air Pollution: Pollutants and their sources, pollution by SO2, CO2, CO, NOx, H2S and other foul smelling gases. Methods of estimation of CO, NOx, SOx and control procedures. Green

House effect and Global warming, Ozone depletion by oxides of nitrogen, chlorofluorocarbons and Halogens, removal of sulphur from coal. Control of particulates.

Water pollution and Water Quality Standards: Pollutants and their sources, Effluent treatment plants (primary, secondary and tertiary treatment). Industrial effluent from the following industries and their treatment: electroplating, textile, tannery, dairy, petroleum and petrochemicals, agro, fertilizer, etc. Sludge disposal. Industrial waste management, incineration of waste. Water treatment and purification (reverse osmosis, electro dialysis, ion exchange). Water quality parameters for waste water, industrial water and domestic water.

Unit IV:

Pesticides General introduction to pesticides (natural and synthetic), benefits and adverse effects, changing concepts of pesticides, structure activity relationship, synthesis and technical manufacture and uses of representative pesticides in the following classes: Organochlorines (DDT, Gammexene,); Organophosphates (Malathion, Parathion); Carbamates (Carbofuran and carbaryl); Quinones (Chloranil) , Anilides (Alachlor and Butachlor).

PRACTICAL

Exam Duration : 3 hrs **C3 : 50**

Objectives:

- To monitor the water quality parameters
- To prepare simple industrial products
- To analyse food adulterants

COURSE CONTENT:

1. Determination of dissolved oxygen in water.
2. Determination of Chemical Oxygen Demand (COD)
3. Determination of Biological Oxygen Demand (BOD)
4. Percentage of available chlorine in bleaching powder.
5. Measurement of chloride, sulphate and salinity of water samples by simple titration method.
   ($AgNO_3$ and potassium chromate)
6. Estimation of total alkalinity of water samples (CO_3, HCO_3) using double titration method.
7. Preparation of borax/ boric acid.
8. To calculate acidity/alkalinity in given sample of pesticide formulations as per BIS specifications.
9. Preparation of simple organophosphates, phosphonates and thiophosphates
10. Preparation of Magnesium bisilicate (Antacid).
11. Preparation of soap.
12. Testing of mercuric powder, milk powders, mustard oil for adulterants.

References:

1. E. Stocchi: Industrial Chemistry, Vol -I, Ellis Horwood Ltd. UK.

2. P.C. Jain, M. Jain: Engineering Chemistry, Dhanpat Rai & Sons, Delhi.
3. B.K. Sharma: Industrial Chemistry, Goel Publishing House, Meerut.
4. G.L. Patrick: Introduction to Medicinal Chemistry, Oxford University Press, UK.
5. R. Cremlyn: Pesticides, John Wiley. 7. William O. Foye, Thomas L., Lemke , David A. William:
6. O. P. Vermani, A. K. Narula: Industrial Chemistry, Galgotia Publications Pvt. Ltd., New Delhi.
7. S. C. Bhatia: Chemical Process Industries, Vol. I & II, CBS Publishers, New Delhi.
8. P. C. Jain, M. Jain: Engineering Chemistry, Dhanpat Rai & Sons, Delhi.
9. R. Gopalan, D. Venkappayya, S. Nagarajan: Engineering Chemistry, Vikas Publications, New Delhi. 10. B. K. Sharma: Engineering Chemistry, Goel Publishing House, Meerut.

Skill Enhancement Course 1 : Mathematics

BSE III.4D : COMBINATORICS, STATISTICS AND BASIC PROBABILITY

Credits :3 (2L + 1T + 0P) **Marks: 100**
Contact hrs per week: 4 **C1 + C2: 50**
Exam Duration : 2 hrs **C3 : 50**

Objectives:
To enable the students to understand the basic concepts of combinatorics, statistics and probability, to obtain the skills and apply them in problem-solving and teaching.

COURSE CONTENT:
Unit I:
Partially ordered sets, Lattices, Complete lattices, Distributive lattices, Complements, Boolean Algebra, Boolean expressions, Application to switching circuits.

Unit II:
Permutations and Combinations, Pigeon-hole principle, Principle of inclusion and exclusion. Solving real life problems based on them.

Unit-III:
Introduction to statistics, Mean, Mode and Median of grouped and ungrouped data, Graphical representations; Pie Charts, Line Graphs, Bar Graphs, Histographs, frequency polygon. Measures of dispersion; Range, Mean deviation, Variance and Standard deviation, Analysis of frequency distribution.

Unit-IV: Random experiment, Concept of probability, Sample space, Events- different kinds Probability definitions – Mathematical or Classical or Statistical, Conditional probability, Independent events, Baye's theorem.
Random variable, Discrete and continuous random variables, Probability function, Probability density function, Distribution function. Mean Variance and standard deviation of a random variable.

References:

1. Elements of Discrete Mathematics by C. L. Liu , McGraw-Hill, 1986.
2. Discrete Mathematics and its Applications by Kenneth H. Rosen, McGraw-Hill, 2002.
3. Introduction to the Theory of Statistics by Alexander M. Mood and Others (1988), New York, McGraw Hill.
4. Introduction to Probability by Charles M. Grinstead and Laurie Snell J. (1991), Rhode Island, American Mathematical Society.
5. Fundamentals of Mathematical Statistics by Gupta S.C and Kapur (2011), New Delhi, Sultan Chand and Co.
6. Basic Probability Problems by Richard Serfozo (2003), London, Springer.
7. Introduction to Mathematical Statistics by Robert V. Hogg and Allen T. Craig (1978), McMillan Publishing Co.

Skill Enhancement Course 1: Zoology

BSE III.4E :APICULTURE

Credits: 3 (2L + 0T + 1P) **Max. Marks: 100**
Contact Hrs per Week:2 hrs **C1+C2: 50**
Exam. Duration: 2 hrs **C3: 50**

Objectives:

- Impart education about techniques in beekeeping,
- to inculcate and sharpen the observation skill to enjoy the wonders of nature
- to understand the social life of honey bees, management and their importance to man
- to learn the uses of hive products and biopesticides
- to learn the technique of processing and preserving of honey, its economic and medicinal value
- to understand the diseases of honeybees and propylatic measures.
- to develop enterpreneural skills in beekeeping

UNIT I :
Introduction to Apiculture, history, importance of bee keeping, b) Types of bee hives, floral calander, bee biology and behavior, c) Role of bees in Pollination.

UNIT II:
Study of morphology of honey bees (workers drones and queen bees), b) Reproduction in honey bees, Bee hives, types of beehive boxes, selection of bee hive equipment, Populating and management of bee colony.

UNIT III:
Composition and types of honey, Different methods of collecting honey. Harvesting quality honey, Hive products.

UNIT IV:

Bee pests, predators and diseases and propylatic methods, Economics of bee keeping, Medicinal importance of honey.

PRACTICAL

Exam Duration : 3 hrs **C3 : 50**

Objectives:

- To provide the hands-on experience in Bee Keeping practices
- To understand the importance of Honey Bees in environment
- To appreciate the modern technology employed in Bee Keeping

COURSE CONTENT:

1. Collect different species of honey bees
2. Study the morphology of worker drone and queen bees.
3. Study different types of hive boxes
4. Study the life cycle of honey bees
5. Extraction of honey – different methods
6. Study on predators on Honey bees
7. Dealing with robber bees

Visit to Apiaries at Mysore and agriculture universities to study the new techniques in bee keeping

References:

1. The complete book on BEE keeping and honey Processing (2nd revised edition) NPCS Board , Published by: NIIR project consultancy services
2. A practical manual of beekeeping by David Cramp (spring Hill)
3. Beekeeping in India; Ghosh G K; APH Publishing 1994
4. Beekeeping in India; Sardar Singh; ICAR 1982
5. Bees for Development (2010). Beekeeping Training modules. Honey bee colony management. Monmouth- UK.
6. Dadant and Sons. (1992**)**. The Hive and the Honeybee. Extensively rivised. Dadant and Sons. Hamilton,Illinois.
7 ABC of Beekeeping problems and problem Beekeepers By William Dullas.
8. Fundamentals of Beekeeping by Clarence H Collison ;Pennsylvania State University
9. The biology of stingless Bees by Hayo H. W. Vethuis
10. Mugume, A.(2009). Beekeeping Training Notes. Kabarole DLG. Fortportal - Uganda.
11. Beescape of maliponines: Conservation of Indo- Malayan stingless bees By Abu Hassan Jalil, Ibrahim huib M B; B S (Malaya)
12 Diseases and hygienic Behavior in Honey bees and stingless bees by University of Sheffield.
13. National Bee keeping training and extension manual, 2012

PROFESSIONAL EDUCATION COURSES

BSE III.5: CHILDHOOD AND GROWING UP

Credits: 4 (3L+ 1T +0P) **Marks: 100**
Contact hrs per week: 5 **C1 + C2: 50**
Exam Duration: 2 hrs **C3: 50**

Objectives

The student teacher will be able to:

- Understand the salient features and problems of growth and development during childhood to adolescence.
- Understand the dynamics of personality development in order to facilitate student trainees' and their students' personal growth.
- Develop the ability to apply the knowledge provided by Educational Psychology to classroom problems of various kinds.
- Understand the intra and inter individual differences in the learners and their Implications for organizing educational programmes.
- Acquire the skills of understanding the needs of all the learners in the classroom and meeting their needs.
- Appreciate the contribution of psychology in realizing the objectives of education.

COURSE CONTENT

Unit I : Nature of Human Development and Educational Implications

Concept and Branches of Psychology; Importance of Study of Psychology by Classroom Teachers, Meaning of Growth and Development. Differences between growth and development, importance of growth and development for the teachers. Principles of Development, Factors Influencing Growth and Development; Role of Heredity and Environment in Determining individual Differences in Development. Developmental Stages and Tasks, Development during Early Childhood, Late Childhood and Adolescence-Characteristics, Factors Influencing and Educational Implications:(a) Physical (b) Psychomotor (c) Intellectual (d) Language (e) Emotional (f) Social and (g) Moral and Value Development

Unit II : Management of Issues and Concerns of Adolescent Students

Factors Affecting Adolescent development; Issues and Concerns during Adolescence - Physical and Health concerns, Emotional Issues, Social Issues, Socio-cultural diversity, Adverse Life experiences, Identity Vs Role Confusion; Adolescent Cognition and its effect on Adjustment, Need and Importance of Adolescence Education, Significance of Life Skill Education for Adolescence, Role of Schools for the Balanced Personality

Unit III: Individual Differences in Learners

Individual Differences in - Psycho-Motor skills, Intelligence, Aptitude, Personality, Learning styles and Cognitive Preferences, Self concept and Self esteem, Social-Emotional Development, Aptitude, Interest, Attitude and Values and Study Habits.

Unit IV :Assessment of Individual and Intra Individual Differences in Learners

Tools and Techniques: Psychological Tests, Observation Schedules, Inventories, Checklists, Anecdotal Records, Cumulative Records, Sociometry, Interview Techniques, Achievement and Diagnostic Tests.

Meeting the Individual Differences in the Classroom- General Approaches; Remedial Instruction, Guidance and Counseling, Whole School Approach.

Practicum

Administering Group Tests
Conducting Case Studies
Diagnosing the deviations
Studying School Record and preparing Reports.
Getting Famililiarised with Individual Psychological Tests.

References:

1. Bigge, M.L. (1982). *Learning Theories for Teachers,* (4th edition). New York, Harper and Row Publishers, pp. 89-90.
2. Bolles, R.C. (1975). *Learning Theory*. New York, Holt, Rinehart and Winston, pp. 18-19.
3. Chauhan, S.S. (1978). *Advanced Educational Psychology*, Vikas Publishing House Pvt. Ltd., New Delhi.
4. Dandapani, S. (2001). *A textbook of Advanced Educational Psychology*. New Delhi: Anmol Publications.
5. Dunn, R. (1983). *Can students identify their own Learning Styles?* Educational Leadership, 40, pp. 60-62.
6. Dash, M. (1988). *Educational Psychology*. Delhi: Deep and Deep Publication.
7. Duric, L. (1975). *Performance of Pupils in the Process of Instruction*. Bratislava, SPN, pp. 54-90.
8. Duric, L. (1990). *Educational Sciences: Essentials of Educational Psychology*. International Bureau of Education, UNESCO, New Delhi, Sterling Publishers, p. 81.
9. Fontana, D. (1995). *Psychology for Teachers* (3rd edition). The British Psychological Society, London: McMillan in association with BPS Books.
10. Kumar, S. (2014). Child Development and Pedagogy, Pearson.
11. Kundu C.L. and Tutoo, D.N. (1993). *Educational Psychology,* Sterling Publishers Pvt. Ltd.
12. Lindgren, H.C. (1967). *Educational Psychology in Classroom* (3rd edition). New York: John Wiley and sons.
13. Mohan J. and Vasudeva P.N. (1993). *Learning Theories and Teaching, In Mohan Jitendra (ed.) Educational Psychology*, New Delhi, Wiley Eastern Limited, P. 146.
14. Murthy, CGV and Rao, AVG. (2005). *Life skills Education: Training Package*, Mysore: Regional Institute of Education.

15. NCERT (2013) *Training and Resource materials in Adolescence Education*, New Delhi
16. Oza, D.J. and Ronak, R.P. (2011). *Management of behavioral problems of children with mental retardation*. Germany: VDM publication.
17. Papalia D.E., and Sally, W.O. (1978). *Human Development*. McGraw Hill Publishing Company.
18. Phens, J.M., and Evans, E.D. (1973). *Development and Classroom Learning: An Introduction to Educational Psychology*. New York: Holt Rinehart and Winston Inc.
19. Tessmer, M., and Jonassen, D. (1988). *Learning Strategies: A New Instructional Technology*. In Harris Duncun (1988) Education for the New Technologies, World Year Book of Education. London: Kogan page Inc.
20. Skinner, E.C. (1984). *Educational Psychology*-4th Edition. New Delhi: Prentice Hall of India Pvt. Ltd.
21. Spinthall, N., and Spinthall, R.C. (1990). *Educational Psychology* 5th Edition. McGraw Hill Publishing Company.

Web Resources

- Animated Videos from Study.com, http://study.com/academy/course/educational-psychology-course.html
- Seifert, K. and Sutton, R. 2011). Educational Psychology Third Edition http://www.oercommons.org/courses/educational-psychology/view
- Introduction to Psychology, Open Textbook, http://open.lib.umn.edu/intropsyc/
- Generic Issues, NCERT, http://www.ncert.nic.in/departments/nie/dse/activities/advisory_board/PDF/generic.pdf
- www.aeparc.org

BSE III.6 :Gender, School and Society

Credits: 2 (1L+ 1T +0P) **Marks: 100**
Contact hrs per week: 3 **C1 + C2: 50**
Exam Duration: 2 hrs **C3: 50**

Objectives:
This course enables the student teachers to

- Understand and contextualize ideals of the Constitution of India;
- Appreciate humanistic agenda of the Constitution of India;
- Value and recognize the role of education in realizing the ideals of the Constitution;
- Analyse various educational contexts to see whether the child's rights are ensured
- Understand and develop positive attitudes towards various forms of exclusions;
- Appreciate the measures taken at the national level to universalize elementary and secondary education;
- Analyse the contextual examples to understand the gender issues and concerns;
- Develop positive attitude and values towards promoting gender equality;
- Evolves strategies and mechanisms as a teacher to ensure equality in school and learning contexts

COURSE CONTENT:

Unit I: Education as Fundamental Right

Constitution of India : Fundamental rights; Education as Fundamental right; Human Rights: Meaning, Nature, and classification; Rights of Children: International covenants and Indian Constitution; Education as Fundamental Right of Children: 2009, Rights of girl child

Unit II: Policy framework for public Education in India and its implementation

Education in Post-Independent India: Significant recommendations of commissions and committees, National Policy on Education-1986,Revised 1992, Delors Report: learning the treasure within, Universalization of elementary education: Need and significance; Government schemes and efforts with special focus on Sarva Shiksha Abhiyan, Issues in implementing RTE-2009: A critical understanding. Issues that affect and negate the children's right to education(Child labour: Street children, abandoned and orphans; Differently abled children; Attitude towards the girl child and her participation in schooling; Punishment, abuse and violence in schools). alternative schooling, Secondary education: Universalization of secondary education; universal access, universal enrollment, universal retention, universal success; Issues and Quality concerns- Recommendations of CABE; interventions of RMSA, Initiatives and measures taken at national level to improve teacher education at secondary level: Role of NCTE and NCERT

Unit III: Contemporary Indian Schooling: Concern and Issues

Equality of Educational Opportunity: Meaning and nature; Forms of inequality: Caste, Gender, Transgender, regional, religious and other marginalized groups;

Inequality in Schooling: Public- private schools, Rural-urban schools, Mass-elite schools, single teachers' schools and many other forms of in equal school systems. Positive discrimination: concept and issues and policy intervention;

Understanding Exclusion in schooling: Exclusion: Meaning, and nature; Forms of Exclusion:

Physical/physiological Exclusion; Different kinds/types of differently abled children: Measures to address the issues of leaning of differently abled children and professional preparedness of institutions;

Socio-cultural and economic exclusion

Understanding different forms of socio-cultural and economic exclusion in schooling—Caste, Class, Gender, Minority, and other Marginalized sections of the society;

Critical understanding of 'ascribed identities' on educational opportunities;

Unit IV: Gender: Issues and concerns

Basic Gender concepts: Difference between Gender and Sex; Social construction of Gender; Gender roles as viewed in Indian context; Concept of Transgender

Gender roles in society through various institutions such as family, caste, religion, culture, media and popular culture (films, advertisements, songs etc), law and State; stereotype in gender roles

Issues related to women/girl child: female infanticide and feticide, sex ratio, honour killing, dowry, child marriage, property rights, divorce, widowhood.

Gender bias in school enrolments, household responsibilities, societal attitude towards girl's education

Issues related to gender in school: sexual abuse, sexual harassment, perception of safety at school, home and beyond
Representation of gendered roles, relationships and ideas in textbooks and curricula.
Role of schools, peers, teachers, curriculum and textbooks in challenging gender inequalities or reinforcing gender parity
The Indian constitution and provisions accorded to women; women's rights; legal aspects related to women, indecent representation of women (Prohibition act), cybercrime:
Educational and Employment provisions for Transgender: Legal aspects; social recognition

Sessional activities

- A critical study, with the help of survey and observational study, of alternative schools- child labour schools, night schools, mobile schools and boat schools.
- Critical analysis of different committees and commissions on Education
- Readings on National Policy on Education, RTE Act 2009, Delors Report
- Survey of schools to see the implementation of various incentives of government to equalize educational opportunities
- Textbook analysis for identifying integration of gender issues.
- Prepare presentation on laws related to women harassment, early marriage, property inheritance, trafficking etc.
- Prepare presentations on constitutional provisions and other government measures to promote girl child's education
- Presentation of Case study reports on girl child's problems in schools and at home.

Suggested Readings

- Anand, C.L. et.al. (1983). Teacher and Education in Emerging in Indian Society, NCERT, New Delhi.
- Govt. of India (1986). National Policy on Education, Min. of HRD, New Delhi.
- Govt. of India (1992). Programme of Action (NPE). Min of HRD.
- Mistry, S.P. (1986). Non-formal Education-An Approach to Education for All, Publication, New Delhi.
- Mohanty, J., (1986). School Education in Emerging Society, sterling Publishers.
- Mukherjee, S.N. (1963). Secondary School Administration, Acharya Book Depot, Baroda.
- Mukherji, S.M., (1966). History of Education in India, Acharya Book Depot, Baroda.
- Naik, J.P. & Syed, N., (1974). A Student's History of Education in India, MacMillan, New Delhi.
- NCERT (1986). School Education in India – Present Status and Future Needs, New Delhi.
- Salamatullah, (1979). Education in Social context, NCERT, New Delhi.
- Sykes, Marjorie (1988): The Story of Nai Talim, Naitalim Samiti: Wardha.
- UNESCO; (1997). Learning the Treasure Within.
- Dr. Veda Mitra. Education in Ancient India, Arya book Depot, New Delhi – 1967
- Reports of SSA and RMSA
- NCTE (2009) National curriculum framework for teacher education
- Agarwal, N (2002). Women and Law in India. New Delhi: New century Pub
- Sen,S.(2013). Women's rights and empowerment. New Delhi: Astha Pub.
- Siddiqi, F.E.& Ranganathan,S.(2001). Handbook on women and human rights, New Delhi: Kanishka Pub

Web Resources: Video on improving Gender Equality- EFA Crowdsourcing Challenge, 2012, UNESCO, Pub by The Pearson Foundation, 3 minutes.

BSE III.7 : School Attachment Programme 1

Credits : 2 **Marks: 100**
Duration: 3 Weeks **C1+C2 : 50**
C3 : 50

Objectives

- To familiarize the student teachers to school environment, its structure, functions and processes.
- To familiarize the student teachers with different types of schools existing in the communit**y.**

COURSE CONTENT:

1. The student teachers will visit the neighbourhood schools for one week to get acquainted with the school environment and its functions and processes and submit the report.
2. The student teachers will familiarize themselves with school structure and administration.
3. The student teachers will visit different types of schools such as Government, Government aided and private schools to study their governing norms, regulations and participation in the community.
4. The student teachers will visit the schools run by community/NGO or other organizations like minority run schools, schools in SC/St dominated areas, schools in slum areas, special and inclusive schools and submit the report.

Evaluation:

C1 – Report 1
C2 – Report 2
C3 – Presentation through PPT.

FOURTH SEMESTER

Core Course 1D :Physics

BSE IV.1A :OPTICS

Credits: 4 (3L+ 0T +1P) **Marks: 100**
Contact hrs per week: 5 **C1 + C2: 50**
Exam Duration: 2 hrs **C3: 50**

Objectives:

To enable students to

- understand that light is a wave phenomenon.
- apply the understanding of wave phenomenon to light.

COURSE CONTENT:

Unit I: Nature of Light and Scattering

Brief discussion on theories of light. Dual nature of electromagnetic radiation, electromagnetic spectrum, energy and momentum of em wave. Electromagnetic nature of light. Definition and Properties of wave front. Huygen's Principle.
A brief discussion on Tyndall, Rayleigh and Raman scattering of light. A qualitative account of fluorescence and phosphorescence, the Raman Effect experiment and its explanation, intensity and polarisation of Raman lines, some applications of Raman Effect.

Unit II: Interference

Definition of Coherence, Methods of production of Coherent sources by division of wavefront and division of amplitude. Theory of interference (condition for constructive and destructive interference). Young's double slit experiment, Lloyd's Mirror and Fresnel's Biprism. Interference in Thin Films: parallel and wedge-shaped films. Fringes of equal inclination (Haidinger Fringes); Fringes of equal thickness (Fizeau Fringes). Newton's Rings: measurement of wavelength and refractive index.
Michelson and Fabry-Perot interferometers: determination of wavelength of light. Wavelength difference, Refractive index and Visibility of fringes

Unit III: Diffraction

Fraunhoffer Diffraction, Diffraction at a single slit, double slit, multiple slits, Diffraction grating, Resolving power – Rayleigh's criterion, Resolving power of a grating and telescope.
Fresnel diffraction, half period zone, zone plate, diffraction at a circular aperture and at a straight edge, a slit and a wire using half-period zone analysis.

Unit IV: Polarisation

Polarization by reflection, Brewster's law, Malus law, Double refraction, Production and detection of linearly, circularly and elliptically polarized light, Quarter and half wave plates, Polariods, Discussion on use of Polaroid sheets in preparing tinted sunglasses, Optical activity, Fresnel's theory, Rotatory polarization, use of biquartz.

Reference Books:

1. F A Jenkins and H E White, Fundamentals of Optics, McGraw-Hill, 1976.
2. B.K. Mathur, Principles of Optics, Gopal Printing, 1995.
3. H.R. Gulati and D.R. Khanna, Fundamentals of Optics, R. Chand, 1991.
4. Eugene Hecht,Optics, Pearson Education India, 2012.
5. N. Subramaniam, Brijlal, and M. N. Avadhanulu Textbook of Optics, S. Chand Limited, 2004.
6. A K Ghatak, Optics, Tata McGraw-Hill Education, 2009.
7. Ariel Lipson,Stephen G. Lipson, Henry Lipson, Optical Physics, Cambridge University Press, 2010.

PRACTICALS

Exam Duration : 3 hrs **C3 : 50**

Objectives:

- To provide training in the broad methodology of science through investigatory type and open-ended laboratory exercises.
- To validate the theoretical basis of the experiments.

COURSE CONTENT:

(A minimum of TEN experiments to be selected from the following)

1. To determine the refractive index (n) of a liquid by Liquid Lens.
2. Determination of 'R' of a Lens using the Newton's ring arrangement.
3. Determination of thickness of a paper foil using Air wedge setup.
4. Refractive index (n) of the material of Prism by Spectrometer- measuring angle of minimum deviation.
5. To determine the refractive index (n) of glass & water by apparent depth method.
6. Specific rotation of sugar solution using Polarimeter.
7. Spectrometer- i_1- i_2 curve.
8. Refractive index of glass prism (i-d curve).
9. Spectrometer-solid prism- Dispersive power.
10. Wavelength of sodium D1 & D2 lines using Diffraction grating.
11. Newton's rings-wavelength of sodium light.
12. Cauchy's constants A & B using spectrometer.
13. p– n junction diode characteristics.
14. Half wave Rectifier
15. Construction of full wave, Centre tapped and Bridge rectifiers

References:

1. B.L.Flint & H.T.Worsnop, Advanced Practical Physics for students, Asia Publishing House, 1971.
2. E Armitage, Practical Physics, John Murray.
3. PSSC Physics Laboratory Guide.
4. S.Panigrahi & B.Mallick, Engineering Practical Physics, Cengage Learning India Pvt. Ltd., 2015
5. Indu Prakash and Ramakrishna, A Text Book of Practical Physics, 11th Edition, Kitab Mahal, New Delhi, 2011.
6. Jerry D Wilson and Cecilia A. Hernández-Hall Physics Laboratory Experiments 7th Edition, Cengage Learning, 2009.
7. S.Panigrahi & B.Mallick, Engineering Practical Physics, Cengage Learning India Pvt. Ltd., 2015.
8. Michael Nelson and Jon M. Ogborn, Advanced level Physics Practicals, 4th Edition, reprinted, Heinemann Educational Publishers, 1985.

Core Course 1 D :Botany

BSE IV.1B :PLANT ANATOMY AND ECOLOGY

Credits: 4 (3L+ 0T +1P) **Marks: 100**
Contact hrs per week: 5 **C1 + C2: 50**
Exam Duration: 2 hrs **C3: 50**

Objectives:

- To acquaint students with development, organization and functions of tissues in plants;
- To understand the histological complexity in plants;
- To understand the dynamics of environment and its delicate balance;
- To understand the influence of human beings on quality of environment.

COURSE CONTENT:

Unit I :

a) Meristems – characteristics, classification, theories of meristemetic activity, organization of shoot-apex.
b) Epidermis : Structure and functions, stomatal types, trichomes.
c) Simple tissues : Definition, types – parenchyma, collenchyma, sclerenchyma - structure, functions.

Unit II:

a)Vascular tissues : Structure of xylem and phloem, functions, primary and secondary vascular tissues, types of wood.
b) Review of anatomy of stem, root and leaf of dicot and monocot.
c) Secondary growth in root and stem. Brief account of anomalous secondary growth – Bougainvillea, Dracaena.

Unit III:

a) Ecological Factors : Brief account of edaphic, climatic, physiographic and biotic factors and their ecological importance.
b) Ecosystem : Structure, abiotic and biotic components, bio-energetic approach, food chain, food web, ecological pyramids, bio-geo-chemical cycles of carbon, nitrogen and phosphorus.
c) Community ecology : Community characteristics, frequency, density, cover, life forms.
d) Plant succession : General features, events in succession, brief account of xerarch succession.

Unit IV:

a) Morphological, anatomical and physiological adaptations of plants to environment – hydrophytes, xerophytes, halophytes.
b) Biodiversity : General account, types and characteristics, biodiversity conservation efforts, WCU, Red databook, brief account of Intellectual Property Rights (IPR) and patent laws.
c) Environmental pollution – a brief account of causes, effects and remedies of air, water, soil, radioactive and noise pollution.

References:

1. Esau, K., 1977, Anatomy of Seed Plants, 2nd Ed., John Wiley & Sons, New York.
2. Fahn, A. 1974, Plant Anatomy 2nd Ed., Pergamon Press, Oxford.
3. Mouseth J.D.,1988, Plant Anatomy. The Benjamin/cummings Publishing Co. Inc., California, USA.
4. Singh V., P.C.Pande & D K Jain 2006, Angiosperms, Rastogi Publications, Meerut.
5. Vashishta, P.C. A Text book of Plant Anatomy, Predeep Publications, Jullandar.
6. Gangulee S.C. & Kar.1980, College Botany Vol.I, Central Book Agency, Calcutta.
7. Sharma, P.D., 2006, Environmental biology, Rastogi Publications, Meerut.
8. Mitra, J.N., An Introduction to Systematic Botany and Ecology, World Press, Calcutta.
9. Odum, E.P. 1983, Basic Ecology, Saunders, Philadelphia.
10. Kormondy, E.J. 1996, Concepts of Ecology, Viva Books Pvt. Ltd., New Delhi.
11. Misra, R. 1968, Ecology Work Book, Oxford & IBH, New Delhi.
12. Moore P.W. and S.B.Chapman, 1986, Methods in Plant Ecology, Blackwell Scientific Publications.
13. Krebs, C.J.1989, Ecological Methodology, Harper and Row, New York.

PRACTICALS

Exam Duration : 3 hrs **C3 : 50**

Objectives :

- To develop the skill of free hand sectioning, staining and mounting of plant parts for anatomical study.
- To observe and identify different types of tissues using temporary and permanent slides.
- To perform simple experiments in ecology.

COURSE CONTENT:

1. Study of a common dicot and monocot stem, root and leaf to understand the body plan, tissue systems and modular type of growth.
2. Study of L.S. of shoot tip to understand cyto-histological zonation.
3. Study of epidermal tissue system, stomata and trichome types.
4. Study of density, diversity, frequency of herbaceous species by quadrat method and to compare the frequency distribution with Raunkair's Standard Frequency Diagram.
5. To estimate Importance Value Index on the basis of relative frequency, relative density and relative biomass.
6. To determine moisture content and water holding capacity of soils.
7. To estimate transparency, pH and temperature of different water bodies.
8. To estimate salinity of different water samples.
9. Study of ecological anatomy of hydrophytes, xerophytes, halophytes, epiphytes and parasites.
10. Field study of diversity in leaf shape, size, thickness and surface properties.

Core Course 2 D :Chemistry

BSE IV.2 : THERMODYNAMICS, EQUILIBRIUM AND SOLUTIONS

Credits: 4 (3L+ 0T +1P) **Marks: 100**
Contact hrs per week: 5 **C1 + C2: 50**
Exam Duration: 2 hrs **C3: 50**

Objectives:

- To understand that conservation of energy is the central concept which governs all the changes and to appreciate its role in various thermochemical equations.
- Explain the origin of the driving force of physical and chemical changes and evolution of second law of thermodynamics and related concepts.
- Apply the concept of equilibrium to construct and interpret the phase diagrams.
- To understand the colligative properties of solutions and the behaviour of immiscible liquids.

COURSE CONTENT:

Unit I: Thermodynamics – I

Concept of Energy, Historical perspectives, Generalisation of laws of Thermodynamics based on human experience with Nature and natural Processes. Language of thermodynamics : system, surroundings, etc. Types of system, intensive and extensive properties. State and path functions and their differentials. Thermodynamic process. Concept of heat and work.

First Law of Thermodynamics **:**Statement, definition of internal energy and enthalpy. Heat capacity, heat capacities at constant volume and pressure and their relationship. Joule, Joule–Thomson coefficient and inversion temperature. Calculation of w.q. dU and dT for the expansion of ideal gases under isothermal and adiabatic conditions for reversible process.

Thermochemistry : Standard state, standard enthalpy of formation. Hess's Law of heat summation and its applications. Heat of reaction at constant pressure and at constant volume. Enthalpy of neutralization. Bond dissociation energy and its calculation from thermo-chemical data, temperature dependence of enthalpy, Kirchhoff's equation.

Unit II : Thermodynamics – II

Discussion of experiential knowledge to account for the spontaneity in changes around us.: need for the Second law of thermodynamics , different statements of the law, Carnot cycle and its efficiency, Carnot theorem, Thermodynamic scale of temperature.

Concept of Entropy : Entropy as a state function, entropy as a function of V & T, entropy as a function of P & T, entropy change in physical changes, Clausius inequality, entropy as a criteria of spontaneity and equilibrium. Entropy change in ideal gases and mixing of gases.

Gibbs and Helmholtz functions: Gibbs function (G) and Helmholtz function (A) as thermodynamic quantities. A and G as criteria for thermodynamic equilibrium and spontaneity, their advantage over entropy change. Variation of G and A with P, V and T.

Third law of thermodynamics : Nernst heat theorem, statement and concept of residual entropy, evaluation of absolute entropy from heat capacity data.

Unit III : Chemical Equilibrium and Phase Equilibria

Recognising a system at Chemical Equilibrium. Attributes of Chemical Equilibrium, Thermodynamic derivation of law of mass action, Equilibrium constant and free energy. Factors that affect the chemical equilibrium and Le Chatelier's principle. Calculations involving equilibrium constant Ionic equilibria in aqueous solutions, sparingly soluble salts, solubility product common ion effect, selective precipitation, applications in qualitative analysis.

Ionisation of water, pH scale, weak acids and bases, hydrolysis, buffer solutions, acid base indicators, acid base titrations and multi stage equilibria. Reaction isotherm and reaction isochore.

To establish a systematic way of discussing the changes systems undergo when they are heated and cooled and when their composition is changed. Clapeyron equation and Clausius – Clapeyron equation, applications.

Statement and meaning of the terms–phase, component and degree of freedom, derivation of Gibbs phase rule, phase equilibria of one component system–water, CO_2 and Sulphur systems. Phase equilibria of two component system–solid-liquid equilibria–simple eutectic– Bi–Cd. Pb-Ag Systems, desilverisation of lead. Simple eutectics, systems forming compounds with congruent melting points.

Unit IV: Solutions

To unify the equilibrium properties of simple mixtures on the basis of chemical potential. Solutions of Gases in liquids. Henry's law and its applications, solutions of solids in liquids. Distribution law, application of distribution law to association, dissociation and extraction.

Dilute Solution : Colligative properties, Osmosis, Osmotic pressure, Vant Hoff Theory, Lowering of Vapour Pressure, Depression in Freezing point and Elevation in Boiling Point, Vant Hoff Factor.

Solid solutions – compound formation with congruent melting point (Mg – Zn) and incongruent melting point (NaCl– H_2O), ($FeCl_3$–H_2O) and ($CuSO_4$–H_2O) system. Freezing mixtures, acetone dry ice.

Liquid – liquid mixtures: Ideal liquid mixtures, Raoult's and Henry's law. Non-ideal system – Azeotropes–HC– H_2O and ethanol–water systems.

Partially miscible liquids– Phenol-water, trimethylamine– water, nicotine– water systems. Lower and upper consolute temperature. Effect of impurity on consolute temperature. Immiscible liquids, steam distillation. Nernst distribution law – thermodynamic derivation, applications.

References :

1. Principles of physical chemistry : Puri,Sharma and Pathania, 47th edition
2. Physical Chemistry : Atkins
3. Phase rule: Gurdeep Raj, Goel Publishing house.

PRACTICAL

Exam Duration : 3 hrs **C3 : 50**

Objectives:

- To study the energetics of chemical reactions
- To find out the equilibirium constants of selected systems
- To study the behaviour of immiscible liquid systems
- To appreciate the physical properties of liquids and liquid mixtures

COURSE CONTENT:

1. Determination of heat of neutralization of acids and bases .Verification of Hess's law of constant heat summation.
2. Determination of solubility of sparingly soluble salt at various temperature, calculation of enthalpy of solution.
3. pH titration of acid versus base (observation of change in pH
4. Determination of equilibrium constant of hydrolysis of an ester(ethyl acetate/methyl acetate)
5. Determination of dissociation constant of a weak acid.
6. Determination of solubility product constant (K_{sp}) of a sparingly soluble salt
7. Determination of dissociation constant of phenolphthalein/methyl orange by colorimetric method.
8. Determination of molecular weight of a given liquid by steam distillation.
9. Determination of percentage composition of the given NaCl solution by miscibility temperature method (phenol-water system).
10. Determination of distribution coefficient of benzoic acid between water and toulene or acetic acid between water and 1-butanol.
11. Determination of transition temperature of a given salt hydrate by thermometric method.
12. Determination of molecular weight of a given substance by Rast's method.
13. Determination of density, coefficient of viscosity and surface tension of the given liquid.
14. Determination of refractive index of pure liquids and liquid mixtures.

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References :

Systematic Experiments in Chemistry by Arun Sethi.

Core Course 3D :Mathematics

BSE IV.3A :DIFFERENTIAL EQUATIONS

Credits: 4 (3L+ 1T +0P) **Marks: 100**
Contact hrs per week: 5 **C1 + C2: 50**
Exam Duration: 2 hrs **C3: 50**

Objectives:
By the end of the semester the students will be able to understand the concept of ordinary and partial differential equations, and their uses in solving real life problems.

COURSE CONTENT:

Unit I:
Definition, Formation of a differential equation, Solution of a differential equation, Equations of the first order and first degree, Variables separable, Integrating factors, Homogeneous form – Reducible to homogeneous form, Linear equations, Bernoulli's equation, Exact equations, Equations reducible to exact equations.

Unit II:
Equations of the first order and higher degree, Clairaut's equation solvable for x and y and p, Orthogonal trajectories in polar and Cartesian form, Operator D, Rules for finding the particular integral, Cauchy-Euler differential equation, Legendre's differential equations, Simultaneous differential equations.

Unit III:
Equations which do not contain x, Equation whose one solution is known, Equations which can be solved by changing the independent variable and dependent variable, Variation of parameters, Total differential equation :$Pdx + Qdy + Rdz = 0$, Simultaneous equations of the form $dx/P = dy / Q = dz / R$.

Unit IV:
Formation by elimination of arbitrary constants, Formation by elimination of arbitrary functions, Solution by direct integration, Lagrange's linear equations $Pp + Qq = R$, Standard types of first order non-linear partial differential equations, Charpit's method, Homogeneous linear equations with constant coefficients, Rules for finding the complementary functions, Rules for finding the particular integral, Separation of variables.

References :

1. Higher Engineering Mathematics by Grewal, Wiley Eastern Ltd.
2. An Introduction to Partial Differential Equations by Stephenson, ELBS.
3. A Short Course in Differential Equations by Rainville and Bedient, IBH.
4. Advanced Engineering Mathematics by Kreyszig, Wiley Eastern Ltd.
5. Introductory Course in Differential Equations by Murray, Orient Longman.
6. Differential Equations by Simmons, TMH.
7. Differential Equations by Ayres, Schaum Publishing Company.

8. Ordinary and Partial Differential Equations by Raisinghania, S. Chand and Co.
9. Differential Equations by Vasishta and Sharma, Krishna Prakashan Mandir.
10. A Textbook of Differential Equations by Mittal, Har Anand Publications

Core Course 3D : Zoology

BSE IV.3B :ECOLOGY, BIOGEOGRAPHY AND WILDLIFE

Credits: 4 (3L+ 0T +1P) **Marks: 100**
Contact hrs per week: 5 **C1 + C2: 50**
Exam Duration: 2 hrs **C3: 50**

Objectives:

- To enable students to understand the energy sources, flow of energy and conservation;
- To understand the recycling of minerals and nutrients in ecosystems;
- To understand the dynamics of population;
- To acquaint with the zoogeographic realms of the world;
- To understand wildlife and suggest measure to conserve wildlife

COURSE CONTENT:

Unit I: Environment and Pollution

a) **Environment**– Atmosphere, lithosphere and hydrosphere as habitats and ecological factors
b) **Abiotic factors**: Temperature and light – as ecological factors; limiting factors; Liebig – Blackman's law of limiting factors; Shelford's law of tolerance, Factor – compensation
c) **Biogeochemical cycle** – Phosphorus, nitrogen and sulphur cycles; recycling of organic nutrients
d) **pollution and environmental hazards**–air, water, soil – pollution,causes and remedial measures, replenishment; Global warming and climate change – El Nino, La Nino, Koyota Protocol of Ozone depletion, a brief study of bioremediation

Unit II: Population and Community

a) **Population**: Definition and attributes – density, mortality, natality, vital index, age distribution, growth patterns, migration, dispersal and dispersion; Environmental resistance, carrying capacity of environment
b) **Biotic community**: Definition and structure, Ecotone, edge effects, niche, community stability. Intra and Interspecific interaction – animal associations

Unit III: Habitat Ecology

a) **Ecosystem**– Types, structure, functions and examples; Dynamics of Ecosystem-Ecological pyramids, energy flow in ecosystem (food chain, food web), productivity
b) **Aquatic Ecosystem**: Types and examples. Physico-chemical properties and biotic communities of lake and sea (adaptation of plankton, nekton and neuston)

c) **Terrestrial ecosystem**– Types and physico-chemical properties; biomes – forest, desert and grassland
d) Ecological succession

Unit IV: Biogeography

a) **Biogeography:** Biogeographical realms of the world with emphasis to Indian region. Forest types, flora and fauna, Discontinuous distribution.
b) **Fauna types in India**: Ecological characteristics and important animals of western and southern Ghats.
c) **Wildlife**: Biodiversity and its importance; Red data book; Endemic species, keystone species, Causes of extinction of wildlife; National parks, sanctuaries and bio reserves of India, Hotspots, National and International efforts for conservation of wildlife

References:

1. Fundamentals of Ecology by E.P. Odum – W.B. Saunders, Philadelphia
2. Environmental Studies by S.V.S. Rana – (Rastogi Publications, 2008).
3. Animal Ecology by S.P. Singh, 6th Revised Edition – (Rastogi Publications, 2008).
4. Basic Ecology by E.P Odum (Holt, Rinehart & Winston, New York).
5. Limnology by Welch (McGraw Hill)
6. http://www.iucn.org (for wildlife and Red Data Book)

PRACTICALS

Exam Duration : 3 hrs **C3 : 50**

Objectives:

- To analyse for the physico-chemical and biological factors of water and soil samples;
- To identify and estimate quantitatively the aquatic and terrestrial organisms and their adaptation;
- To observe the population growth pattern;
- To have the skill of conducting experiments for observing animals behaviours.

COURSE CONTENT:

a) Estimation of dissolved oxygen in the pond water.
b) Estimation of dissolved alkalinity in the pond water.
c) Estimation of dissolved salinity in the pond water.
d) Gut content analysis in fish – status in food chain (herbivore, carnivore, omnivore)
e) Qualitative analysis of marine plankton to identify the most common mero- and holo-plankton
f) Identification of the most common Nekton in aquatic environment (marine and fresh water)
g) Population study of ciliates in the culture medium and local insects for growth pattern (logistic and exponential curves)
h) Collection and qualitative and quantitative analysis of soil organisms – Depiction of histogram and pie diagram

i) Animal adaptation in different habits and habitats – a) Fossorial b) Arboreal c) Volent d) Cursorial e) Aquatic
The students will undertake biological study tour to study, identify different specimens and economically important species

The students will visit sanctuary/park/reserve to study wildlife and endangered species and submit report

Skill Enhancement Course - SEC 2 Physics

BSE IV.4A :COMPUTATIONAL PHYSICS

Credits: 3 (2L + 0T +1P) **Marks: 100**
Contact hrs per week: 4 **C1 + C2: 50**
Exam Duration: 2 hrs **C3: 50**

Objectives:

The course aims to emphasize the role of computer programming and numerical analysis in solving problems in Physics.

- To use of computational methods to solve physical problems.
- To use computer language as a tool in solving physics problems (applications).

COURSE CONTENT:

Unit I: Introduction

Importance of computers in Physics, paradigm for solving physics problems for solution. Algorithms and Flowcharts, Algorithm: Definition, properties and development. Flowchart: Concept of flowchart, symbols, guidelines, types. Examples (Cartesian to Spherical Polar Coordinates, Roots of Quadratic Equation, Sum of two matrices, Sum and Product of a finite series, calculation of sin (x) as a series, algorithm for plotting (1) lissajous figures and (2) trajectory of a projectile thrown at an angle with the horizontal).

Unit II: Scientific Programming

Concept of high level language, steps involved in the development of a Program, Compilers and Interpreters. Development of C, Basic elements of C. Character Set, Constants and their types, Variables and their types, Keywords, Variable Declaration and concept of instruction and program. Operators: Arithmetic, Relational, Logical and Assignment Operators. Expressions: Arithmetic, Relational, Logical, Character and Assignment Expressions. Data types, Type declaration of variables, Symbolic constants, Arithmetic operators, Increment and decrement operators, Conditional operator, Bitwise operators, Hierarchy, Arithmetic expressions, Logical operators and expressions, Assignment operators, Arithmetical and assignment statements, Mathematical functions, Input/output statements (unformatted/ formatted), Relational operators, Decision making and branching, Go to, if, if…else, switch

statements, Looping, While, do and for, Arrays (Types of Arrays, DIMENSION Statement, Reading and Writing Arrays), Handling characters and strings, Functions and voids, structures, Pointers (elementary ideas only), File operations(defining and opening, reading, writing, updating and closing of files, Enough examples from physics problems.

Unit III: Scientific word processing

Introduction to LaTeX: TeX/LaTeX word processor, preparing a basic LaTeX file, Document classes, Preparing an input file for LaTeX, Compiling LaTeX File, LaTeX tags for creating different environments, Defining LaTeX commands and environments, Changing the type style, Symbols from other languages. Equation representation: Formulae and equations, Figures and other floating bodies, Lining in columns- Tabbing and tabular environment, Generating table of contents, bibliography and citation, Making an index and glossary, List making environments, Fonts, Picture environment and colors, errors.

Unit IV: Visualization

Introduction to graphical analysis and its limitations. Introduction to Gnuplot. importance of visualization of computational and computational data, basic Gnuplot commands: simple plots, plotting data from a file, saving and exporting, multiple data sets per file, physics with Gnuplot (equations, building functions, user defined variables and functions), Understanding data with Gnuplot.

References:

1) S.S. Sastry, Introduction to Numerical Analysis, 5th Edn., 2012, PHI Learning Pvt. Ltd.
2) V.Rajaraman, Programming in C, PHI Learning Pvt. Ltd., 1994.
3) Yashavant P. Kanetkar, Let Us C, Infinity Science Press, 2008.
4) J.H.Rice, Numerical methods-software and analysis, McGraw Hill, 1983.
5) J.B.Scarborough, Numerical mathematical analysis, Oxford and IBH, 6th edition, 2010.
6) F. B. Hildebrand, Numerical analysis, 2nd edition, Courier Corporation, 2013.
7) Brian P. Flannery, Saul Teukolsky, William H. Press, and William T. Vetterling, Numerical Recipes in C, The art of scientific computing, Cambridge University Press
8) Leslie Lamport, LaTeX– A Document Preparation System, 2nd edition, Addison-Wesley, 1994.
9) Philip K Janert, Gnuplot in action: understanding data with graphs, Manning Publications, 2010.
10) R. C. Verma, et al., Computational Physics: An Introduction, New Age International Publishers, New Delhi, 1999.
11) U.M. Ascher and C. Greif, A first course in Numerical Methods, 2012, PHI Learning.
12) K.E. Atkinson, Elementary Numerical Analysis, , 3rd edition, 2 007, Wiley India.

PRACTICALS

Exam Duration: 3 hrs **C3: 50 Marks**

Objectives:

The course aims to emphasize the role of computer programming and numerical analysis in solving problems in Physics and to provide hands on training on the Problem solving on Computers.

COURSE CONTENT:

(A minimum of TEN experiments to be selected from the following)

1. To print out all natural even/ odd numbers between given limits.
2. To find maximum, minimum and range of a given set of numbers.
3. Calculating Euler number using exp(x) series evaluated at x=1
4. To compile a frequency distribution and evaluate mean, standard deviation etc.
5. To evaluate sum of finite series and the area under a curve.
6. To find the product of two matrices
7. To find a set of prime numbers and Fibonacci series.
8. To write program to open a file and generate data for plotting using Gnuplot.
9. Plotting trajectory of a projectile projected horizontally.
10. Plotting trajectory of a projectile projected making an angle with the horizontally.
11. Creating an input Gnuplot file for plotting a data and saving the output for seeing on the screen. Saving it as an eps file and as a pdf file.
12. To find the roots of a quadratic equation.
13. Motion of a projectile using simulation and plot the output for visualization.
14. Numerical solution of equation of motion of simple harmonic oscillator and plot the outputs for visualization.
15. Motion of particle in a central force field and plot the output for visualization.

References:

1. S.S. Sastry, Introduction to Numerical Analysis, 5th Edn, 2012, PHI Learning Pvt. Ltd.
2. V.Rajaraman, Programming in C, PHI Learning Pvt. Ltd., 1994.
3. Yashavant P. Kanetkar, Let Us C, Infinity Science Press, 2008.
4. J.H.Rice, Numerical methods-software and analysis, McGraw Hill, 1983.
5. J.B.Scarborough, Numerical mathematical analysis, Oxford and IBH, 6th edition, 2010.
6. F. B. Hildebrand, Numerical analysis, 2nd edition, Courier Corporation, 2013.
7. Brian P. Flannery, Saul Teukolsky, William H. Press, and William T. Vetterling, Numerical Recipes in C, The art of scientific computing, Cambridge University Press
8. Leslie Lamport, LaTeX– A Document Preparation System, 2nd edition, Addison-Wesley, 1994.
9. Philip K Janert, Gnuplot in action: understanding data with graphs, Manning Publications, 2010.
10. R. C. Verma, et al., Computational Physics: An Introduction, New Age International Publishers, New Delhi, 1999.

11. U.M. Ascher and C. Greif, A first course in Numerical Methods, 2012, PHI Learning.
12. K.E. Atkinson, Elementary Numerical Analysis, 3rd edition, 2 007, Wiley India.

Skill Enhancement Course - SEC 2 Botany

BSE IV.4B :UTILIZATION OF PLANTS AND HERBAL TECHNOLOGY

Credits: 2(1L+0T+1P) **Max Marks: 100**
Contact Hours per week: 3 **C1+C2 = 50**
Exam duration: 2 hrs. **C3 = 50**

Objectives:
After completion of the course students will be able to:

- Appreciate the wealth and potential of medicinal plants in our country
- Identify important plants that are useful to us
- Familiarise with phytochemical and micropropagation techniques

COURSE CONTENT:
Unit I: Utilization of plants
Brief account (botanical name, family, extraction/ processing where necessary) and uses of the following :

a) Cereals and Pulses : Rice, wheat, maize, millets, pigeon, pea, Bengal gram, green gram, black gram.
b) Fibres : Cotton, jute, linen, coir.
c) Vegetable oils : Groundnut, coconut, sunflower, safflower, castor.
d) Timber and bamboos : Rosewood, teakwood, honne, canes and bamboos.
e) Beverages : General account, coffee, tea, cocoa.
Spices and condiments : General account, cardamom, clove, pepper, ginger, cinnamon, saffron, turmeric, mustard.
f) Rubber : General account, *Hevea, Ficus*.
g) Pharmacognosy:Uses of *Rauwolfia, Phyllanthes, Catharanthus, Ocimum, Tylophora, Zingiber,* Trigonella, and other locally available medicinal plants.

Unit: II
Herbal medicines: history and scope - definition of medical terms - role of medicinal plants in Siddha systems of medicine; cultivation - harvesting - processing - storage - marketing and utilization of medicinal plants.

Unit III:
Phytochemistry - active principles and methods of their testing - identification and utilization of the medicinal herbs; Catharanthus roseus (cardiotonic), Withania somnifera (drugs acting on nervous system), Clerodendron phlomoides (anti-rheumatic) and Centella asiatica (memory booster).

Unit IV:
a) Analytical pharmacognosy: Drug adulteration - types, methods of drug evaluation - Biological testing of herbal drugs - Phytochemical screening tests for secondary metabolites (alkaloids, flavonoids, steroids, triterpenoids, phenolic compounds)
b) Medicinal plant banks micro propagation of important species (Withania somnifera, neem and tulsi- Herbal foods-future of pharmacognosy)

PRACTICAL

Exam Duration : 3 hrs **C3 : 50**

COURSE CONTENT:

1. Identification and study of plants of economic importance included in theory.
2. Methods of cultivation and micropropagation of medicinal plants
3. Familiarisation with basic phytochemical techniques
4. Submission of a report on local medicinal plants
5. Preparation of 2 herbarium sheets of medicinal plants
6. Visit to medicinal plants garden and herbal extraction companies

References:

1. Glossary of Indian medicinal plants, R.N.Chopra, S.L.Nayar and I.C.Chopra, 1956. C.S.I.R, New Delhi.
2. The indigenous drugs of India, Kanny, Lall, Dey and Raj Bahadur, 1984. International Book Distributors.
3. Herbal plants and Drugs Agnes Arber, 1999. Mangal Deep Publications.
4. Ayurvedic drugs and their plant source. V.V. Sivarajan and Balachandran Indra 1994. Oxford IBH publishing Co.
5. Ayurveda and Aromatherapy. Miller, Light and Miller, Bryan, 1998. Banarsidass, Delhi.
6. Principles of Ayurveda, Anne Green, 2000. Thomsons, London.
7. Pharmacognosy, Dr.C.K.Kokate et al. 1999. Nirali Prakashan.

Skill Enhancement Course - SEC2 Chemistry

BSE IV.4C :INORGANIC MATERIALS

Credits : 3 (1L + 0T +1P) **Marks: 100**
Contact hrs per week: 3 **$C_1 + C_2$: 50**
Exam Duration : 2 hrs **C_3 : 50**

Objectives :

- To understand the production, handling and storage of indusrial gases
- To gain knowledge about the manufacture, application and hazardous in handling the inorganic chemicals
- To know the composition, properties and application of silicate minerals in indusry
- To acquire the knowledge of simple fertilizers, surface coatings, alloys, and chemical explosives

COURSE CONTENT

UNIT I : Industrial Gases and Inorganic Chemicals

Industrial Gases: Large scale production, uses, storage and hazards in handling of the following gases: oxygen, nitrogen, argon, neon, helium, hydrogen, acetylene, carbon monoxide, chlorine, fluorine, sulphur dioxide and phosgene.

Inorganic Chemicals: Manufacture, application, analysis and hazards in handling the following chemicals: hydrochloric acid, nitric acid, sulphuric acid, caustic soda, common salt, borax, bleaching powder, sodium thiosulphate, hydrogen peroxide, potash alum, chrome alum, potassium dichromate and potassium permanganate. Industrial Metallurgy - Preparation of metals (ferrous and nonferrous) and ultra pure metals for semiconductor technology.

UNIT II : Silicate Industries

Glass: Glassy state and its properties, classification (silicate and non silicate glasses). Manufacture and processing of glass. Composition and properties of the following types of glasses: Soda lime glass, lead glass, armoured glass, safety glass, borosilicate glass, fluorosilicate, coloured glass, photosensitive glass.

Ceramics: Important clays and feldspar, ceramic, their types and manufacture. High technology ceramics and their applications, super conducting and semi conducting oxides, fullerenes carbon nanotubes and carbon fiber.

Cements : Classification of cement, ingredients and their role, Manufacture of cement and the setting process, quick setting cements.

UNIT III :

Fertilizers: Fertilizers: Different types of fertilizers. Manufacture of the following fertilizers: Urea, Ammonium nitrate, Calcium ammonium nitrate, Ammonium phosphates; Polyphosphate, Super phosphate, Compound and mixed fertilizers Potassium Chloride, Potassium sulphate.

Surface Coatings: Objectives of coatings surfaces, preliminary treatment of surface, classification of surface coatings. Paints and pigments-formulation, composition and related properties. Oil paint, Vehicle, modified oils, Pigments, toners and lakes pigments, Fillers, Thinners, Enamels, emulsifying agents. Special paints (Heat retardant, Fire retardant, Eco-friendly paint, Plastic paint), Dyes, Wax polishing, Water and Oil paints, additives, Metallic coatings (electrolytic and electroless), metal spraying and anodizing

UNIT IV:

Alloys: Classification of alloys, Ferrous and Non-Ferrous alloys, Specific properties of elements in alloys. Manufacture of Steel (removal of silicon decarbonization, Page 39 of 80 demanganization, desulphurization dephosphorisation) and surface treatment (argon treatment, heat treatment, nitriding, carburizing). Composition and properties of different types of steels.

Chemical Explosive: Origin of explosive properties in organic compounds, preparation and explosive properties of lead azide, PETN, cyclonite (RDX). Introduction of rocket propellant.

PRACTICAL

Exam Duration : 3 hrs **C3 : 50**

Objectives:

- To analyse the chemical composition, properties of simple fertilizer and alloys
- To familiarise with the preparation of inorganic salts, dyes and pigments

COURSE CONTENT:

1. Determination of free acidity in ammonium sulphate fertilizer.
2. Estimation of Calcium in Calcium ammonium nitrate fertilizer.
3. Estimation of phosphoric acid in superphosphate fertilizer.
4. Estimation of Cu-Zn in brass
5. Determination of composition of dolomite (by complexometric titration).
6. Analysis of Cu-Ni or (Cu, Zn) in alloy or synthetic samples.
7. Analysis of Cement.
8. Preparation of pigment (zinc oxide).
9. Estimation of Available Oxygen in Hydrogen Peroxide.
10. Determination of phosphoric acid in commercial sample of phosphoric acid.
11. Preparation of chrome alum.
12. Preparation of potash alum from aluminium scarp
13. Preparation of mthyl orange.

References:

1. E. Stocchi: Industrial Chemistry, Vol-I, Ellis Horwood Ltd. UK.
2. R.M. Felder, R.W. Rousseau: Elementary Principles of Chemical Processes, Wiley Publishers, New Delhi.
3. J. A. Kent: Riegel's Handbook of Industrial Chemistry, CBS Publishers, New Delhi.
4. S. S. Dara: A Textbook of Engineering Chemistry, S. Chand & Company Ltd. New Delhi.
5. A. K. De, Environmental Chemistry: New Age International Pvt, Ltd, New Delhi.
6. S. M. Khopkar, Environmental Pollution Analysis: Wiley Eastern Ltd, New

Skill Enhancement Course –SEC 2 : Mathematics

BSE IV.4D :DATA HANDLING

Credits : 2 (2L + 1T + 0P) **Marks: 100**
Contact hrs per week: 4 **C1 + C2: 50**
Exam Duration : 2 hrs **C3 : 50**

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

- understand the types of educational data, procedures of data validation and its analysis.
- appreciate the analysis of educational data by using statistical tests.
- Develop skill of using the application software for data analysis and computation of various statistical measures.
- Compute the different statistical measures by using computerized application software.
- Drawing meaningful conclusions based on the interpretation of analysed data.

Unit I: Data Collection- Nature and types of data
Data collection- primary sources and secondary sources; Scales of measurement (NOIR)
Coding: Variable names; Coding responses; Coding open-ended questions
Tabulation, Constructing frequency distribution table, Graphical representation of data – Pie diagram, Histogram, frequency curve.

Unit II : Descriptive Analysis of Data-1
Measures of dispersion – Range; Quartile deviation; Standard deviation; Coefficient of dispersion; Skewness and Kurtosis.

Unit III: Descriptive Analysis of Data-2
Normal Probability Curve – Meaning, Purpose and Applications, Derived Scores (Z & T Scores).
Measures of Relationships: Meaning of Correlation and Methods of computing correlation - Product Moment Correlation; Rank Difference Method of Correlation

Unit IV: Inferential Statistics
Sampling Procedures –Random sampling, Systematic Random sampling, (with and without repetitions), Stratified random sampling, Cluster sampling, Snow ball sampling.
Hypothesis – Meaning and types; testing of hypothesis – one sample t-test, independent samples t-test, paired samples t-test, Chi-square test.

Practicum:
1. Collect data live – class test scores/ survey data and generate frequency distribution table and represent it graphically.
2. Collect test scores of any school subject of any class and compute Mean, Quartile Deviation and Standard Deviation.
3. Compute coefficient of correlation among language subject papers and core subject papers like – English and History, Mathematics and Science, etc.
4. Study the sampling procedures adopted by taking various school contexts like selecting a team for school reports, team for debate competition, etc.

Skill Enhancement Course SEC 2: Zoology

BSE IV.4E :SERICULTURE

Credits: 3 (1L + 0T + 1P) **Max. Marks: 100**
Contact Hrs per Week: 3 hrs **C1+C2: 50**
Exam. Duration: 2 hrs **C3: 50**

Objectives
- To understand the importance of sericulture
- To provide the hands-on experience in sericulture practices
- To enhance the skill of practicing silk production
- To appreciate the modern technology employed in sericulture practices

COURSE CONTENT:

Unit I: Introduction to Silkworm Practices
Sericulture: Definition, history and present status
Silkworms: Types of silkworms, their food plants and distribution
Non-Mulberry Silkworm: Tasar *(Antherea*: Distribution, life cycle, food plant and marketing
Muga silkworm: Distribution, Food plants and Life cycle, marketing
Eri Silkworm: Distribution, life cycle and food plants, marketing.
Prospectus of Sericulture in India : Sericulture industry in different states, employment
Central Silk Board (CSB): Role of Central Silk Board and Directorate of Sericulture in extension and development.
Moriculture: Salient features and economic importance of the genus *Morus*; Anatomy of mulberry leaf, stem and root
Soil: Physical and chemical properties; Soil nature; Soil moisture; Climatic conditions: Temperature, photoperiod, humidity and rainfall

Unit II: Silkworm Taxonomy And Distribution

Classification and Taxonomic characters: Phylum, class, order, family, genus and species;
Moultinism and voltinism: Univoltine, bivoltine and multivoltine races; Distribution and Races; Geographical distribution in the world and India;
Life cycle: Egg, larvae, pupa and adult, life span

Unit III: Silkworm Morphology

Egg: External and internal morphology and colour change;
Larvae: Mouth parts, legs, prolegs, spiracles, eyes, claspers and integumentary hair and sexual markings;
Pupa: Male and Female Morphology and sexual dimorphism;
Adult: Mouth parts, antenna, wings, external genitalia.
Silk glands: Structure, development and mechanism of silk synthesis
Endocrine glands: Endocrine glands in lava and pupa; Hormonal control on metamorphosis, diapause, silk synthesis. Pheromone: sex attractants and their role in mating.

Unit IV: Silkworm Rearing Technology and Diseases

Rearing: Rearing appliances, Rearing trays, ant-wells, rearing stands and racks, paraffin papers, rubber foam pads, net, chopsticks and feathers; Mountages
Disinfectants appliances: Disinfect ants - Formalin, bleaching powder, RKO, Disinfectant appliances: Sprayers and dusters
Seed: Collection of disease-free layings (DFLs), cards, loose eggs, incubation; Hatching and Brushing: Uniform hatching and Brushing methods for I instar larvae
Basic concepts of silkworm diseases: Viral and Protozoan diseases (Nuclear polyhydrosis virus (NPV); *Nosema bombycis* (Pebrine disease) and Preventive measures
Bacterial diseases: Bacterial septicemia (*Bacillus sp*.); Fungal Diseases (white muscardine (*Beauveria bassiana*),
Silkworm pests—Tachinid Fly (Uzifly), Dermistid beetles; Vertebrate and other silkworm pests and their control.

References

1. Narasingabba, M. N. (1988) Manual of silkworm and its production by Central Silk Board, Bangalore.
2. Tasar culture. Dr. M. S. Jolly et. al., CSB, 1974.
3. Silkworm Rearing Techniques in the Tropics, Dr. S. Omura, Japan International Cooperation Agency, 1980.
4. Muga Silk Industry by S. N. Choudhary, Directorate of Sericulture and weaving, Govt. of Assam, 1982.
5. Studies on soils of India, S. V. Govind Rajan and H. G. Gopala Rao (1970), Vikas Publ. House Pvt. Ltd., New Delhi.
6. Boraiah, G. (1986) Mulberry Cultivation. Lectures on Sericulture.
7. Manual on Sericulture; Food and Agriculture Organisation Rome 1976.
8. Appropriate Sericultural Techniques Ed, by M. S. Jolly Director, CSR & TI, Mysore.
9. Handbook of Silkworm Rearing: Agriculture and Technical Manual-1, Fuzi Pub. Co. Ltd., Tokyo, Japan1972.
10. A Guide for Bivoltine Sericulture: K. Sengupta, Director, CSR & TI, Mysore 1989.

PRACTICAL

Exam Duration : 3 hrs **C3 : 50**

Objectives

- To provide the hands-on experience in sericulture practices
- To enhance the skill of practicing silk production
- To appreciate the modern technology employed in sericulture

COURSE CONTENT:

1. Preparation of a map showing extension of sericulture in the world.
2. Preparation of a map showing extension of sericulture in India.
3. Graphical representation of cocoon and silk production by various silkworms in India.
4. Moriculture: a) Soil sampling and analysis of pH and moisture content. b) External morphology of root, stem and leaf. c) Methods of propagation by cutting.
5. Morphology – Egg, last instar larva, pupa, adult, sexual dimorphism, mouthparts, antennae, legs, prolegs, wings.
6. Anatomy – Dissection of silk gland of larva and adult.
7. Study of appliances—Types of trays and racks, types of mountage, Cellule, humidity and temperature devices, dusters and sprayers.
8. Life cycle of Silkworm
9. Silk products—Silk wastes, spun yarn and other byproducts.
10. Single cocoon reeling—determination of average filament length and denier
11. Visit to various sericulture department/centres.
12. Collection of mulberry disease sample and preservation.
13. Study of mulberry fungi, viruses and bacteria causing diseases.

PROFESSIONAL EDUCATION COURSES

BSE IV.5: LEARNING AND TEACHING

Credits: 4 (3L+ 1T +0P) **Marks: 100**
Contact hrs per week: 5 **C1 + C2: 50**
Exam Duration: 2 hrs **C3: 50**

Objectives:

The student teacher will be able to:

- Gain the knowledge about the scientific knowledge about the process of learning.
- Understands the Conditions Essential for Facilitating Learning and Retention.
- Apply the Principles and Strategies of Major Approaches to Learning in Classroom Environment.
- Understands the Process of Effective Teaching and Qualities of Effective Teachers.
- Understands various Approaches to Teaching and will be able to apply them in the relevant situations.
- Understands the Principles and Strategies for Creating Conducive Classroom Environment.
- Appreciates the role of a teacher as leader, organizer, a facilitator & a humane reflective practitioner.
- Realize the difficulties in learning and teaching.

COURSE CONTENT

Unit I : Concept and Nature of Learning

Factors Associated with Learning
Maxims of Learning and their Educational Implications
Approaches to Learning(Concept, Associated Concepts Basic Principles and Educational Implications)-Habitual Learning, Associative Learning (Classical and Instrumental Conditioning), Spatial Learning/Cognitive Maps, observational Learning, Learning by Insight, Information Processing Approach, Humanistic Approach, Constructivist Learning Approach
Types of Learning-Concept Learning, Skill Learning, Verbal Learning, Learning of Principles and Problem Solving(Meaning, Nature, Stages, Principles and Approaches/Strategies)

Unit II

Attention-Meaning, Factors Influencing Attention, Strategies for Enhancing Attention;
Perception-Meaning, Laws of Perceptual Organization (Gestalt Psychologists' View) and Educational Implications.
Process of Memory- Sensory Registration, Retention(Storing), Recognition, Recall;

Factors Influencing Retention; Strategies for Enhancing Memory.

Transfer of Learning- Concept, Types, Theories; Strategies for Enhancing Positive Transfer of Learning
Achievement Motivation- Concept, Intrinsic and Extrinsic Motivation; Strategies for enhancing Achievement Motivation in Students.

Unit III: Understanding the process of Teaching-Learning

Teaching as a Profession
Teaching as an Art and Science.
Understanding the Process of Teaching as a Profession
Identifying the need and importance of classroom teaching-learning
Reflective teaching
skillful teaching
Applying the knowledge of Maxims of Teaching
Role of teacher in identifying classroom related problems

Unit IV: Teacher and Teaching as a profession

Various Approaches to Teaching: Behaviourist, Cognitivist, Constructivist, Connectionist, Participatory, Cooperative, Collaborative, Personalized, and Holistic

Teacher as a Facilitator and Guide/Philosopher/Friend

Teachers commitment towards fulfilling Felt Need of Learners

Professional Characteristics of Teacher in Classroom Management.
Skills & Competencies of a Teacher Communication: Meaning,mode::input/process/output
Basic Model of Communication: Sender, Message, Medium, Receiver & Reach;Factors facilitating communication
Effective Classroom Management-Principles and Strategies
Leadership Qualities in Teachers

Practicum

Conducts Projects on –

Identifying the Learning Difficulties of Students in Different School Subjects and the Possible Reason for them;

Providing Remedial Instruction to the Students with Learning Difficulties;

Study the Qualities of Effective Teachers through observation, interview, case study etc.,

Visiting Model Schools and Prepare Reports

References:

- Benjamin S., Bloom et al. (1964). *Taxonomy of educational objectives*. Longman Group.
- Bruce Joyce (1985) *Models of teaching* (2nd ed.) Prentice Hall**.**
- Encyclopaedia of Modern Methods of Teaching and Learning (Vol. 1-5).
- Gage N.L. Scientific Basis of art of Teaching
- Gavriel Salomon (1981) *Communication and education* Sage.
- Lieberman, M. (1956) *Education as a profession*. Prentice Hall, Inc.
- Karthikeyan, C. (2004). *A Text book on instructional technology*, RBSA.

- Kumar, S. (2014). Child Development and Pedagogy, Pearson.
- Ohles, J.F. (1970). *Introduction to Teaching*. New York: Random House, INC.
- Siddiqui, Mujibul Hasan (2005). *Techniques of classroom teaching* A.P.H
- Skinner, E.C.(1984). *Educational Psychology. 4th Edition.* New Delhi: Prentice Hall of India Pvt. Ltd.
- Snowman & Baihler (2006). *Psychology Applied to teaching*. Boston: Houghton Mifflin Company.
- Stephens, L.M. & Evans, E.D. (1973). *Development and Classroom Learning: An Introduction to Educational psychology*. New York: Holt, Rinehart and Winston, Inc.
- Tanner, L.N. & Lindgren, H.C. (1971). *Classroom Teaching and Learning*. New York: Holt, Rinehart and Winston, Inc.

Web Resources

- Courses on Communication Skills, http://nptel.ac.in/courses/109104030/
- Jane Ciumwari Gatumu, Reflective Teaching, http://oer.avu.org/bitstream/handle/123456789/155/REFLECTIVE-TEACHING.pdf?sequence=1
- School leadership (2011), http://azimpremjifoundation.org/pdf/learning-curve-16.pdf

BSE IV.6 :DRAMA AND ART EDUCATION

Credits: 4 (3L+ 1T +0P) **Marks: 100**
Contact hrs per week: 5 **C1 + C2: 50**
Exam Duration: 2 hrs **C3: 50**

Objectives :

The student teacher will be able to:

- Understand the use of 'Drama' as a Pedagogy.
- Use 'Role play' technique in the teaching learning process.
- Understand the importance of dramatic way of presentation.
- Integrate singing method in teaching learning process.
- Understand various 'Dance forms' and their integration in educational practices.
- Use art of drawing and painting in teaching learning process.
- Develop creativity through different creative art forms.
- Understand the efficacy of different art forms in education.

COURSE CONTENT

Unit I : Drama and its Fundamentals

Creative writing – Drama writing, Drama as a tool of learning, Different Forms of Drama Role play and Simulation, Use of Drama for Educational and social change (Street play, Dramatization of a lesson), Use of Drama Techniques in the Classroom: voice and speech, mime and movements, improvisation, skills of observation, imitation and presentation

Unit II: Music (Vocal & Instrumental)

Sur, Taal and Laya (Sargam), Vocal - Folk songs, Poems, Prayers, Singing along with "*Karaoke*", Composition of Songs, Poems, Prayers, Integration of *Vocal & Instrumental* in Educational practices

Unit III: The Art of Dance

Various Dance Forms - Bharat Natyam, Kathakali, Kuchipudi, Yakshagana- Folk dance and various other dances
Integration of Dance in educational practices
(Action songs, *Nritya Natika*)

Unit IV: Drawing and Painting

Colours, Strokes and Sketching- understanding of various means and perspectives, Different forms of painting- Worli art, Madhubani art, Glass painting, Fabric painting and various forms of painting, Use of Drawing and Painting in Education -Chart making, Poster making, match-stick drawing and other forms, Model making – Clay modeling, Origami, Puppet making, Decorative – Rangoli, Ekebana, Wall painting (Mural), Kalameshuthu or any other local art

Transactional Strategies

Lecture cum Discussion for each Unit (Unit 1 to 4) followed by simulated/ authentic practices, Workshop schedule, Slide / Film show, Project work, Demonstration, Simulation, Group work and field trips involving meetings with folk singers and other skilled practitioners will especially form part of the transaction scheme. In addition to the above any one or more of the following:

Practicum

Suggestive List:

1. Developing a script of any lesson in any subject of your choice to perform a Play / Drama.
2. Developing a script for the street play focusing on "Girl's education and Women empowerment".
3. Preparing a pictorial monograph on "Various folk dance of South India.
4. Preparing a pictorial monograph on "Various Classical Dance forms in India".
5. Preparing a calendar chart on "Various Musical Instruments in India".
6. Develop an Audio CD based on newly composed Poems of any Indian language.
7. Preparing some useful, productive and decorative models out of the waste materials.
8. Visit the Faculty of Performing Arts in your city and prepare a detailed report on its multifarious functioning.
9. Development a Review of a theatre programme if possible
10. Organize a competition on some Decorative / Performing Art forms in the school during your School Internship programme and prepare a report on it.
11. Organizing a workshop on some selected Creative Art forms in the school during your School Internship programme and prepare a report on it.

*** In addition, school and community based activities may be organized with provisions for visits to innovative centres of pedagogy and learning, innovative schools, educational**

resource centres, etc.Action research based on teaching learning and school and community could be conducted.

Evaluation Strategies

Sessional, practicum, unit test project work related presentations.

Suggested Readings

1. Natyashastra by Bharathamuni
2. Deva, B.C. (1981). An Introduction to Indian Music. Publication Division, Ministry of Information and Broadcasting, Government of India.
3. NCERT (2006). Position Paper by National Focus Group on Arts, Music, Dance and Theatre
4. Theory of Drama by A. Nicoll

Web Resources

Position Paper National Focus Group on Arts, Music & Dance, NCERT
http://www.ncert.nic.in/new_ncert/ncert/rightside/links/pdf/focus_group/art_education.pdf
Arts in school education, (2012), http://azimpremjifoundation.org/pdf/LCXVIII.pdf
Online courses on Arts, http://www.dsource.in/course/index.php
Learning Indicators and Learning Outcomes at the Elementary Stage, (2014), NCERT
http://www.ncert.nic.in/departments/nie/dee/publication/pdf/LI_Final_Copy_Revised_29.12.14.pdf

BSE IV.7 : School Attachment Programme 2

Credits : 2 **Marks: 100**
Duration : 3 weeks **C1 + C2:50**
C3: 50

Objectives:

- To familiarize student teachers with classroom processes and skills employed in teaching-learning process
- To provide field experience of assessment practices including record maintenance and report cards followed in schools at elementary and secondary levels.

COURSE CONTENT:

1. The student teachers will observe minimum 3 classes of regular teachers for understanding the skills and strategies used in teaching by them.
2. The student teachers will take two classes in each pedagogy by integrating various skills of teaching.
3. The student teachers will observe the integrated skills of teaching given by their peers and submit the observation records. (minimum 3 classes in each pedagogy).
4. The student teachers will visit schools and interact with teachers to know about the assessment practices like CCE, grading patterns and reporting the performance of students and submit the report
5. Students will analyse the assessment records and the report cards to study the models of assessment and procedures followed in reporting students' performance. The students will attend the PTA meetings where feedback about students' performance is given by the teachers and submit the report.

Community Based Activities:

Objectives

- To develop an awareness and understanding of educational status of the community.
- To create an awareness of the implementation of various programmes of the government related to school education through field experiences and community participation.

Activities

- The student teachers will visit the local community to study the drop out/ out of school children and the modes of alternative education received by them.
- Organize awareness programmes in the selected community on literacy, human rights, gender sensitization, environmental conservation etc through street play, role play and dramatization.
- To interact with community members like zilla parishat members, SDM and PTA members to study about their participation in school development programmes

Evaluation:

C1 – Report 1
C2 – Report 2
C3 – PPT presentation of community based activities

FIFTH SEMESTER

Core Course 1 E : Physics

BSE V.1A :ATOMIC AND MOLECULAR PHYSICS

Credits: 4 (3L+ 0T +1P) **Marks: 100**
Contact hrs per week: 5 **C1 + C2: 50**
Exam Duration: 2 hrs **C3: 50**

Objectives:

To enable students to apply the basic knowledge of classical and quantum mechanics at the atomic and molecular level.

COURSE CONTENT:

Unit I: Atomic Physics-I

The Electron: Determination of e/m of an electron by Thomson method, Determination of charge of an electron by Millikan's oil drop method.
Atomic Spectra: Inadequacy of Bohr atomic model, correction due to finite mass of the nucleus, Rydberg constant in terms of reduced mass, Excitation and Ionization potentials, Franck-Hertz experiment, Bohr-Sommerfeld Model of atom, relativistic mass correction, vector model of an atom, Electron spin, space quantisation, magnetic moment of an electron due to its orbital motion. Stern-Gerlach experiment and its theory.

Unit II: Atomic Physics-II

Spin-orbit interaction and Fine structure of spectral lines. Quantum numbers and selection rules. Pauli's exclusion principle. Electronic configuration of atoms. Valence electron and a brief mention of L-S and J-J coupling for multi electron atoms. Fine structure lines of Sodium Zeeman effect. Explanation of Zeeman effect on the basis of vector model of atom, Expression for Zeeman shift and experimental details. Mention on anomalous Zeeman effect, A qualitative mention of Paschen – Back and Stark effects.

Unit III : Molecular Spectra

Molecular formation, the H_2^+ molecular ion, H_2 – molecule. Salient features of molecular spectra. Rotation, vibration and electronic spectra of molecules, associated quantum numbers and selection rules. Theory of pure rotation and rotation- vibration spectra, Raman and Infrared (IR) spectra, simple applications. UV-Visible, Fourier Transform IR, Nuclear Magnetic resonance (NMR) and Laser Raman spectra of organic molecules and their interpretations.

Unit IV: X-Rays

Electromagnetic spectrum, production of X-rays, X-ray spectra, Continuous X-ray spectra Characteristic X-ray. Duanne and Hunt limit. Moseley's law and its significance, X-ray energy levels. Bragg's law and Bragg spectrometer. A brief mention of different types of crystals. Structures of NaCl and KCl crystals. Compton Effect, Expression for Compton Shift.X-ray diagnostics and imaging

Reference Books:

1. H. S. Mani and G. K. Mehta, Introduction to Modern Physics, Affiliated East-West Press, India, 1990.
2. Arthur Beiser, Perspectives of Modern Physics, McGraw-Hill Inc.,US; International edition edition.
3. J.R. Taylor, C.D. Zafiratos, Modern Physics, M.A. Dubson, PHI Learning, 2009.
4. R.A. Serway, C.J. Moses, and C.A.Moyer, Modern Physics, Cengage Learning, 2005.
5. G. Kaur and G.R. Pickrell, Modern Physics, McGraw Hill, 2014.
6. Rich Meyer, Kennard, Coop, Introduction to Modern Physics, Tata McGraw Hill, 2002.
7. R. Murugeshan and K. Sivaprasath Modern Physics, S. Chand Publisher, 1994.
8. J. R. Reitz, F. J. Milford, and R. W. Christy, Foundations of Electromagnetic Theory, Addison-Wesley; 4 edition, 2008.
9. Banwell and E. Mccash, Fundamentals for Molecular Spectroscopy, McGraw Hill Education; 4 edition, 1994.
10. H. E. White, Atomic Spectra –, McGraw-Hill, 1954.

PRACTICALS

Exam Duration: 3 hrs **C3: 50 Marks**

Objectives:

- To provide training in the broad methodology of science through investigatory type and open-ended laboratory exercises.
- To validate the theoretical basis of the experiments.

COURSE CONTENT:

(A minimum of TEN experiments to be selected from the following)

1. Franck-Hertz experiment.
2. Study of sodium lines using discharge tubes.
3. Study of hydrogen lines using discharge tubes.
4. Study of helium lines using discharge tubes.
5. Dissociation energy of Iodine.
6. Hartmann's formula for wavelength.
7. Benzene IR spectrum.
8. Rydberg Constant – Solar Spectrum

9. Excitation of Brass spectrum using Arc method
10. Rutherford model – Simulation technique.
11. Zener diode characteristics.
12. Transistor characteristics and transfer characteristics in Common Base configuration-current gain.
13. Transistor characteristics and transfer characteristics in Common Emitter configuration-current gain.
14. CE Transistor Amplifier-Frequency response.
15. Basic operational amplifier.
16. Energy gap of a semiconductor.
17. Bi-prism experiment.
18. Resolving power of grating.
19. Current balance experiment- the effects of a magnetic field on a current carrying conductor.
20. Resolving power of a telescope.

References:

1. B.L.Flint & H.T.Worsnop, Advanced Practical Physics for students, Asia Publishing House, 1971.
2. E Armitage, Practical Physics, John Murray.
3. PSSC Physics Laboratory Guide.
4. S.Panigrahi & B.Mallick, Engineering Practical Physics, Cengage Learning India Pvt. Ltd., 2015
5. Indu Prakash and Ramakrishna, A Text Book of Practical Physics, 11th Edition, Kitab Mahal, New Delhi, 2011.
6. Jerry D Wilson and Cecilia A. Hernández-Hall Physics Laboratory Experiments7th Edition, Cengage Learning, 2009.
7. S.Panigrahi & B.Mallick, Engineering Practical Physics, Cengage Learning India Pvt. Ltd., 2015.
8. Michael Nelson and Jon M. Ogborn, Advanced level Physics Practicals, 4th Edition, reprinted, Heinemann Educational Publishers, 1985.

Core Course 1 E :Botany

BSE V.1B : BOTANICAL NOMENCLATURE, ANGIOSPERM TAXONOMY AND UTILIZATION OF PLANTS

Credits: 4 (3L+ 0T +1P) **Marks: 100**
Contact hrs per week: 5 **C1 + C2: 50**
Exam Duration: 2 hrs **C3: 50**

Objectives:
• To understand the principles of plant nomenclature;
• To appreciate the evolution of taxonomic thought and the various systems of classification;
• To understand the diversity that exists among angiosperms;
• To make detailed study of selected families;

• To appreciate the utility of plants and plant products in human welfare.

COURSE CONTENT

Unit I :

ICBN, principles and aims; type concept, concept of genus and specific epithet, Principle of priority, units of classification.

Brief account of regional, national and international herbaria, significance of herbaria; identification keys and floras.

Brief history, development of taxonomic thought, outlines of artificial, natural and phylogenetic systems of classification.

Salient features and outline classification of Bentham and Hooker and Cronquist.

Unit II :

Study of the diagnostic features, salient vegetative and floral characteristics and economically important plants of following families : i)Magnoliaceae ii)Capparidaceae, iii)Malvaceae, iv) Fabaceae, v)Rutaceae, vi)Apiaceae, vii)Euphorbiaceae, viii)Amarantaceae

Unit III :

Study of the diagnostic features, salient vegetative and floral characteristics and economically important plants of following families : i) Apocyanaceae ii)Asclepiadaceae, iii)Acanthaceae, iv)Solanaceae, v) Lamiaceae, vi)Liliaceae, v)Poaceaex, vi)Arecaceae

Unit IV:

Brief account (botanical name, family, extraction/ processing where necessary) and uses of the following :

a) Cereals and Pulses : Rice, wheat, maize, millets, pigeon, pea, Bengal gram, green gram, black gram.
b) Fibres : Cotton, jute, linen, coir.
c) Vegetable oils : Groundnut, coconut, sunflower, safflower, castor.
e) Timber and bamboos : Rosewood, teakwood, honne, canes and bamboos.
f) Beverages : General account, coffee, tea, cocoa.
g) Spices and condiments : General account, cardamom, clove, pepper, ginger, cinnamon, saffron, turmeric, mustard.
h) Rubber : General account, Hevea, Ficus.
i) Medicinal plants : Brief account of ethnobotany, uses of Cinchona, Rauwolfia, Phyllanthes, Catharanthus, Ocimum, Tylophora and other locally available medicinal plants.

References:

1. Jones, A.B. and A.Luchsinger, 1979, Plant Systematics, McGrow Hill Book Co., New York.
2. Priti Shukla and Misra, 1988, Taxonomy of Angiosperms, Vikas Publishing House, New Delhi.
3. Hutchinson, J., The families of Flowering Plants, Clarendon Pres, Oxford.
4. Davis, P.H. and V.H.Heywood, 1963, Principles of Angiosperm Taxonomy, Oliver and Boyd, London.
5. Heywood, V.H. and D.M.Moore (Ed.)1984, Current concepts in Plant Taxonomy, Academic Press, London.
6. Singh, G.1999, Plant Systematics : Theory and Practice, Oxford and IBH Pvt. Ltd., New Delhi.

7. Stace, C.A. 1989, Plant Taxonomy and Biosystematics (2nd Ed.), Edward Arnold, London.
8. Singh V. and D.K.Jain, 2005, Taxonomy of Angiosperms, Rastogi Publications, Meerut.
9. Kochhar S.L.1981, Economic Botany in the Tropics, MacMillan India Litd., Delhi.
10. Vashista P.C. 1980, Taxonomy of Angiosperms, Sultanchand & Co., New Delhi.
11. Lawrence, G.H.M. 1950 Taxonomy of Vascular Plants, MacMillan, London.

PRACTICALS

Exam Duration : 3 hrs **C3 : 50**

Objectives:
- To acquaint students with the technical terms and identification keys for describing and identifying angiosperms.
- To familiarize with local plants belonging to families included in the study.
- To be able to describe the vegetative and floral characteristics, draw floral diagram and write floral formulae of angiosperms.
- To familiarize with common plants/plant products of economic importance.
- To develop the skill of undertaking field study and preparing herbarium sheets.

COURSE CONTENT :
1. Study of selected technical terms and their definitions (used in the description of plant).
2. Detailed study of at least one plant specimen per family as given in theory syllabus.
3. Field study (3-5 days) to a nearby forest, for collection, identification and submission of 5 herbarium sheets;
4. To recognize the botanical name, family, part used and products of economic importance as per theory syllabus;
5. Preparation and submission of an illustrated inventory of 5 medicinal plants used in indigenous systems of medicine and allopathy (Write their botanical name, family, part used, active principle and diseases/disorders for which they are prescribed).

Core Course 2EChemistry

BSE V.2 :TRANSITION ELEMENTS, COORDINATION COMPOUNDS AND CHEMICAL KINETICS

Credits: 4 (3L+ 0T +1P) **Marks: 100**
Contact hrs per week: 5 **C1 + C2: 50**
Exam Duration: 2 hrs **C3: 50**

Objectives:
- To develop an understanding of Principles of Chemical Kinetics and Surface Chemistry.
- To explain the properties of d and f block elements and their compounds in terms of their electronicconfiguration and bonding.
- To understand the properties of coordination compounds in terms of bonding theories.

COURSE CONTENT:

Unit I: d-block and f-block elements

To relate the electronic configuration to the properties and structure of transition metals and their compounds. Characteristic properties of d-block elements.

Properties of the elements of the first transition series, their binary compounds and complexes illustrating relative stability of their oxidation states, coordination number and geometry.

Chemistry of Elements of Second and Third Transition Series

General characteristics, comparative treatment with their 3d-analogues in respect of ionic radii, oxidation states, magnetic behaviour, spectral properties and stereochemistry. Powder metallurgy – extraction of tungsten. Position of lanthanides and actinides in the periodic table, lanthanide contraction and its consequences, spectral and magnetic properties of lanthanides, separation of lanthanides and actinides. General properties of actinides:

Extraction of Thorium, Uranium and Plutonium from burnt nuclear fuels.

Unit II : **Coordination Compounds**

To apply theories that explain certain properties and structure of transition metal complexes. Werner's coordination theory and its experimental verification, nomenclature of coordination compounds, isomerism in coordination compounds, valence bond theory of transition metal complexes. Limitations of VBT. Elementary treatment of crystal field theory, splitting of d-orbitals in square planar, tetrahedral and octahedral complexes, factors affecting crystal field parameters, Explanation of magnetic behavior and color of complexes using CFT, effective atomic number concept. Metal carbonyl, 18 electron rule, Preparation, structure and reactions of $Ni(CO)_4$, $Fe(CO)_5$ and $V(CO)_6$, nature of bonding in metal carbonyls.

Unit III: Chemical Kinetics

Understanding the factors that influence a chemical reaction and rationalising them on the basis of known theories of reaction rates. Chemical kinetics and its scope, rate of a reaction, factors influencing the rate of a reaction – concentration, temperature, pressure, solvent, light, catalyst. Concentration dependence of rates, mathematical characteristics of simple chemical reactions – zero order, first order, second order, pseudo order, half life and mean life. Determination of the order of reaction – differential method, method of integration, method of half-life period and isolation method. Radioactive decay as a first order phenomenon.

Effect of temperature on rate of reaction, Arrhenius equation, concept of activation energy, Simple collision theory based on hard sphere model, transition state theory (equilibrium hypothesis). Expression for the rate constant based on equilibrium constant and thermodynamic aspects.

Unit IV :Surface Phenomena

Adsorption: Introduction-Absorption and adsorption(definition, examples and differences) types of adsorptions-physical and chemical(definition, examples and differences between them), factors influencing the adsorption of gases on solids. Adsorption isotherms: definition, Mathematical expression for Freundlich and Langmuir's adsorption isotherms. applications of adsorptions.

Catalysis: Definition, general characteristics, action of catalytic promoters and inhibitors. Homogeneous catalysis (definition and examples),Heterogeneous catalysis(definition and examples) mechanism of heterogeneous catalysis(based on adsorption theory) enzyme catalysis (definition and examples) Mechanism of enzyme catalysed reaction(lock and key mechanism)

References :

1. Inorganic Chemistry : James Huhey
2. Essentials of physical chemistry Arun Bahl,B.S. Bahl,G.D. Tuli
3. Concise Inorganic Chemistry J.D.Lee 5th edition,Wiley publishers.
4. Advanced Inorganic Chemistry Satya Prakash G.D. Tuli S.K. Basu, R.D. Madan S.Chand and company pvt. Ltd.
5. Principles of Physical Chemistry Puri,Sharma and Pathania.

PRACTICAL

Exam Duration : 3 hrs **C3 : 50**

Objectives:

- To understand the kinetics of chemical reactions
- To familiarise with the analysis of ores
- To prepare and analyse inorganic complexes
- To study the adsorption phenomena

COURSE CONTENT:

1. Iodination of Acetone by titration and Colorimetry.
2. Acid Hydrolysis of Ester
3. Reaction between Potassium Peroxydisulphate and Potassium Iodide.
4. Base Hydrolysis of an Ester by Titration and Conductometry
5. Iodine clock reaction
6. Solvolysis of Tertiary Butyl Chloride by Titrimetry, conductometry and pH metry
7. Inversion of Cane Sugar
8. Colorimetric study of kinetics of oxidation of Indigo carmine by Chloromine-T.
9. To study the adsorption of acetic acid on activated charcoal
10. To determine the relative strength of Hydrochloric acid and sulphuric acid by studying the kinetics of hydrolysis of ethyl acetate.
11. To study kinetically the reaction rate of decomposition of iodine by hydrogen peroxide.
12. Determination of Copper by colorimetric method using ammonia as the complexing agent.
13. Determination of Ferric ion by colorimetric method using potassium thiocyanate as the complexing agent.
14. Estimation of Manganese in pyrolusite by volumetric method
15. Preparation of a complex: potassium trioxalato aluminate(III) trihydrate or potassium trioxalato cobaltate(III)
16. To determine the rate constant for the inversion of sucrose using polarimeter.

References :

1. Advanced practical inorganic chemistry by Gurdeep Raj, Goel Publication House, Meerut-India.
2. Systematic Experiments in chemistry by Arun Sethi, New age International Pvt.Ltd, New Delhi.

Core Course 3E : Mathematics

BSE V.3A :MULTIVARIATE CALCULUS & VECTOR CALCULUS

Credits: 4 (3L+ 1T +0P) **Marks: 100**
Contact hrs per week: 5 **C1 + C2: 50**
Exam Duration: 2 hrs **C3: 50**

Objectives:
To enable the students to understand the concepts of multi-variate calculus and vector calculus, and also to compute the areas of plain regions, surfaces and volume of solids.

COURSE CONTENT:

Unit I:
Definition of a line integral and basic properties, Evaluation of line integrals, Definition of double integral, Conversion to iterated integrals, Evaluation of Double integral, change of variables, Surface areas. Definition of a triple integral, Evaluation, Volume as a Triple integral.

Unit II:
Improper integrals of the first and second kinds, Convergence, Gamma and Beta functions, Connection between Beta and Gamma functions, Application to Evaluation of Integrals, Duplication formula, Sterling formula.

Unit III:
Quadratic Curves, surfaces, sphere, cylinder, cone, Ellipsoid, Hyperbloid, Parabloid, Ruled surfaces.

Unit IV:
Vectors, Scalars, Vector field, Scalar field, Vector differentiation, The Vector Differential operator del, gradient, curl, Vector integration, The Divergence theorem of Gauss, Stoke's Theorem, Green's Theorem in plane.

References

1. Calculus by Lipman Bers, Vols 1 and 2.
2. First Course in Calculus by Serge Lang
3. Calculus – Single and Multivariable by Hughes Hallet
4. Calculus and analytic geometry by Thomas and Finny.
5. Advanced Calculus by David Widder

Core Course 3 E : Zoology

BSE V.3B : DEVELOPMENTAL BIOLOGY AND APPLIED ZOOLOGY AND ETHOLOGY

Credits: 4 (3L+ 0T +1P) **Marks: 100**
Contact hrs per week: 5 **C1 + C2: 50**
Exam Duration: 2 hrs **C3: 50**

Objectives:

- To comprehend the modern concepts of developmental biology;
- To understand the developmental sequences in vertebrates;
- To compare the development of organs and systems in vertebrates with evolutionary significance;
- To identify the economically important animals and also to acquire knowledge with regard to control measures of economically harmful animals.

COURSE CONTENT:
UNIT I: GAMETOGENESIS AND DEVELOPMENT-I

a) **Gametogenesis**–Structure and types of sperm, Spermatogenesis; Structure and types of eggs, Oogenesis
b) **Fertilization**– Types, mechanism and its significances. Parthenogenesis
c) **Cleavage**– Characters, types, patterns of cleavage, planes of cleavages, factors influencing cleavage, fate map
d) **Gastrulation:** Morphogenetic movements
e) **Organizer phenomenon**– Organizer concept of Spemann, induction; competence, determination and differentiation

UNIT II: DEVELOPMENT-II

a) Development of chick up to three germ layers and neurulation .
b) Salient features of chick embryos of different ages – 19 hrs, 24 hrs, 33 hrs and 48 hrs, 72 hrs and 96 hrs of incubation
c) Extra-embryonic membranes of chick – development, structure and functions of amnion, chorion, yolk sac and allantois
d) Placenta in mammals– Structure, classification and types
e) Regeneration: Morpholaxis and epimorphosis

UNIT III: APPLIED ZOOLOGY

a) **Beneficial animals**: Basic principles: i) Sericulture ii) Apiculture iii) Aquaculture - fish, prawn and shell fish .
b) **Harmful animals**: Pests – morphology, life cycle, damages caused and control measures of common insect pests of stored food grains and crops, nematode pests of crops, insect vectors (each two); Control – biological control (pheromone traps) and integrated pest management (IPM)

UNIT IV: ETHOLOGY

Definition and objectives of Ethology ; Concept of motivation and releaser in behaviour; Innate behaviour, taxes, reflexes, instinctive behaviour (3); Learning, imprinting and its significance; biological clocks; Social behaviour in honey bees and monkey; Aggressive behaviour, Control of behavior.

References:

1. Developmental Biology by K.V.Sastry& Vinita Shukla – (Rastogi Publications, 2008)
2. Introduction to Embryology by B.I. Balinsky – (W.B. Saunders, Philadelphia)
3. A Hand Book of Sericulture by Iyonemura & M.N.RamaRao.
4. Bee keeping by J.E.Eckert and F.R.Shaw.
5. Economic Zoology by G.S. Shukla & V.B. Upadhya
6. Chordate Embryology by Verma PS &Agarwal VK – Chand & Co.
7. Animal Behaviour by V.G.Dethier and E Stellar -(Prentice hall of India, New Delhi)
8. The study of Instinct by N Tinbergen.
9. The Dancing Bees by K V Frisch
10. Learning and Instincts in Animals by W H Thorpe and W Homan

PRACTICALS

Exam Duration : 3 hrs **C3 : 50**

OBJECTIVES:

- To develop the skills of staining and mounting of embryos of chick;
- To understand the developmental patterns of chick and Frog;
- To acquire the skill of culturing silk worm, honey bees and fish;
- To acquire skill for effective control measures of economically harmful animals

COURSE CONTENT:

1. Study of different types of eggs (Insect, Frog, Hen)
2. Study of permanent slides of different developmental stages in Frog
    a) egg, b) early cleavage, c) morula, d) blastula, e) gastrula.
3. Study of permanent slides/different developmental stages of a) neural plate, b) neural fold, c) Early tadpole, d) hind limb stage, e) hind limb and fore limb stage, f) short tailed stage, g) young Frog.
4. Preparation of window on hen's egg to study development of embryo.
5. Incubation of fertilized egg of chick, preparation of permanent mounting of embryo from incubated egg and identification of age of the embryo.
6. Study of permanent slides of chick embryos of
    a) 13 hrs, b) 19 hrs, c) 24 hrs, d) 33 hrs, e) 48 hrs of incubation
7. Study of common insect pests of stored grains and crops.
8. Study of common insect vectors.
9. Study of economically important
    a) Fishes, b) crustaceans, c) molluscans.

10. Study of metamorphosis of Anuran tadpole larva
11. Study of Preferences: a) Preening behaviour in birds, b) Photo–, chemo–, and Geotaxes in *Drosophila*
12. Stimuli eliciting aggressive displays in male Siamese fighter fish; b) colour change in female Siamese fighter fish
13. Experiments with maze for studying behavioural motivation in rat

Sericulture Project – Moriculture, Collection of laying, incubation, black boxing, brushing, rearing, moulting, spinning, harvesting cocoons, reeling, raw silk (study of some economic traits – fecundity, larval duration, cocoon weight, shell weight and silk weight).

PROFESSIONAL EDUCATION COURSES

BSE V.4 :ASSESSMENT FOR LEARNING

Credits: 4 (3L+ 1T +0P) **Marks: 100**
Contact hrs per week: 5 **C1 + C2: 50**
Exam Duration: 2 hrs **C3: 50**

Objectives:
This course is designed to help student teachers to:

- Understand the nature of assessment and evaluation and their role in teaching- learning process.
- Understand the importance of assessment in continuous and comprehensive manner
- Plan assessment tasks, techniques, strategies and tools to assess learner's competence and performance in curricular and co-curricular areas,
- Devise marking, scoring and grading procedures,
- Analyse, manage and interpret assessment data.
- Devise ways of reporting on student performance
- Develop the skills of reflecting-on and self-critiquing to improve performance.

COURSE CONTENT:

Unit I: Introduction to Assessment & Evaluation

(a) Concept of test, measurement, Assessment, examination, appraisal and evaluation in education and their inter relationships.
(b) Purpose and objectives of assessment/ Evaluation- for placement, providing feedbacks, grading promotion, certification, diagnostic of learning difficulties.
(c) Importance of assessment & evaluation for Quality Education – as a tool in Pedagogic decision making (writing instructional objectives, selection of content, teaching learning resources, methodology, strategies & assessment procedures followed).
(d) Forms of assessment : -
    (i) (Formative, Summative, diagnostic; prognostic, placement; Norm referenced; Criterion referenced based on purpose)
    (ii) (Teacher made tests Standardized tests: based on nature & scope)

(iii) (Oral, written, performance: based on mode of response)
(iv) (Internal, External, self, peer, & teacher, group Vs individual- based on context)
(v) Based on nature of information gathered (Quantitative, Qualitative)
(vi) CCE, school based assessment ; Standard Based- based on Approach

(e) Recent trends in assessment and evaluations:
- Assessment for learning, assessment of learning and assessment as learning; Relationship with formative and summative, Authentic assessment.
- Achievement surveys- State, National and International; Online assessment; On demand assessment/ evaluation.
- Focus on Assessment and Evaluation in Various Educational commissions and NCFs

Unit II: Developing Assessment Tools, Techniques and Strategies -1

(a) Concept of Cognitive, Affective, Psychomotor domain of learning
(b) Relationship between educational objectives learning experiences and evaluation.
(c) Revised taxonomy of objectives (2001) and its implications for assessment and stating the objectives-
- Knowledge dimensions:- factual, conceptual, procedural and meta-cognition.
- Cognitive, Affective, Psychomotor domains – Classification of objectives

(d) Stating objectives as learning out comes: General, Specific.
(f) Construction of achievement tests- steps, procedure and uses (Teacher made test/Unit Tests)
- Constructing table of specifications & writing different forms of questions –(VSA, SA, ET & objective type, situation based) with their merits and demerits; assembling the test, preparing instructions, scoring key and marking scheme; and question wise analysis

(g) Construction of diagnostic test – Steps, uses & limitation; Remedial measures- need types and strategies
(h) Quality assurance in tools – Reliability: Meaning &Different methods of estimating reliability (Test-retest; equivalent forms, split- half); Validity: Meaning &Different methods of estimating reliability (Face, content, construct), Objectivity and Practicability/ Usability
(i) Inter dependence of validity, reliability and objectivity

Unit III: Developing Assessment Tools, Techniques and Strategies -II

(a) Concept of CCE, need for CCE its importance; relationship with formative assessment and problems reported by teachers and students
(b) Meaning & construction of process-oriented tools- Interview; Inventory; observation schedule; check-list; rating scale; anecdotal record;
(c) Assessment of group processes-Nature of group dynamics; Socio-metric techniques; steps for formation of groups, criteria for assessing tasks; Criteria's for assessment of social skills in collaborative or cooperative learning situations.
(d) Promoting Self assessment and Peer assessment – concepts and criteria's
(e) Portfolio assessment – meaning, scope & uses; developing & assessing portfolio; development of Rubrics

Unit IV: Analysis, Interpretation, Reporting and Communicating of student's performance

a) Interpreting student's performance
   (i) Descriptive statistics (measures of central tendency & measures of variability, percentages, rank correlation)
   (ii) Graphical representation (Histogram, Frequency Curves)

(b) Grading – Meaning, types, and its uses

(c) Norms – Meaning, types, and its uses

(d) Reporting student's performance – Progress reports, cumulative records, profiles and their uses, Portfolios, Using descriptive Indicators in report cards

(e) Role of feedback to stake holders (Students, Parents, Teachers) and to improve teaching – learning process; Identifying the strengths & weakness of learners.

Sessional Works

1. Discussion on existing assessment practices in schools and submitting the report.
2. Constructing a table of specification on a specific topic (subject specific)
3. Constructing a unit test using table of specifications and administering it to target group and interpreting the result.
4. Construction of any one of the process oriented tools and administering it to group of students & interpreting it.
5. Analysis of question papers: teacher made and various Boards
6. Analysis of report cards-State and Central (CBSE)
7. Analysis of various education commission reports and NCFs for knowing various recommendations on Assessment and Evaluation

References:

1. Ebel, R.L. and Fresbie, D.A. (2009).Essentials of Educational Measurement. New Delhi: PHI Learning PVT. LTD.
2. Garrett, H.E. (2008). Statistics in Psychology and Education. Delhi: Surjeet Publication.
3. Gupta, S.K. (1994). Applied Statistics for Education. Mittal Publications.
4. Mehta, S.J. & Shah, I.K. (1982).Educational Evaluation. Ahmedabad: Anand Prakashan (Gujarati).
5. NCERT (2015) Learning Indicator, New Delhi
6. NCERT (2015) CCE Packages, New Delhi
7. Rani, P. (2004).Educational Measurement and Evaluation. New Delhi: Discovery Publishers.
8. Rawat, D.S. (1970). Measurement, Evaluation and Statistics in Education. New Delhi: New Raj Book Depot.
9. Reynolds, C.R., Livingston, R.B., and Willson, V. (2011).Measurement and Assessment in Education. New Delhi: PHI Learning PVT. LTD.
10. Ten Brink, T.D. (1974). Evaluation – A Practical Guide for Teachers. New York: McGraw Hill Book Co.
11. Thorndike, R.M. (2010). Measurement and Evaluation in Psychology and Education. New Delhi: PHI Learning Pvt. Ltd.
12. Yadav, M.S. and Govinda, R. (1977). Educational Evaluation, Ahmedabad: Sahitya Mudranalaya.
13. Linn, Robert and Norman E Gronland (2000); Measurement and Assessment in

teaching, 8th edition, by Prentice Hall, Inc, Pearson Education, Printed in USA
14. Ved Prakash, et.al. (2000): Grading in schools, NCERT, Published at the publication Division by the secretary, NCERT, Sri Aurobindo Marg, New Delhi
15. Tierney, R. J., Carter, M. A., & Desai, L. E. (1991). Portfolio Assessment in the Reading – Writing Classroom. Norwood, MA: Christopher-Gordon Publishers
16. Glatthorn, A. A. (1998). Performance Assessment and Standards-based Curricula: the Achievement Cycle. Larchmont, NY: Eye no Education
17. Gredler, M. E. (1999). Classroom Assessment and Learning. USA: Longman.
18. Likert, R. (1932). A technique for the Measurement of Attitudes. Archives Psychology, 40.
19. Mehrens, W. A. & Lehmann, I. J. (1991). Measurement and Evaluation in Education and Psychology (8th ed.): Chapter 10: Describing Educational Data.
20. Oosterhof, A. (1994). Classroom Applications of Educational Measurement (Second Edition). New York: Macmillan College Publishing Company Inc.
21. Payne, D.A (2003).Applied Educational Assessment. Australia: Wadsworth: Thomson Learning.
22. Popham, W.J. (1981). Modern Educational Measurement. New Jersey, Engle Wood Cliffs: Prentice-Hall Inc.
23. Popham, W. J. (2002). Classroom Assessment: What teachers need to know (Third Edition). Boston: Allyn& Bacon.

Web Resources

1. Assessment in school education, (2013) http://azimpremjifoundation.org/sites/default/files/userfiles/files/Issue%20XX%20Section%20C.pdf
2. Compendium of Tools, (2013), CBSE
3 http://cbse.nic.in/ePub/webcbse/webcbse/Revised%20Compendium%20of%20Tools/Revised%20Compendium%20of%20Tools/docs/Revised%20Compendium%20of%20Tools.pdf
4. http://www.cbse.nic.ib/cce/index.html
5. www.ncert.nic.in
6. http://nroer.in/home/

BSE V.5 :Pedagogy of Physical Science 1

Credits: 4 (2L+ 2T +0P) **Marks: 100**
Contact hrs per week: 6 **C1 + C2: 50**
Exam Duration: 2 hrs **C3: 50**

Objectives:

Student teachers will be able to

- Explain the nature of science.
- Specify the goals and objectives of science teaching.
- Review the contributions of major scientists.
- Explore several methods of teaching science.
- Apply various theories science learning and analyze the implications for teaching science.
- Review the science curriculum, syllabus, and text books.
- Explore constructivist practices in teaching of science.
- Create unit plans, lesson plans in an artistic and scientific way.
- Explore the inter-relation between science and other subjects.

COURSE CONTENT:

Unit I: Nature of Science

Nature of science -Scientific method, how science works, science as a process and product. Science as a way of thinking: inquiry, observation, problem-solving, rational thinking, reasoning, science as an empirical body of knowledge. Structure of knowledge: facts, concepts, principles, generalizations, theories. Historical development of physical science with illustrations from topics such as structure of atoms, laws of chemical combinations, stoichiometry, equivalent mass, models of the universe, nature of light, electricity and magnetism etc. Contributions of Indian and international figures in science to the knowledge domain of physical science. Basic branches of physical science and applications of physical science to human life. Evolution of Physical Science as a knowledge field; science and technology; science and society; inter-relation between science and other subjects, sole of science teacher.

Unit II:

a. Aims and learning objectives of Physical Science

Aims of teaching physical science in the school curriculum.

Development of process skills of science, scientific attitude and temper by learning Physics and Chemistry as experimental sciences.

Nurturing curiosity, creativity and aesthetic sense.

Science and society– relating physical science with the natural and social environment and technology, relating science to daily life, social interaction and science.

Values through science teaching-open mindness, objectivity, truthfulness, critical thinking, logical thinking, development of problem solving skill, social learning.

Ethics of using the knowledge of science and technology.

b. Physical Science Curriculum

Recommendations of major commissions in India and policies on science teaching.
The school science curriculum with regard to NCF 2005: major themes in secondary school science.
Brief study of famous curricular reform projects such as Nuffield, STEM, PSSC, Chemical Bond Approach, CHEMSTUDY etc.
Comparison of international secondary schools science syllabus- Singapore, Oxford, CIE (Cambridge).

Unit III: Pedagogical shift, Approaches and Strategies of learning Physical Science

Role of prior knowledge in constructing new knowledge (Ausubel), Piaget's theories of learning (schema- disequilibrium).
Development of concepts in Science- real-life as the basis of conceptions; personal vs. verified knowledge of science. Conceptions, alternate concepts, and misconceptions in science.
Teaching concepts and generalizations, inductive approaches, using advance organizers, problem solving approach, investigatory approach, project method, cooperative learning method.
Vygotsky's theories of role of language and context in learning, Van Glasersfeld's theory. Development of constructivist practices in science teaching, 5E learning model, 7E model, conceptual change model of teaching, challenges in using constructivism in the classroom.
Collaborative learning approach, problem solving approach, concept mapping, experiential learning, cognitive conflict, inquiry approach, analogy strategy.
Facilitating learning: teacher's role as a facilitator, grouping students, multiple learning experiences, discussing ideas, scaffolding, consolidating students' ideas, questioning- techniques and strategies, higher order and metacognitive questioning.
Maintaining positive learning environment. Catering to children with varied needs and abilities, context in learning, gender and science.
Scope and importance inclusiveness in science class room.
Role of learner: each learner as unique individual, involving learner in learning process, role of learner in negotiating and mediating learning, encouraging learner to raise and ask questions.

Unit IV: Planning for Physical science Teaching-learning

Importance of planning, unit plan and lesson plan.
Anderson and Krathwohl's revised Bloom's taxonomy: knowledge domains and cognitive processes, action words. types of knowledge- factual, conceptual, procedural and metacognitive knowledge.
Identification and organization of concepts.
Elements of physical science lesson plan: learning Objectives, introduction, development, assessment, extended learning, assignment.
Designing learning experiences, pre-existing knowledge, selecting approach/strategy, arrangement of teaching learning materials, group learning, formation of groups, organizing activities.
Planning the lesson by using ICT applications and laboratory materials.
Reflective planning; unit plan; developing lesson plans on different topics and through various approaches taking examples form upper primary, secondary and higher secondary stage (physical and chemical changes, redox reaction, light, magnetic effect of electric current, etc.).

Sessional Activities:

- Presentation on historical development of science concepts with a view to understand the nature of science.
- Pedagogical analysis (units for pedagogic analysis: any unit from VIII, IX or X physical science textbook).
- Drawing concept-maps for secondary level concepts.
- Presentation on the contributions of Physicists and Chemists to physical science.
- Readings on curriculum initiatives in secondary science with a special reference to NCF 2005.
- Comparison of different science curricula.
- Lab demonstration/exploration of science experiments.
- Exploring common mis-concepts in Physical Science by observing science classes or interviewing science teachers or using VIII and IX textbooks.
- Stating learning objectives for teaching a topic in science.
- Demonstration of different methods of teaching of Physical Science.
- Experimentation of different methods of teaching of Physical Science.

References :

1. Pedagogy of Physical Science, Text book for B.Ed, Part I, NCERT
2. Pedagogy of Physical Science, Text book for B.Ed, Part II, NCERT
3. National Curriculum Framework 2005, NCERT, New Delhi.
4. Steve Alsop, Keith Hicks (2007). Teaching Science : A Handbook for Primary and Secondary School Teachers, Kogan Page, New Delhi.
5. Judith Bennett (2003) Teaching and Learning Science : A guide to recent research and its applications, Continuum, London.
6. Robin Millar (1984) Doing Science : Images of Science in Science Education, The Falmer Press, London.
7. State Textbook in Physics and Chemistry for classes VIII, IX and X.
8. Nathan S Washton (1967). Teaching Science Creatively, Saunders Company, London.
9. History of Physics in the 20th Century, Internet Browsing.
10. Novak D J and D Bob Gowin (1984) Learning how to learn, Press Syndicate of the University of Cambridge, Ohio.111
11. Carin A and B R Sund (1964), Teaching Science through Discovery, Charles E. Merrill Books Inc.,
12. Columbus Ohio. 11. Ralph Martin, Colleen Sexton, Kay Wagner, Jack Gerlovich (2000) Science for All Children: Methods for Constructing Understanding, Allyn and Bacon, London.
13. School Science Review, The Association for School Education, College Lane, Hatfield, Hertfordshire, AL 109 AA, UK.
14. Physics Education, Institute of Physics Publishing, Dirac House, Temple Block, Bristol BS1 6BE, UK.
15. Physics Teacher, American Association of Physics Teachers, Department of Physics and Astronomy, University of Maryland, College Park, MO 20742.
16. Kamala Mukunda, 2009. What did you ask at school today? A Handbook on Child Learning.
17. Donald Schon,(1983) The reflective practitioner, How professionals think in Action Basic Books, ISBN 0465068782
18. Donald A. Schon, (1987) Educating the Reflective Practitioner: Toward a New Design for Teaching and Learning in the Professions. San Francisco, Jossey-Bass, 1987 ISBN: 978-15-5542-220-2

BSE V.6A :Pedagogy of Mathematics 1

Credits: 4 (2L+ 2T +0P) **Marks: 100**
Contact hrs per week: 6 **C1 + C2: 50**
Exam Duration: 2 hrs **C3: 50**

Objectives:
On completion of the course the students will have

- understanding of nature of mathematics and its branches
- ability to analyse the relationship of mathematics within itself and with other subjects
- ability to categories mathematical knowledge into factual, conceptual, procedural and meta cognitive knowledge
- Appreciates the contributions made by Indian and other country mathematicians contribution
- ability to apply logical reasoning and problem solving ability in solving various mathematical problems

Unit I: Knowledge about Mathematics

Nature of mathematics- abstractness, preciseness, brevity, language and symbolism; Nature of mathematical propositions; Quantifiers- necessary and sufficient conditions(one and two way); structure of mathematics- undefined terms, defined terms, definitions, axioms, postulates and theorem; mathematical theorem and its variants- converse, inverse and contra positive; Pure and Applied mathematics; branches of mathematics- Arithmetic, algebra, geometry and their diversities; mathematization through- observation, conjecturing, hypothesing, testing and verifying; creation of conceptual knowledge and its importance; creation of procedural knowledge- derivation of laws/ theorems/ generalizations in mathematics; relationship of mathematics among different branches of science; relationship within and among branches of mathematics; Contribution of Indian and other Mathematician- Aryabhatta, Bhaskara, Raman jam, Guass, Euclid, Descarte, Cantor, Pythagoras;
Organization of Mathematical content- horizontal and vertical linkage (within and between classes IX and X); linkage between upper primary, secondary and senior secondary mathematics.

Unit II: Aims and objectives of teaching Mathematics

Aims of mathematics- Cultural, disciplinary, moral, social and utilitarian aims; General objectives of teaching mathematics Vis-a-Vis the objectives of secondary education; Major shifts in classroom teaching (societal and technological influence); characteristics of a good instructional objectives; Writing specific objectives of different content categories in mathematics; Unit plan and Lesson plan-its importance and writing unit plan and lesson plan for mathematics lessons using the format.

Unit III: Strategies for learning mathematical concepts

Nature of concepts, types of concept, process of concept formation; Moves in teaching concepts- a) Exemplar moves- giving examples and non-examples (with or without reasoning); comparing and contrasting ; giving counter example b) Characterization move- definition, stating necessary and/or sufficient condition; concept Attainment Model (Bruner);

Advance Organizer Model (Ausubel); Planning and implementation of strategies for teaching various mathematical concepts(secondary level maths)

Unit IV: Teaching of Generalization

Teaching by exposition- Moves in teaching generalization:- Introductory move, focus move, objective move, motivation move, assertion move, application move, interpretation move, justification move; Planning for expository strategies of teaching generalization.

Teaching by guided discovery- nature and purpose of learning by- discovery, inductive, deductive, guided discovery strategies; maxims for planning and conducting discovery strategies; planning strategies involving either induction or deduction or both.

Sessional work:

Analysis of secondary level mathematics text books to identify various categories of mathematical knowledge presented and its horizontal and vertical linkage among 8, 9 and 10 standard text books.

Analysing the structure of mathematics present in selected chapter/unit.

Writing a unit plan for selected unit

Writing of specific instructional objectives for selected unit

Writing a lesson plan on selected content area

Writing a plan for teaching a concept of a generalization using the appropriate moves to teach them.

References:

1. Butler and Wren (1965), The Teaching of Secondary Mathematics- Fourth Edition, London, McGraw Hill Book company
2. Cooney T J and others (1975), Dynamics of Teaching Secondary School Mathematics, Boston: Houghton Miffilin
3. Focus Group Report (2005), Teaching of Mathematics, New Delhi, NCERT
4. Iglewiez, Boris and Stoyle, Judith (1973), An Introduction to Mathematical Reasoning, New York, the McMillan company
5. John Stillwell(1989), Mathematics and its History- undergraduate Texts in Mathematics, Newyork,Springer-Verlag New York Inc
6. NCERT, A textbook of Content-Cum-Methodology of Teaching Mathematics, New Delhi, NCERT
7. NCERT(2012), Pedagogy of Mathematics- textbook for Two year B.Ed course, New Delhi
8. Polya george (1957), How to solve it, Garden city, New York, Doubleday
9. Robert B Davis (1984),Learning Mathematics-The cognitive approach to Mathematics Education, Sydney, Croom Helm Australia Pty Ltd
10. Servas W and T varga, Teaching school Mathematics- UNESCO source book
11. T V Somashekar, G Viswanathappa and Anice James (2014), Methods of Teaching Mathematics, Hyderabad, Neelkamal publications Pvt Ltd

BSE V.6B :Pedagogy of Biological Science 1

Credits: 4 (2L+ 2T +0P) **Marks: 100**
Contact hrs per week: 6 **C1 + C2: 50**
Exam Duration: 2 hrs **C3: 50**

Objectives:
At the end of the programme, students are able to

- explain the nature of science
- specify the goals and objectives of science teaching
- demarcate science from other pursuits of knowledge
- get a glimpse of the major turning points in the history of biology
- review the contributions of major biologist
- apply the learning theories in teaching of biological science
- review the science curriculum, syllabus, and text books
- perform content analysis of secondary school biological units
- write instructional objectives using revised taxonomy
- plan and develop unit and lesson plans

COURSE CONTENT:
Unit I:Nature of Science
Science as a way of thinking: Inquiry, observation, problem-solving, rational thinking, reasoning and scientific attitude; Science as a way of investigation: scientific method, science process skills; Science as an empirical body of knowledge: Structure of Knowledge, Facts, Concepts, principles, Generalisations, theories; Process and Product of Science
Historical development of biological Science with special reference to those included in the school curriculum; evolution of biological science as a knowledge field; theories contributing to modern biology (cell theory, theory of evolution by natural selection, gene theory, and homeostasis),
Contributions of Indian and International biologist to the knowledge domain of biological science, basic branches of biological science and applications of biology to human life.
Science and technology ; Science and society ; inter-relation between Science and other subjects

Unit II: Theoretical basis of science teaching
Applying Learning theories in teaching of biological science: process of concept formation; Development of conceptions in Science, Conceptions, alternate conceptions and misconceptions in science,
Role of prior knowledge in constructing new knowledge (Ausubel), Piaget's theories of learning (schema- disequilibrium), Vygotsky's theories-role of language, ZPD and scaffolding in learning, Van Glasersfeld's theory; Spiral curriculum and discovery learning (Bruner),
Metacognition, development of constructivist practices in science teaching, conceptual change model of teaching.

Unit III: Biological Science Curriculum

Aims of teaching biological science in secondary schools
Recommendations of major commissions and policies on science teaching
The school science curriculum with regard to NCF: major themes in secondary school science
Brief study of famous curricular reform projects such as Nuffield, BSCS, and Project 2061
Biological science syllabus of secondary schools
Analysis of science text books

Unit IV: Planning for Biology Teaching

Content Analysis; An analysis of the major themes of secondary school science (facts, concepts, laws, theories); Concept mapping: role and procedure, studying linkages between concepts within the same subject and across subjects
Objectives of teaching science using revised Bloom's taxonomy: Knowledge domains and cognitive processes, Types of knowledge- factual, conceptual, procedural and metacognitive knowledge, and action words.
Principles of teaching biological science: Science as inquiry, development of process skills of Science, scientific attitude and critical thinking, relating Science to daily life, Science and society.
Unit plan and Lesson plan: stating objectives, selecting the content, designing learning experiences, selecting approach/strategy, questioning, assessment and evaluation.

Sessional Activities

- Developing timelines of development of biological knowledge/contributions of biologist
- Historical development of Science concepts- Poster presentation/concept maps
- Analysis and presentation of biological theories and models
- Timelines of current trends and future predictions of biological science
- Background readings on history of science, philosophy of science
- Observation of a biology classroom
- Exploring common misconceptions in Physical Science by observing Science classes or interviewing Science teachers/ from VIII and IX textbook
- Viewing and discussion on documentary on various biologist
- Performing textbook analysis using specified criteria
- Analysis of secondary school science textbook
- Content analysis of selected secondary school biology unit
- Concept analysis and mapping of the selected unit in biology
- Critical review of a few curricular reforms
- Developing a unit plan for a selected biology unit
- Lesson planning using various approaches including BSCS 5E model

References

1. Amanda Berry, et.al. (2015). Re-examining Pedagogical Content Knowledge in Science Education (Teaching and Learning in Science Series). Routledge: New York
2. Carin A and B R Sund (1964), Teaching Science through Discovery, Charles E. Merrill Books Inc.,
3. David Sang & Robert Frost (2005). Teaching Secondary Science Using ICT
4. DK Publishing (2013). Timelines of Science
5. Don P. Kauchak,& Paul D. Eggen (2013). Introduction to Teaching: Becoming a

Professional (5th Edition)
6. Ernst Mayr (1985).The Growth of Biological Thought: Diversity, Evolution, and Inheritance
7. J. A. Cover, Martin Curd, & Christopher Pincock (2012).Philosophy of Science: The Central Issues (Second Edition)
8. Jeffrey Bennett (2014). On Teaching Science: Principles and Strategies That Every Educator Should Know. Big Kid Science: Boulder,CO
9. John Gribbin.(2004).The Scientists: A History of Science Told Through the Lives of Its Greatest Inventors. Random House:New York
10. Judith Bennett (2003) Teaching and Learning Science : A guide to recent research and its applications, Continuum, London.
11. Lois N. Magner (2002).A History of the Life Sciences, Revised and Expanded
12. Michael F. Fleming (2002).Biology Teacher's Survival Guide: Tips, Techniques & Materials for Success in the Classroom
13. Michael Reiss (2012). Teaching Secondary Biology (Ase Science Practice). Hodder Education: London
14. Nathan S Washton (1967). Teaching Science Creatively, Saunders Company, London.
15. National Curriculum Framework 2005, NCERT, New Delhi.
16. Novak D J and D Bob Gowin (1984) Learning how to learn, Press Syndicate of the University of Cambridge, Ohio.111
17. BSCS (2009)The Biology Teacher's Handbook, 4th Edition
18. Ralph Martin, Colleen Sexton, Kay Wagner, Jack Gerlovich (2000) Science for All Children: Methods for Constructing Understanding, Allyn and Bacon, London.
19. Robert J. Marzano.(2007). The Art and Science of Teaching: A Comprehensive Framework for Effective Instruction (Professional Development). ASCD:Alexandria, VA
20. Rodger W. Bybee, et.al. (2007). Teaching Secondary School Science: Strategies for Developing Scientific Literacy (9th Edition)
21. Sally McKeown (2012). Brilliant Ideas for Using ICT in the Inclusive Classroom. Routledge:New York
22. Samir Okasha (2002).Philosophy of Science: A Very Short Introduction. Oxford UnversityPress:Oxford
23. Sandra K Abell,& Mark J Volkmann. (2006). Seamless Assessment in Science: A Guide for Elementary and Middle School Teachers
24. Stephen P. Gordon. (2003). Professional Development for School Improvement: Empowering Learning Communities
25. Steve Alsop, Keith Hicks (2007). Teaching Science: A Handbook for Primary and Secondary School Teachers, Kogan Page, New Delhi.
26. Susan Loucks Horsley et.al. (2009). Designing Professional Development for Teachers of Science and Mathematics. Sage:New Delhi
27. Thomas S. Kuhn (2012). The Structure of Scientific Revolutions: 50th Anniversary Edition. University of Chicago Press:Chicago
28. WestEd, & WGBH Boston (2003).Teachers as Learners: A Multimedia Kit for Professional Development in Science and Mathematics

SIXTH SEMESTER

Core Course 1F : Physics

BSE VI.1A :CLASSICAL & QUANTUM MECHANICS AND SPECIAL THEORY OF RELATIVITY

Credits: 4 (3L+ 0T +1P) **Marks: 100**
Contact hrs per week: 5 **C1 + C2: 50**
Exam Duration: 2 hrs **C3: 50**

Objectives: To enable students to understand the essentials of classical mechanics, quantum mechanics, quantum statistics and relativity.

COURSE CONTENT:

Unit I: Lagrangian formulations of Classical Mechanics

Constraints- sclerenomic and rheonomic constraints, holonomic and non holonomic constraints, Generalized co-ordinates and velocities, Principle of virtual work, D'Alembert's principle, Euler- Lagrange equations, Cyclic co-ordinates, Conservation laws and symmetry properties, applications of Lagrangian formulation (simple pendulum). Canonical momenta & Hamiltonian of a system. Hamilton's equations of motion. Hamiltonian for a harmonic oscillator.

Unit II: Special Theory of Relativity

Galilean transformation, Earth as an inertial frame of reference, Constancy of speed of light, Ether hypothesis, Michelson-Morley experiment, Postulates of Special Theory of Relativity, Lorentz transformations. Simultaneity and order of events. Length contraction, Time dilation, Relativistic transformation of velocity, frequency and wave number. Relativistic addition of velocities. Variation of mass with velocity. Massless Particles. Mass-energy Equivalence. Relativistic Doppler effect. Relativistic Kinematics. Transformation of Energy and Momentum.

Unit III: Origin of Quantum Theory

Qualitative discussions on inadequacies of Classical Physics– black body radiation and photoelectric effect, Planck's hypothesis and explanation of black body radiation, Einstein's explanation of photoelectric effect with derivation, Wave-particle duality, de Broglie's hypothesis of matter waves, concept of group velocity and phase velocity and their relationship, experimental evidence for matter waves– Davisson and Germer experiment, electron diffraction experiment. Uncertainty Principle.

Unit IV: Development and application of Schrodinger Equation

Wave function, interpretation of wave function, postulates of quantum mechanics, probability density, Eigen functions and eigen values, expectation values, Normalization of wave functions, development of time dependent and time independent Schrodinger wave equation, operator method of deriving Schrodinger equation. Applications of Schrodinger wave equation– one dimensional infinite potential well, finite potential well, phenomenon of tunneling, one dimensional harmonic oscillator, hydrogen atom (only qualitative discussion).

Reference Books:

1. Arthur Beiser, Perspectives of Modern Physics, McGraw-Hill Inc.,US; International edition edition.
2. H.Goldstein, C.P. Poole, J.L. Safko, Classical Mechanics 3rd Edn., Pearson Education, 2002.
3. L. D. Landau and E. M. Lifshitz, Mechanics, Pergamon, 1976.
4. P.S. Joag, N.C. Rana, Classical Mechanics 1st Edn., McGraw Hall.
5. R. D. Gregory, Classical Mechanics, Cambridge University Press, 2015.
6. L. I. Schiff, Quantum Mechanics, 3rd Edn., Tata McGraw Hill, 2010.
7. R. Shankar, Principles of Quantum Mechanics 2nd edition, Springer, 2014.
8. David J Grifith, Introduction to Quantum Mechanics, Addison Wesley; 2 edition, 2004.
9. P. M. Mathews and K. Venkatesan, A Text book of Quantum Mechanics, 2nd edition, McGraw Hill, 2010.
10. R. Eisberg and R. Resnick, Quantum Mechanics, 2nd edition, Wiley, 2002.
11. G. Aruldhas, Quantum Mechanics, 2nd edition, PHI Learning of India, 2002.
12. C. Reed, Quantum Mechanics, Jones and Bartlett Learning, 2008.

PRACTICALS

Exam Duration: 3 hrs **C3: 50 Marks**

Objectives:

- To provide training in the broad methodology of science through investigatory type and open-ended laboratory exercises.
- To validate the theoretical basis of the experiments.

COURSE CONTENT:

(A minimum of TEN experiments to be selected from the following)

1. Stefan's constant.
2. Planck's constant using LED's (3no.s).
3. Absorption spectra.
4. Photoelectric effect.
5. Variation of resistance with temperature of copper wire (10 mts).
6. Laser Diffraction.
7. Laser-wavelength using transmission grating.
8. Photo conductivity using LDR.
9. Photovoltaic cells.
10. Numerical aperture of an optical fibre by semiconductor laser.

11. BG Absolute Capacity.
12. BG-High resistance by leakage method
13. BG Mutual inductance
14. e/m of electron.
15. Verification of inverse square law for light using photodiode.
16. Diffraction of light. Determination of wavelength λ.
17. Characterization of photo diode.

Reference Books:

1. B.L.Flint & H.T.Worsnop, Advanced Practical Physics for students, Asia Publishing House, 1971.
2. E Armitage, Practical Physics, John Murray.
3. PSSC Physics Laboratory Guide.
4. S.Panigrahi & B.Mallick, Engineering Practical Physics, Cengage Learning India Pvt. Ltd., 2015
5. Indu Prakash and Ramakrishna, A Text Book of Practical Physics, 11th Edition, Kitab Mahal, New Delhi, 2011.
6. Jerry D Wilson and Cecilia A. Hernández-HallPhysics Laboratory Experiments7th Edition, Cengage Learning, 2009.
7. S.Panigrahi & B.Mallick, Engineering Practical Physics, Cengage Learning India Pvt. Ltd., 2015.
8. Michael Nelson and Jon M. Ogborn, Advanced level Physics Practicals, 4th Edition, reprinted, Heinemann Educational Publishers, 1985.

Core Course 1 F Botany

BSE VI.1B :PLANT PHYSIOLOGY AND METABOLISM

Credits: 4 (3L+ 0T +1P) **Marks: 100**
Contact hrs per week: 5 **C1 + C2: 50**
Exam Duration: 2 hrs **C3: 50**

Objectives:
- To acquaint students with the sub-cellular physiological phenomena in plants;
- To understand the water relations in plants;
- To understand the functioning of plant from the physiological point of view;
- To understand various facets of growth, differentiation and physiology of flowering in angiosperms.

COURSE CONTENT:

Unit I :
a) Importance of water to plant life, properties of water.
b) Review of diffusion, osmosis and imbibition – definitions, concept of water potential, osmotic potential, pressure potential, solute potential, role of aquaporins.

c) Absorption of water : Root as an absorbing organ, mechanism and pathways of water movement from root hair to root xylem - symplast, apoplast and trans-membrane pathways.
d) Ascent of sap : Vertical pathway of water in plants, structural properties of xylem, root pressure theory, cohesion – tension hypothesis.

Unit II :
a) Transpiration: Definition, types, mechanism of stomatal opening and closing (role of K+ and Abscisic acid), antitranspirants, factors and significance of transpiration, guttation.
b) Cellular Respiration: Introduction, respiratory quotient, aerobic and anaerobic respiration, structure of mitochondrion, glycolysis, synthesis of acetyl CoA, Krebs cycle, oxidative phosphorylation, electron carrier complexes, chemiosmotic hypothesis, proton pump theory, synthesis of ATP (Paul Boyer's hypothesis), pentose phosphate pathway.

Unit III:
a)Photosynthesis: Introduction, brief history, ultrastructure of chloroplast, photosynthetic pigments, absorption and action spectra, photochemical (light) reaction, photophosphorylation, Z-scheme, Calvin cycle, C4 pathway, CAM pathway, photorespiration, factors and significance of photosynthesis.
b)Transport of Organic Substances : Ultrastructure and functions of phloem, (sieve tube), mechanism of phloem transport, source – sink relationship, theories and factors affecting photosynthesis.
c)Mineral Nutrition: Major and micro-nutrients, absorption of mineral salts, mechanism and theories of mineral uptake; passive absorption – mass flow, Donnan equilibrium: active absorption – carrier concept, cytochrome pump hypothesis.
Role of N, P, K, Ca, Mg, Fe, N and Zn in plant metabolism, Mineral deficiency symptoms.

Unit IV :
a) Growth and Development : Definitions, phases of growth and development, photomorphogenesis, brief account of phytochromes – discovery, physiological role and mechanism of action.
b) Plant growth Regulators : General account, discovery, chemical nature, physiological effects and applications of auxins, kinins, gibberellins, ethylene and abscisic acid. Brief account of plant movements.
c) Physiology of flowering : (i) Brief account of photoperiodism, short day, long day and day-neutral plants, night interruption phenomenon, florigen concept, role of phytochromes (ii) Brief account of vernalization.

References:

1. Taiz,L. and E.Zeiger, 1998, Plant Physiology (2nd Ed.), Sinauer Associates Inc. USA.
2. Salisbury, F.B. and C.W.Ross, 1992, Plant Physiology (4th Ed.) Wadsworth Publishing Co.USA.
3. Leo, P.J. and R.C.Leegood, 1999, Plant Biochemistry and Molecular Biology, John Wiley & Sons, England.
4. Hopkins, W.J.1995, Introduction to Plant Physiology, John Wiley and Sons, Inc., New York.
5. Lehninger A.B.,1982, Principles of Biochemistry, CBS Publishers and Distributors, New Delhi.
6. John, J.L., 1994, Fundamentals of Biochemistry, Sultanchand & Co., New Delhi.

7. Srivastava, H.S., 2005, Plant Physiology, Biochemistry and Biotechnology, Rastogi Publications, Meerut.
8. Srivastava H.S. and N Shankar, 2006, Plant Physiology and Biochemistry, Rastogi Publications, Meerut.

PRACTICALS

Exam Duration : 3 hrs **C3 : 50**

Objectives :

- To understand the functioning of a plant from the physiological point of view.
- To enable students to handle glasswares and equipment to set up physiology experiments.
- To study responses of plants by manipulating the variables.

COURSE CONTENT :

1. Preparation of different types of solutions – molal, molar, percent and normal solutions.
2. To study the effect of temperature and organic solvents on permeability of plasma membrane.
3. Determination of osmotic potential by plasmolytic method.
4. Determination of water potential of potato tuber.
5. Calculation of stomatal index, frequency and area of stomatal aperture in the two surfaces of leaves.
6. Determination of the rate of transpiration in two surfaces of leaf by cobalt chloride method.
7. Demonstration of transpiration pull.
8. Separation of photosynthetic pigments by paper chromatography.
9. Comparison of rate of photosynthesis under different environmental conditions.
10. Demonstration of necessity of light, CO2 and chlorophyll for photosynthesis.
11. Plotting the absorption spectrum of chlorophylls.
12. Quantitative estimation of chlorophylls by colorimetry.
13. Demonstration of aerobic and anaerobic respiration.
14. Demonstration of phototropism and geotropism.
15. Study the distribution of growth in roots.
16. Observation of cyclosis in plant materials.
17. Testing the germinability of seeds using TTC.

Core Course 2FChemistry

BSE VI.2 :ORGANIC CHEMISTRY – II

Credits: 4 (3L+ 0T +1P) **Marks: 100**
Contact hrs per week: 5 **C1 + C2: 50**
Exam Duration: 2 hrs **C3: 50**

Objectives:
To develop an understanding of the chemistry of Functional groups and mechanism of Organic Reactions.

COURSE CONTENT:

Unit I: Alcohols and Phenols

Monohydric alcohols: Nomenclature, methods of formation (reduction of aldehydes, ketones, carboxylic acids and esters). Hydrogen bonding, Acidic nature. Reactions of alcohols (oxidation, esterification, dehydration).
Dihydric alcohols: Nomenclature, methods of formation (from alkenes and alkyl dihalides), chemical reactions of vicinal glycols-oxidative cleavage [$Pb(OA_c)_4$ and HIO_4] and Pinacol-pinacolone rearrangement.
Trihydric alcohols: Nomenclature and methods of formation(from alkenes and alkenals), chemical reactions of glycerol (with nitric acid, oxalic acid and HI).
Phenols: Nomenclature, structure and bonding, Preparation of phenol, resorcinol and 1 and 2- naphthols (one method each). Physical properties and acidic character of phenol. Comparative acidic strengths of alcohols and phenols, resonance stabilization of phenoxide ion. Reactions of phenols: Electrophilic aromatic substitution, acylation and carboxylation. Mechanisms of Fries rearrangement, Claisen rearrangement, Gatterman synthesis, Houben-Hoesch reaction, Lederer-Manasse reaction and Reimer-Tiemann reaction.

Unit II: Carbonyl Compounds
Aldehydes and Ketones
Nomenclature and structure of carbonyl group. Synthesis of aldehydes and ketones with particular reference to the synthesis of aldehydes from acid chlorides, synthesis of aldehydes and ketones using 1,3-dithianes, synthesis of ketones from nitriles and from carboxylic acids. Physical properties. Mechanism of nucleophilic addition to carbonyl group with particular emphasis on benzoin, aldol, Perkin and Knoevenagel condensations. Use of acetals as protecting group. Baeyer-Villiger oxidation of ketones, Cannizzaro reaction. MPV, Clemmensen, Wolff-Kishner, $LiAlH_4$ and $NaBH_4$ reductions. Halogenation of enolizable ketones. An introduction to σ, β unsaturated aldehydes and ketones.

Carboxylic Acids and their Derivatives
Nomenclature, structure and bonding. Preparation of carboxylic acids – by oxidation, using Grignard reagents and hydrolysis of nitriles. Physical properties, acidity of carboxylic acids, effect of substituents on acid strength. Reactions of carboxylic acids: HVZ reaction, synthesis

of acid chlorides, esters and amides. Reduction of carboxylic acids. Mechanism of decarboxylation. Methods of formation and chemical reactions hydroxy acids – malic, tartaric and citric acids.

Unsaturated monocarboxylic acids: Methods of formation and chemical reactions
Dicarboxylic acids: Methods of formation and effect of heat and dehydrating agents.
Carboxylic acid derivatives: Structure and nomenclature of acid chlorides, esters, amides and acid anhydrides. Preparation of carboxylic acid derivatives, chemical reactions. Mechanism of esterification and hydrolysis (acid, base conditions).

Unit III: Organic synthesis via Carbanions

Synthesis of ethyl acetoacetate by Claisen condensation and diethyl malonate. Acidity of α – hydrogens, alkylation of diethyl malonate and ethyl acetoacetate. Synthetic applications of malonic ester: dicarboxylic acids – succinic acid and adipic acid; α,β – unsaturated acids – crotonic acid and cinnamic acid; barbituric acid.
Synthetic applications of acetoacetic ester: dicarboxylic acids – succinic acid and adipic acid; α, β – unsaturated acids – crotonic acid and cinnamic acid; antipyrine, uracil and acetyl acetone. keto-enol tautomerism of ethyl acetoacetate. Alkylation of 1,3-dithianes, Alkylation and acylation of enamines.

Unit IV: Organic Compounds of Nitrogen

Nitro Compounds: Introduction, Preparation of nitroalkanes and nitroarenes. Chemical reactions of nitroalkanes. Mechanism of nucleophilic substitution in nitroarenes and their reductions in acidic, neutral and alkaline media. Picric acid.
Aliphatic and Aromatic amines: Structure and nomenclature of amines, Preparation of alkyl and aryl amines (reduction of nitro compounds, nitrites), reductive amination of aldehydic and ketonic compounds. Gabriel-phthalimide reaction, Hofmann bromamide reaction. Reactivity, physical properties, stereochemistry of amines. Separation of a mixture of primary, secondary and tertiary amines (Hinsberg's method). Structural features effecting basicity of amines. Amine salts as phase – transfer catalysts. Reactions of amines, electrophilic aromatic substitution in aryl amines, reactions of amines with nitrous acid. Synthetic transformations of aryl diazonium salts and azo coupling.

References :

1. Advanced organic chemistry Arun Bahl and B.S. Bhal
2. Organic Chemistry:Reagents and Reactions Agrawal, Goel Publishing House 53rd edition 2015
3. Organic Chemistry John Macmumy 9th Edition 2016.
4. Organic Chemistry J.Clayden,N.Greeves and S.Warren 2nd Edition 2012 Oxford University Press.

PRACTICAL

Exam Duration : 3 hrs **C3 : 50**

Objective:

- To develop basic skills of separation of organic compounds and evolve a scheme of analysis of organic compounds based on properties of functional groups for identification
- To develop skills of separation techniques

COURSE CONTENT:

1. Qualitative organic analysis

1. Separation of organic mixtures containing two solid components using water , $NaHCO_3$, NaOH

2. Analysis of an organic compound: Detection of extra elements (N,S and X) and functional groups (phenolic, carboxylic, carbonyl, esters, carbohydrates, alcohols, amines, amides, nitro and anilides) in simple organic compounds. Identification of organic compound based on functional group analysis, determination of physical constant (mp / bp).

2. Chromatographic Techniques

(i) Thin Layer Chromatography

(a) Determination of R_f values and identification of organic compounds:
(b) Identification of plant pigments by thin layer chromatography
(c) Preparation and separation of 2,4-dinitrophenylhydrazones of acetone / 2-butanone using toluene : light petroleum (2:3 ratio)
(d) Separation of mixture of dyes

(ii) Paper Chromatography

Determination of R_f values and identification of organic compounds:
(a) Separation of mixture of amino acids
(b) Separation of mixture of D-galactose and D-fructose using n-butanol:acetic acid:water 4:5:1) ; Spray reagent: anilinehydrogenphthalate

(iii) Column Chromatography

Separation and identification of ortho and para nitro anilines

References :

1. A Text Book of Qualitative Organic Analysis, A I Vogel
2. A Text Book of Quantitative Organic Analysis, A I Vogel
3.Systematic experiments in Chemistry Arun Sethi, New Age International(P) Ltd.

Core Course 3F Mathematics

BSE VI.3A :GROUPS AND RINGS

Credits: 4 (3L+ 1T +0P) **Marks: 100**
Contact hrs per week: 5 **C1 + C2: 50**
Exam Duration: 2 hrs **C3: 50**

Objectives:
By the end of the semester the students will be able to develop understanding of the abstract concepts of groups and rings, and special classes of rings and to appreciate modern mathematical concepts.

COURSE CONTENT:
Unit I:
Groups, Examples, Properties and types, Sub-groups. Cyclic groups and properties, Cosets, Lagrange's theorem and its Consequences, Dihedral groups, Normal subgroups, Quotient groups.

Unit II:
Homomorphism and Isomorphism of groups, Kernel of a Homomorphism, , Fundamental theorem of Homomorphism, Cauchy's theorem for abelian groups, Permutation group, Alternating Group, Cayley's Theorem.

Unit III:
Rings, Integral Domains, Division Rings, Fields, Properties, Field of quotients. Ideals, Quotient rings Maximal, Prime and Principal ideals, Principal ideal ring, Divisibility in an Integral domain, Units and Associates.

Unit IV:
Homomorphism of a ring, Kernel, Isomorphism, Fundamental theorem of Homomorphism, Polynomial rings, Divisibility, Irreducible polynomials, Division Algorithm, Greatest Common Divisor, Euclidean Algorithm, Unique Factorisation Theorem, Eisenstein'sCriterion of irreducibility.

References :

1. Topics in Algebra by Herstein, Vikas.
2. A First Course in Abstract Algebra by Fraleigh, Addison-Wesley.
3. Modern Algebra by Vasishtha, Krishna Prakashan Media Pvt. Ltd.
4. Higher Engineering Mathematics by Kreyszig, Wiley
5. Contemporary Abstract Algebra by Joseph A. Gallian, Narosa Publishing House.
6. Basic Abstract Algebra, 2nd Edition by P.B.Bhattacharya, S K Jain and S R Nagpaul, Cambridge University Press.
7. Modern Algebra – An Introduction by Durban, 5th Edition, Wiley.
8. Algebra by Michael Artin, Prentice Hall of India Pvt. Ltd.
9. A Brief Survey of Modern Algebra by Birkhoff and Maclane, IBH.

Core Course 3 F : Zoology

BSE VI.3B :ANIMAL PHYSIOLOGY, ENDOCRINOLOGY AND IMMUNOLOGY

Credits: 4 (3L+ 0T +1P) **Marks: 100**
Contact hrs per week: 5 **C1 + C2: 50**
Exam Duration: 2 hrs **C3: 50**

Objectives:

- To enable students to comprehend the modern concepts of physiological aspects of animals including human being
- To comprehend chemical nature and role of biological molecules
- To understand the defense mechanism of body

COURSE CONTENT:

Unit I: Digestion, Circulation and Respiration

a) **Digestion**– Mechanical digestion, Physiology of digestion, role of enzymes and GI hormones. Absorption of carbohydrates, proteins, lipids, vitamins and minerals

b) Circulation: Composition of blood and physiology of blood clotting; Lymphatic system; origin, conduction and regulation of heart beat, heart beat and pulse, cardiac cycle, blood pressure, myocardial infarction .

c) **Respiration**– Mechanism of breathing (external respiration) in man; structure and function of haemoglobin; Transport of gases - oxygen transport, oxygen equilibrium curve, Bohr effect; Transport of carbon dioxide, chloride shift; Control and regulation of respiration

Unit II:Excretion, Nerve and Muscle Physiology

a) **Excretion**: Nitrogenous waste products – Ammonotelism, ureotelism, uricotelism; Ornithine cycle; outline structure of human kidney and nephron, physiology of urine formation, counter-current mechanism; micturation; dialysis

b) **Homeostasis**– Osmo–conformers and regulators in marine and freshwater animals; thermoregulation in animals – Poikilotherms, heterotherms and homeotherms, adaptive changes in animals

c) **Nervous Co-ordination**– Structure and types of neuron and synapses; Physiology of transmission of impulse across axons and synapses, neuroinhibiters and neurotransmitters (4)

d) **Muscle contraction**–Ultrastructure of striated muscle, Contractile and regulatory proteins, neuro-muscular junction, mechanism of skeletal muscle contraction

Unit III: Endocrinology

a) General organization of mammalian endocrine system

b) Pituitary, thyroid, parathyroid, adrenal and gonads – Structure and functions of their secretions, abnormalities, A brief account on hormonal control of human pregnancy

c) Hormones: properties, feed-back mechanism, classification, mode of action of hormones (steroid and peptides)

d) **Reproductive cycles**– Estrous cycle in cow and menstrual cycle

Unit IV: Immunology

Introduction to Immunology, Types of Immunity, Lymphoid organs, Cells of immune system; Overview of antigen, structure and types of antibody, antigen-antibody reaction; Immune responses – Humoral and cell–mediated immunities (2); Autoimmunity and hypersensitivity ; **AIDS** - Structure of HIV, mechanism of immune deficiency and preventive measures.

***References*:**

1. Animal Physiology by A. Maria Kuttikan& N. Arumugam – (Saras Publication, Nagercoil, Tamil Nadu).
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3. Animal Physiology by K.A. Goyal and K.V. Sastry – (Rastogi Publications, 2008).
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5. Animal Physiology by Arora M.P. (1989) – Himalaya Publishing House.
6. Textbook of Medical Physiology by Guyton A.C. & Hall J.E. (1996) – (W.B. Saunders & Co.).
7. General and Comparative Physiology by Hoar W.S. (1983) – (Prentice Hall Publication).
8. A textbook of Animal Physiology by Hurtkat P.C. & Mathur P.N. (1976) – (S. Chand & Co.).
9. Textbook of Animal Physiology by Nagabhushanam R. & Kodarkar M.S. (1978) – (IBH).
10. General Endocrinology by Turner C.D. & Gangara J.T. (1971) – (W.B. Saunders & Co.)
11. Immunology by Dulsi Fatima .

PRACTICALS

Exam Duration : 3 hrs **C3 : 50**

Objectives:

- To develop the skills on haematology
- To enable students to analyse urine samples biochemically;
- To demonstrate physiological experiments – respiration, heart beat and muscle contraction
- To understand the anatomical and histological aspects of endocrine organs

COURSE CONTENT*:*

1. Preparation of blood smears of Frog and man
2. Total count of RBC
3. Total count of WBC
4. Differential count of Leucocytes
5. Estimation of haemoglobin by Sahlis method
6. Human urine analysis for a) Nitrogenous substances, b) Normal inorganic constituents, c) Abnormal constituents – (i) glucose, (ii) protein, (iii) ketone bodies.
7. To set up simple experiments to find out the rate of respiration in terrestrial/aquatic animals like cockroach, fish or rat.
8. Study of stained slides of mammals –

T.S. of a) Stomach b) Intestine c) Kidney d) Liver e) Pituitary, f) Adrenal gland, g) Thyroid, h) Testis, i) Ovary, j) Placenta, k) Pancreas

9. Demonstration of antigen-antibody reaction in gels
10. Effect of different Conc. NaCl on RBCs

PROFESSIONAL EDUCATION COURSES

BSE VI.4 :CRITICAL UNDERSTANDING OF ICT

Credits: 4 (3L+ 0T +1P) **Marks: 100**
Contact hrs per week: 5 **C1 + C2: 50**
Exam Duration: 2 hrs **C3: 50**

Objectives

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

- Appreciate the historical, current and future trends in ICT and its implications to education
- Explain the meaning of ICT and its application in Education
- Demonstrate an understanding of the computer hardware and software fundamentals
- Use various digital hardware and software for creating resources and providing learning experiences
- Use a word processor, spread sheet, drawing and presentation software skillfully and intelligently to produce various teaching learning resources for educational use
- Use internet technologies efficiently to access remote information, communicate and collaborate with others
- Model collaborative knowledge construction using various web 2.0 tools and technologies
- Design and develop technology integrated learning experiences using ICT tools
- Develop skills in using various e-learning and e-content tools and technologies
- Plan, develop, and use multimedia based learning content using open source authoring software
- Use ICT for designing learning experiences using innovative pedagogical approaches
- Explain the role of ICT in authentic and alternative assessment
- Understand the social, economic, security and ethical issues associated with the use of ICT
- Appreciate the scope of ICT for improving the personal productivity and professional competencies
- Appreciate the use ICT in improving educational administration
- Explain the emerging trends in information and communication technology

COURSE CONTENT:

Unit I: ICT and Education

Information and Communication Technology: meaning and nature. Learning theories and its implications for ICT integration in education. National ICT policy, curriculum and schemes

Historical account of the development of various educational media (audio, print, video, storage, display, projection)
Role of technology in emerging pedagogical practices. Visual literacy, media literacy, and new media literacy
Computer hardware fundamentals, computer network-LAN, WAN and Internet. Software – meaning and types: proprietary software and open source software, System software and application software
Emerging Trends in ICT and its educational applications: Augmented reality, e-books and rhizomatic learning, learning analytics, ubiquitous computing and mobile learning, Game based learning, cloud computing and software as service, 3D printing, and marker space

Unit II: E-content and e-resources
Educational applications of word processing, spreadsheet, presentation, and drawing tools – diagrams, concept maps, timelines, flow charts.
Reusable Learning Objects (RLO), e-content standards, authoring tools- open source and proprietary alternatives
Multimedia: meaning and types, multimedia tools-audio editing, video editing, screen casting, graphic editing, basics of animation, and creating interactive media. Evaluation of multimedia resources.
Open Educational Resources – Meaning and importance, various OER initiatives, creative common licensing
Locating internet resources – browsing, navigating, searching, selecting, evaluating, saving and bookmarking
Use of digital still and video camera, digital sound recorder, scanner, printer, interactive white board, visualizer, and multimedia projector for creating and using multimedia resources

Unit III: ICT and Pedagogy
Techno pedagogical content knowledge (TPCK). Approaches to integrating ICT in teaching and learning
Web 2.0 tools for creating, sharing, collaborating, and networking: Social networking, social book marking, blog, wiki, instant messaging, online forums/discussion groups and chats, and media streaming.
E-learning: concept, types, characteristics, e-learning tools and technologies, Learning Management Systems (LMS)
Subject specific ICT tools for creating and facilitating learning. Designing technology integrated authentic learning designs and experiences
ICI integrated Unit plan – Web 2.0 for creating constructivist learning environment
Technology for pedagogical innovations: web quest, PBL, virtual tours, MOOC, flipped classroom
Assistive technology for special needs and inclusion: tools and processes, ICT and Universal design for Learning (UDL)

Unit IV: ICT for Assessment, Management, and professional development
ICT and Assessment**:** e-portfolio, electronic rubrics, online and offline assessment tools – rubrics, survey tools, puzzle makers, test generators, reflective journal, and question bank.
Use of web 2.0 tools for assessment,
ICT for professional development - tools and opportunities: electronic teaching portfolio, web 2.0 technologies, technology and design based research, ICT for self-directed professional development, web conferencing, role of OER and MOOCs

ICT for personal management: email, task, events, diary, networking. ICT for educational administration: scheduling, record keeping, student information, electronic grade book, connecting with parents and community, school management systems.
Managing the ICT infrastructure: software installation, troubleshooting of hardware, seeking and providing help, storage and backup, updating and upgrading software

Computer security: privacy, hacking, virus, spy ware, misuse, abuse, antivirus, firewall, and safe practices, fare use and piracy

Sessional Work

1. Hands on experience in setting up a desktop PC and working with various input devices, output devices, storage devices, and display devices
2. Using word processor, spread sheet, drawing and presentation software to produce various teaching learning resources and sharing it online
3. Locating internet resources – navigating, searching, selecting, saving, evaluating(use standard internet evaluation criteria), and bookmarking using social bookmarking
4. Creating digital concept maps, flow charts, timelines, and other graphics for a particular content
5. Creating screen cast video and podcast of a lesson
6. Shooting, editing, and sharing of videos segment on any educational topic
7. Creating account in YouTube/slide share and sharing the video/presentation. View and comment on others contributions
8. Creating account in wikispace/wikipedia/mediawiki and adding/editing content
9. Developing an educational blog in www.blogger.com, www.wordpress.com, or www.edublog.com
10. LMS experience- hands on various features of LMS – the ICT course may be provided through LMS
11. Enrolling and completing some MOOC courses of interest
12. Creating resources for flipped classroom and Practicing flipped learning in school during internship
13. Evaluating OER resources. Creating and sharing OER materials- may be in NROER
14. Developing technology integrated unit/lesson plan and trying out this in the school during internship
15. Hands on experience on subject specific software tools like Geogebra, PhET
16. Developing a multimedia e-content for a topic using eXe Learning
17. Field visit to the Edusat center and take part in teleconferencing
18. Planning and creating digital rubrics for any topic and create an e-portfolio
19. Organize web conferencing using Skype or any other tools
20. Review of ICT labs (plans and equipments/resources) in school from internet
21. Interview of computer hardware engineer/ICT specialist regarding Hardware planning, evaluation, maintenance and up gradation
22. Readings on emerging ICT trends in education
23. Review of national ICT policy and curriculum
24. Using FOSS tools for timetabling, grade sheet

References:

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20. Manojkunar Dash(2010). ICT in teacher development. Neelkamal Publications: New Delhi.
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22. M. D. Roblyer, Aaron H. Doering (2012). Integrating Educational Technology into Teaching (6th Edition)
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25. Ronghuai Huang and Kinshuk(2014). ICT in Education in Global Context: Emerging Trends Report 2013-2014 (Lecture Notes in Educational Technology). Springer: New York.
26. Rosemary Papa.(2010).Technology Leadership for School Improvement. Sage:New Delhi.

27. Sarkar, S.K. & Gupta, A.K.(1998). Elements of Computer Science. S.Chand& Company: New Delhi
28. Semenov, Alexy (2005). Information and Communication Technologies in Schools. A handbook for Teachers. UNESCO
29. ShalinHai-Jew. (2012). Open-Source Technologies for Maximizing the Creation, Deployment, and Use of Digital Resources and Information. Information Science Reference:USA
30. Theodore Lee(2008). Professional Development of ICT Integration for Teachers.VDM Verlag : Germany.
31. W.J. Pelgrum and N.Law(2003). ICT in Education around the world-Trends ,Problems and Prospects . UNESCO : Paris.
32. Viva Lachs (2000). Making Multimedia in the Classroom-A Teacher's Guide. Routlegde Farmer :London.

BSE VI.5:PEDAGOGY OF PHYSICAL SCIENCE 2

Credits: 4 (2L+ 2T +0P) **Marks: 100**
Contact hrs per week: 6 **C1 + C2: 50**
Exam Duration: 2 hrs **C3: 50**

Objectives

- Enable the students to write the unit plans and lesson plan as per the norms of NCF 2005.
- Applying the different teaching methods based on a constructivist point of view.
- Enable the students to observe the lesson systematically.
- Selecting the learning resource and effective use of the same.
- Using of ICT in physical science teaching and learning.
- Explore various assessment strategies for evaluating learning in Physical science.
- Explore various professional development opportunities.
- Plan and conduct action research in secondary schools.
- Identify various teaching- learning resources.
- Develop skills of facilitation as they teach in simulated situations.
- Reflecting the methods in the class.

Unit I: Learning Resources in Physical Science

Print resources: Textbook as a learning resource, criteria for evaluation of a textbook, handbooks, teacher resource books, laboratory manuals, science journals and magazines, encyclopedia, newspaper.
Dale's cone of experience and its use in teaching- learning.
Developing and using resources such as charts, models, science kits, posters, science parks.
Science laboratories: designing, management, and safe practices.
Making low-cost equipment from locally available resources, using the immediate environment and the community resources for teaching of physical science.
Exploring and using digital resources: websites, videos, games, simulations, mobile apps, presentations, OER, interactive multimedia resources, e-books, podcasts, digital concept maps, and digital graphics.

ICT integration in physical science teaching: different forms of ICT and its application in science education.

Unit II: Need and Importance of Assessment for Learning Physical Science

Learning standards in science, process and product assessment in Physical Sciences, importance of metacognition and reflection in assessment, importance feedback in facilitating learning.

Meaning of the terms test, examination, measurement, assessment and evaluation in proper context, Continuous and Comprehensive Evaluation (CCE) and its features.

Assessment and evaluation as intertwined process of classroom experiences performance based assessment, planning assessment framework, Learning Indicators (Lis) and its types, developing LIs for activity, presentation, group work, assignments etc.

Recording and reporting of learning evidences – measurement of students' achievement – marks and grading.

Unit III: Tools and Techniques Assessment for Learning Physical Science

Tools and technique of assessment-- assessment of written and oral work, project work, laboratory work, field trips, journal writing, concept map; assessment of learners with special needs.

Use of observation, questioning, concept mapping, rating scales, worksheets, reflective journals/diary, peer and self-assessment in physical science.

Use of rubrics, and portfolio assessment in Physical Science, diagnosing learning difficulties and misconception in Physical Science.

Use of ICT in assessment.

Constructing different types test items in Physical Science at different levels of taxonomy, preparation of blue print/table of specification and constructing unit test.

Unit IV: Professional development of Physical Science teachers

Professional competencies of a physical science teacher.

Need for updating content and pedagogical competencies, pre-service and in-service courses and initiatives, agencies to nurture the best teachers, NCERT activities for teachers.

Participation in science fairs, exhibitions, and science club activities

Planning contextual activities- celebration of science day, birthdays of great physicists and chemists, seminars, conferences, online sharing, distance learning, membership to organisations- NSTA, IPA, IAPT, Indian Chemical Society, INSC. NCERT publications and journals

Meaning, nature, scope, designing and implementing innovative approaches to teaching science.

Teacher as a Researcher: meaning of research and its importance, action research versus research, selecting the problem for action research, format of research plan, action research in physical sciences, steps in action research, examples of action research from the primary, secondary, and higher secondary levels.

Sessional Activities:

(Any TEN from the following)

- Design and development of unit test.

- Developing rubrics for laboratory work, assignment, field trip, project etc.
- Facilitating the development of digital portfolio by a couple of school students.
- Designing and implementing science lab experiments.

- Text book analysis for content organization/ validness of curriculum mentioned in NCF 2005.
- Analysis of process skills and planning lessons for developing process skills.
- Identifying, selecting, and evaluating various media for chosen unit.
- Case studies of successful teacher leaders.
- Presentation and discussion on sample action research studies.
- Planning and conducting an action research.
- Debates on various ethical issues.
- Visit to a special school, observation of inclusion strategies in regular classroom.
- Development of teaching portfolio.
- Analysis of teacher competency framework of various organization.
- Study of a science professional organization.
- Review of an action research article/teaching of Physical science related research article.
- Organizing a science exhibition.
- Formation of a science club and conducting various activities.
- School visit to study the CCE practice.
- Conducting field trips to science museum, science park, botanical garden.
- Writing unit plan for at least 2 units of secondary science.
- Writing lesson plan for at least 2 topics of secondary science.
- Classroom Experience 2: Classroom Observation for studying teacher's facilitation skills and how student work is distributed (with emphasis on pedagogical aspects-strategies/materials used).
- Preparing and demonstrating low cost/improvised teaching aids based on Class VII, VIII and IX class Physical Science.
- Simulated teaching of class VII-X topics.
- Developing and analysing a Physical Science achievement test.
- Develop an assessment rubric in Physical Science.
- Visit to a Science museum / Science park /Science teacher resource centres.
- Organize a seminar related to Science day. Developing an action research plan for teaching-learning Physical Science.

References:

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BSE VI.6A :PEDAGOGY OF MATHEMATICS 2

Credits: 4 (2L+ 2T +0P) **Marks: 100**
Contact hrs per week: 6 **C1 + C2: 50**
Exam Duration: 2 hrs **C3: 50**

Objectives:

On completion of the course the students will have

- understanding of nature of teaching proof and problem solving in mathematics
- ability to analyse the purposes of teaching algebra and geometry
- ability to select suitable tools for mathematical construction and measurements
- Appreciates the usefulness of mathematics in day today activity in various fields
- adopt different strategies to meet the diversified needs of learners and appreciates the availability of various learning resources in mathematics

- Decision making ability to use appropriate assessment tools for mathematical assessment

COURSE CONTENT:

Unit I : Teaching of Proof and Teaching of Problem-solving

Meaning and nature of Proof; kinds of proof- direct, proof by mathematical induction, proof by contradiction, proof by contrapositive, proof by cases, proof by counter examples ; planning and teaching of various theorems in mathematics (secondary level)

Problem-solving

Definition of problem, problem solving; Meaning and nature of Problem solving, strategies of problem solving- Means-ends analysis, backtracking, backward movement, heuristics; Polya's Problem solving steps; solving various mathematical problems

Unit II: Teaching of Algebra and Geometry

Introduction of basic ideas of algebra- variable, constant, coefficient, expression, equation; nature and purpose of teaching algebra; Contextualization of practical situation into algebraic expressions or equations(mathematization); solving various algebraic relations problems of secondary level.

Nature of geometry; purpose of teaching geometry; construction of different geometrical figures; Role of geometry in comprehending mathematics as whole; developing skills in selecting, drawing, using appropriate geometrical instruments and its utility in real life situation; scale drawing; topology and its application in mathematics.

Unit III: Meeting diverse needs of learners (Gifted and Slow learners) and Learning resources in mathematics

Gifted child in mathematics- their characteristics, identification and enrichment programmes slow learners in mathematics- their characteristics, identification and remedial measures; overcoming dyscalculia and dysgraphia problems in mathematics and their remediation.

Creation of **visual aids**-charts, models, graphs; usage of **graphical tools**- calculator, logo, cabri, geogebra, sketch pad, ready reckoners; selection and integration of tools in relation to content and learning environment; **Audio-visual aids**- animations, film shows; mathematics lab; mathematics club; e-resources and open and free software; **community resources**- library, museum, theatre, knowledgeable person or experts

Unit IV: Assessment of learning in mathematics

Selection of appropriate tools for formative and summative assessment; diagnosing the learning difficulties of learners (Error analysis- procedural errors, conceptual errors, computational errors) and providing remedial measures (Peer tutoring, direct instruction, mentoring); creation of rubric, portfolios, Criterion reference test, Norm referenced test based on set criteria; construction, administration, scoring, interpretation of a unit test and providing feedback to learners.

For all the Pedagogical transactions the following content knowledge (8^{th}, 9^{th} , 10^{th}, 11^{th}, and 12^{th} standard syllabus) to be made use of, and these can be revised as per the change in curriculum of respective state or changes in CBSE syllabus or in NCERT text books.

Arithmetic: Number system, Ratio and Proportion, Fractions, Commercial mathematics and Data handling, sets, Matrices

Algebra: Polynomials, Graphical representations of various equations, trigonometry,

Geometry: Lines and angles; Triangles and its related theorems; polygons; analytical geometry,

Differential calculus; Integration, Trigonometry; graph theory; computing using ICT.

Sessional work:

Selecting any one of the theorem and teaching it by adopting the strategies of teaching proof
Selecting any one kind of problem in mathematics and demonstrate its procedure of solving
Selecting a topic in algebra or in geometry and teaching it using appropriate learning resources
Construction of unit test (administration, scoring, statistical analysis and reporting) on a selected unit
Analysing the errors committed by learners at secondary level, in regular test (FA1or FA2) and analysing its causes and suggesting various remedial measures for it

References:

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BSE VI.6B :PEDAGOGY OF BIOLOGICAL SCIENCE 2

Credits: 4 (2L+ 2T +0P) **Marks: 100**
Contact hrs per week: 6 **C1 + C2: 50**
Exam Duration: 2 hrs **C3: 50**

Objectives

- Explain various methods and strategies of biology teaching
- Use various approaches to facilitate learning
- Integrate ICT in biology teaching
- Develop and use various learning resources in biology teaching
- Construct unit test in biology
- Explore various assessment strategies for evaluating learning in biology
- Explore various professional development opportunities
- Plan and conduct action research in secondary schools

COURSE CONTENT:

Unit I: Methods and Strategies for Facilitating Learning:

Teaching concepts and generalisations, inductive approaches, using advance organisers, problem solving approach, investigatory approach, project method, cooperative learning method

Facilitating learning: questioning-techniques and strategies, higher order and metacognitive questioning, scaffolding-techniques and strategies, discussions/dialogue

Strategies for creating an inclusive biology classroom

Laboratory approaches- inductive, deductive, verification and problem solving

Using field trips, projects, quiz, exhibition, science fair, science clubs/nature clubs/eco clubs, study tours, observation of environment related days in learning biology

ICT integration in biology teaching: use of wiki, blog, social networking, social book marking, webquest, virtual field trips, e-learning, flipped learning and MOOC in biology learning

Unit II: Learning Resources in Biology Teaching

Textbook as a learning resource, Handbooks, Teacher Resource books, laboratory manuals, Encyclopaedia, newspaper

Developing and using Charts, models, science kits posters, worksheets, museum, botanical garden, national parks, aquaria, and herbarium

Science laboratories: designing, management, and safe practices

Making low-cost equipment from locally available resources, using the immediate environment and the community resources for teaching of biological science

Developing and using digital resources: websites, videos, games, simulations, mobile apps, presentations, OER, interactive multimedia resources, e-books, podcasts, digital concept maps, and digital graphics

Unit III: Assessment in Science

Learning standards in Science, process and product assessment in biology, importance of metacognition and reflection in assessment, importance feedback in facilitating learning

Use of observation, questioning, concept mapping, rating scales, worksheets, reflective journals/diary, peer and self-assessment in biology

Use of rubrics, and portfolio assessment in biology

Diagnosing learning difficulties and misconception in biology
Techniques of assessing laboratory and project work
Use of ICT in assessment
Strategies for continuous and comprehensive evaluation in biology
Constructing different types test items in biology at different levels of taxonomy, preparation of blue print/table of specification and constructing unit test.

Unit IV: Professional development
Professional competencies of a biology teacher need for updating content and pedagogical competencies, teacher as a lifelong learner
Various in-service courses and agencies available for biology teachers to develop their professional competencies
Professional development activities: seminars, conferences, online and offline courses, teacher exchange, competitions, publications, development of teaching portfolio
Role of professional associations in professional development
Developing professional competencies in dealing with gender issues, equity and inclusion, ethical issues, environmental issues, human health and population
Action research, reflection and evidence based practice in science teaching
Importance of self-directed professional development
Teacher leadership: using transformative pedagogical practices

Sessional Activities

- enrolling and completing a mooc related to science
- converting one unit of secondary biology in to mooc format
- developing and trying out flipped learning in school
- design and development of unit test
- Developing rubrics for laboratory work, assignment, field trip, project etc.
- Facilitating the development of digital portfolio by a couple of school students
- Designing and implementing a science lab experiments
- Analysis of process skills and planning lessons for developing process skills
- Development of concept map for a given unit/facilitating concept mapping among school students
- Celebration of science days
- Developing graphics for a particular units
- Identifying, evaluating and selecting various media for chosen unit
- Case studies of successful teacher leaders
- Presentation and discussion on sample action research studies
- Planning and conducting an action research
- Debates on various ethical issues
- Visit to a special school, observation of inclusion strategies in regular classroom
- Development of teaching portfolio
- Analysis of teacher competency framework of various organization
- Study of a science professional organization
- Developing a self-directed professional development plan
- Review of an action research article/teaching of biological science related research article
- Organizing a science exhibition
- Formation of a science club and conducting various activities
- School visit to study the CCE practice

- Conducting field trips to science musem, science park, botanical garden
- Writing reflective journal

References

1. Amanda Berry, et.al. (2015). Re-examining Pedagogical Content Knowledge in Science Education (Teaching and Learning in Science Series). Routledge: New York
2. Carin A and B R Sund (1964), Teaching Science through Discovery, Charles E. Merrill Books Inc.,
3. David Sang & Robert Frost (2005). Teaching Secondary Science Using Ict
4. DK Publishing (2013). Timelines of Science
5. Don P. Kauchak,& Paul D. Eggen (2013). Introduction to Teaching: Becoming a Professional (5th Edition)
6. Ernst Mayr (1985).The Growth of Biological Thought: Diversity, Evolution, and Inheritance
7. J. A. Cover, Martin Curd, & Christopher Pincock (2012).Philosophy of Science: The Central Issues (Second Edition)
8. Jeffrey Bennett (2014). On Teaching Science: Principles and Strategies That Every Educator Should Know. Big Kid Science:Boulder,CO
9. John Gribbin.(2004).The Scientists: A History of Science Told Through the Lives of Its Greatest Inventors. Random House: New York
10. Judith Bennett (2003) Teaching and Learning Science : A guide to recent research and its applications, Continuum, London.
11. Lois N. Magner (2002).A History of the Life Sciences, Revised and Expanded
12. Michael F. Fleming (2002).Biology Teacher's Survival Guide: Tips, Techniques & Materials for Success in the Classroom
13. Michael Reiss (2012). Teaching Secondary Biology (Ase Science Practice). HodderEducation:London
14. Nathan S Washton (1967). Teaching Science Creatively, Saunders Company, London.
15. National Curriculum Framework 2005, NCERT, New Delhi.
16. Novak D J and D Bob Gowin (1984) Learning how to learn, Press Syndicate of the University of Cambridge, Ohio.111
17. BSCS (2009)The Biology Teacher's Handbook, 4th Edition
18. Ralph Martin, Colleen Sexton, Kay Wagner, Jack Gerlovich (2000) Science for All Children: Methods for Constructing Understanding, Allyn and Bacon, London.
19. Robert J. Marzano.(2007). The Art and Science of Teaching: A Comprehensive Framework for Effective Instruction (Professional Development). ASCD:Alexandria, VA
20. Rodger W. Bybee, et.al. (2007). Teaching Secondary School Science: Strategies for Developing Scientific Literacy (9th Edition)
21. Sally McKeown (2012). Brilliant Ideas for Using ICT in the Inclusive Classroom. Routledge:New York
22. Samir Okasha (2002).Philosophy of Science: A Very Short Introduction. Oxford UnversityPress:Oxford
23. Sandra K Abell,& Mark J Volkmann. (2006). Seamless Assessment in Science: A Guide for Elementary and Middle School Teachers
24. Stephen P. Gordon. (2003). Professional Development for School Improvement: Empowering Learning Communities
25. Steve Alsop, Keith Hicks (2007). Teaching Science : A Handbook for Primary and Secondary School Teachers, Kogan Page, New Delhi.

26. Susan Loucks Horsley et.al. (2009). Designing Professional Development for Teachers of Science and Mathematics. Sage: New Delhi
27. Thomas S. Kuhn (2012). The Structure of Scientific Revolutions: 50th Anniversary Edition. University of Chicago Press:Chicago
28. West Ed, & WGBH Boston (2003).Teachers as Learners: A Multimedia Kit for Professional Development in Science and Mathematics

SEVENTH SEMESTER

DISCIPLINE SPECIFIC ELECTIVE

DSE 1 A : Physics

BSE VII.1A :NUCLEAR AND PARTICLE PHYSICS

Credits: 3 (1L + 1T +1P) **Marks: 100**
Contact hrs per week: 5 **C1 + C2: 50**
Exam Duration: 2 hrs **C3: 50**

Objectives:
To enable students to apply the basic knowledge of classical and quantum mechanics at the atomic and molecular level.

COURSE CONTENT:

Unit I: Atomic Nucleus
Nuclear structure, Failure of proton-electron hypothesis– neutron, its discovery and properties, Proton-neutron hypothesis, Constituents of nucleus and their Intrinsic properties, Basic properties of nucleus– charge, spin, radii, mass, magnetic moment. Nuclear forces and their characteristics. Yukawa's Theory (Qualitative), Packing fraction and binding energy, average binding energy and its variation with mass number, main features of binding energy versus mass number curve, Nuclear stability, Segre chart.

Unit II: Nuclear Models

Nuclear Models– Liquid drop model approach, semi empirical mass formula and significance of various terms, condition of nuclear stability. Two nucleon separation energies, Fermi gas model (degenerate fermion gas, nuclear symmetry potential in Fermi gas), evidence for nuclear shell structure, nuclear magic numbers, basic assumption of shell model, concept of mean field, residual interaction, concept of nuclear force.

Unit III: Radioactivity

Review: Radioactive decay – Half life, mean life, Activity-decay constant. Radioactive displacement laws. Theory of α decay, α-emission, Gamow factor. Geiger-Nuttal law. Beta decay, energy kinematics for Beta decay, positron emission Beta spectra. Neutrino hypothesis, K electron capture, internal conversion, Gamma decay, pair production, successive disintegration, units of radio activity, radioactive dating, uncontrolled and controlled chain reactions, nuclear fission and fusion. Energy liberated in nuclear fission, energy production in stars, Nuclear reactors.

Unit IV:

Particle Accelerators and Detectors: Cockroft– Walton voltage multiplier, LINAC, Cyclotron, Betatron.
Nuclear Detectors: GM counter, scintillation detector, bubble chamber, principle of semiconductor detector.
Particle Physics: Particles and anti-particles, Classification of particles, Symmetries and Conservation Laws, Qualitative introduction to quarks, Structure of hadrons.

References:

1. I. Kaplan, Nuclear Physics, Narosa, 2002.
2. Kenneth S. Krane, Introductory nuclear Physics, Wiley India Pvt. Ltd., 2008.
3. Bernard L. Cohen, Concepts of nuclear physics, Tata McGraw Hill, 1998.
4. Subramanyam and Brijlal, Atomic and Nuclear Physics, S. Chand & Company Ltd. 2013.
5. R.A. Dunlap, Introduction to the physics of nuclei & particles, Thomson Asia, 2004.
6. Arthur Beiser, Perspectives of Modern Physics, McGraw-Hill Inc.,US; International edition.
7. D. Griffith, Introduction to Elementary Particles, John Wiley & Sons, 2008.

PRACTICALS

Exam Duration : 3 hrs **C3 : 50**

Objectives:

- To provide training in the broad methodology of science through investigatory type and open-ended laboratory exercises.
- To validate the theoretical basis of the experiments.

COURSE CONTENT:

(A minimum of TEN experiments to be selected from the following)

1. GM Counter characteristics.
2. GM Counter– Absorption coefficient.
3. Determination of Half life of Co-60.
4. Simulation experiment on radioactive decay.
5. Verification of inverse square law for beta rays.
6. Verification of inverse square law for gamma rays.
7. Rutherford model– Simulation technique.
8. Ionization potential of Xenon.
9. Measurement of Mercury spectrum wavelength.
10. Spectrometer-Quartz prism-Refractive indices of quartz for the ordinary and extra-ordinary rays.
11. LCR Parallel resonance
12. LCR Series resonance.
13. FET characteristics.
14. Hartley oscillator.

References:

1. B.L.Flint & H.T.Worsnop, Advanced Practical Physics for students, Asia Publishing House, 1971.
2. E Armitage, Practical Physics, John Murray.
3. PSSC Physics Laboratory Guide.
4. S.Panigrahi & B.Mallick, Engineering Practical Physics, Cengage Learning India Pvt. Ltd., 2015
5. Indu Prakash and Ramakrishna, A Text Book of Practical Physics, 11th Edition, Kitab Mahal, New Delhi, 2011.
6. Jerry D Wilson and Cecilia A. Hernández-Hall Physics Laboratory Experiments7th Edition, Cengage Learning, 2009.
7. S.Panigrahi & B.Mallick, Engineering Practical Physics, Cengage Learning India Pvt. Ltd., 2015.
8. Michael Nelson and Jon M. Ogborn, Advanced level Physics Practicals, 4th Edition, reprinted, Heinemann Educational Publishers, 1985.

DSE 1 A : Botany

BSE VII.1B :CELL BIOLOGY AND GENETICS

Credits: 3 (1L + 1T +1P) **Marks: 100**
Contact hrs per week: 5 **C1 + C2: 50**
Exam Duration: 2 hrs **C3: 50**

Objectives:

- To understand the structural complexity of eukoryotic cell;
- To understand the functioning of cell organelles;
- To acquaint students with the structure, significance of nucleus and chromosomes;
- To review Mendelian inheritance in the light of gene interactions.

COURSE CONTENT:

CELL BIOLOGY

Unit I :

a) Principles of microscopy – Light, flourescent, phase contrast, UV and electron microscope.
b) Ultrastructure of prokaryotic and eukaryotic cells.
c) Cell- organelles : Ultrastructure and functions of cell wall, plasma membrane, Golgi complex, Endoplasmic reticulum, Mitochondrion.

Unit II :

a) Ultrastructure and functions of chloroplast, ribosome, lysosome and microbodies.
b) Nucleus – Ultrastructure of eukaryotic nucleus.
c) Chromosomes – Brief account of morphology and organization of prokaryotic and eukaryotic chromosome; Nucleosome model, concept of karyotype and idiogram (brief).

Unit III:
a) Chromosomal alterations : (i) Structural variations – Deletion, Duplication, Translocation and Inversion. (ii) Numerical Variations – Aneuploidy and euploidy.
b) Cell Division : Cell-cycle, events of cell division, karyokinesis, cytokinesis, cell-cycle; Mitosis, Meiosis and their significance.

Unit IV:
GENETICS
a) Mendelism – Review of Mendel's laws of inheritance, solving problems related to Mendel's laws.
b) Inheritance of genes : Incomplete dominance, complementary gene action (flower colour in sweet pea), supplementary gene action (coat colour in mice), epistasis (fruit colour in summer squash), multiple factor inheritance (ear size in maize).
c) Sex determination in plants – Melandrium.
d) Cytoplasmic inheritance – plastid inheritance in Mirabilis, cytoplasmic male sterility in maize.
e) Genetic variations : Mutations – spontaneous and induced, transposable genetic elements.

References:

1. Snustad D.P. and M.J.Simmons 2000, Principles of Genetics, John Wiley & Sons, Inc. USA.
2. Gupta, P.K.1999, A Textbook of Cell and Molecular Biology, Rastogi Publications, Meerut.
3. Wolfe,S.L.1993, Molecular and Cell Biology, Wadsworth Publishing Co., California, USA.
4. Harris, N. and K.J.Oparka, 1994, Plant Cell Biology : A Practical Approach, IRL Press, Oxford Univ.Press, Oxford, UK.
5. Singh, S.P. and B.S.Tomar, 2006, Cell Biology, Rastogi Publications, Meerut.
6. Gupta, P.K. 2005, Elements of Genetics, Rastogi Publications, Meerut.
7. Gardner, A.,1990, Principles of Genetics (6th Ed.), John Wiley & Sons Inc., USA.
8. Gupta P.K. 2000, Cytology, Genetics and Evolution, Rastogi Publications, Meerut.
9. Atherly, A.G. J.R.Girton and J.F.MacDonald, 1999, The Science of Genetics, Saunders College Publishing, Fortworth, USA.
10. Russel,P.J. 1998, Genetics, The Benjamin/Cummings Publishing Co. Inc., USA.
11. Gunning, B.E.S. and M.W.Steer 1999, Plant Cell Biology, Structure and Function, Jones & Bartlett Publishers, Boston, Massachusettes.

PRACTICALS

Exam Duration : 3 hrs **C3 : 50**

Objectives :
- To develop skills of staining cells and observing cell organelles.
- To prepare temporary and permanent cytological preparations of suitable plant materials to study mitosis and meiosis.
- To verify Mendelian laws of inheritance.

COURSE CONTENT :

1. Comparative study of cell structure in onion cells, Hydrilla and Chara/Spirogyra. Study of cyclosis in Tradescantia staminal cells.
2. Study of plastids to examine pigment distribution in plants (e.g. Cassia, Lycopersicon and Capsicum)
3. Examination of electron micrographs of virus, bacteria, Cyanobacteria. and eukaryotic cells with special reference to organelles;
4. Study of various stages of mitosis and meiosis by preparing slides of suitable plant materials (onion root tips and onion flower buds).
5. Working out the laws of inheritance using seeds/ beads.
6. Working out genetic problems related to Mendelian laws of inheritance and interaction of genes.

DSE 2AChemistry

BSE VII.2 :ELECTROCHEMISTRY AND PHOTOCHEMISTRY

Credits: 3 (1L + 1T +1P) **Marks: 100**
Contact hrs per week: 5 **C1 + C2: 50**
Exam Duration: 2 hrs **C3: 50**

Objectives:

- Explain the nature of Electrolytic conduction involving theories of electrolytes.
- Understand the processes that occur at electrodes and in electrolytes and to apply emf methods to study different types of reactions.
- To have knowledge about the commercial cells and their applications
- To obtain information about the basic photophysical and photochemical processes

COURSE CONTENT:

Unit I: Electrochemistry – I

To study the behaviour and reactions of ions in a variety of environments through the laws that govern them. Electrical transport – conduction in metals and in electrolyte solutions, specific conductance and equivalent conductance, measurement of equivalent conductance, variation of equivalent and specific conductance with dilution.

Migration of ions Kohlrausch law, Arrhenius theory of electrolyte dissociation and its limitations, weak and strong electrolytes, Ostwald's dilution law, its uses and limitations. Debye-Huckel-Onsager's equation for strong electrolytes (elementary treatment only). Transport number, definition and determination by Hittorf method and moving boundary method.

Applications of conductivity measurements : Determination of degree of dissociation, determination of K_a of acids, determination of solubility product of a sparingly soluble salt, conductometric titrations.

Unit II: Electrochemistry – II

Types of reversible electrodes – gas-metal ion, metal-metal ion, metal-metal insoluble salt, Amalgam and redox electrodes. Electrode reactions, Nernst equation, derivation of cell E.M.F. and single electrode potential, standard hydrogen electrode-reference electrodes– standard electrode potential, sign conventions, electrochemical series and its significance.

To draw up a scheme for discussing the equilibrium position for an ionic reaction in terms of the electrode potential. Electrolytic and Galvanic cells–reversible and irreversible cells, conventional representation of electrochemical cells.

EMF of a cell and its measurements. Computation of cell EMF, Calculation of thermodynamic quantities of cell reactions (ΔG, ΔH and K), Chemical cells with and without transport.

Unit III : Electrochemistry – III

Concentration cell with and without transport, liquid junction potential, application of concentration cells, valency of ions, solubility product and activity coefficient, potentiometric titrations.

Definition of pH and pK_a determination of pH using hydrogen, quinhydrone and glass electrodes, by potentiometric methods, polarization, over potential and hydrogen over voltage Power storage, Lead Battery, Ni-Cd cells, Fuel Cells, Hydrogen–Oxygen cell. Thermodynamic and Kinetic basis of corrosion, methods of inhibition of corrosion

Unit IV : Photochemistry

Discussing the Interaction of radiation with matter, difference between thermal and photochemical processes. Laws of photochemistry: Grothus – Drapper law, Stark – Einstein law, Jablonski diagram showing various processes occurring in the excited state, qualitative description of fluorescence, phosphorescence, non-radioactive processes (internal conversion, intersystem crossing), quantum yield, photosensitized reactions – energy transfer processes (simple examples), Chemiluminescence.

References :

1. Photochemistry Gurudeep Raj Goel Publishing House
2. Principles of Physical Chemistry Puri, Sharma, Pathania 47th Edition Vishal Publishing Co.
3. Elements of Elecrochemistry by Samuel Glasstone and Lewis
4. Principles of Physical chemistry -Marron and Prutton

PRACTICAL

Exam Duration : 3 hrs **C3 : 50**

Objectives:

- To study the elecrical behaviour of weak and strong electrolytes
- Quantitative estimation of electrolytes by conductometric and potentiometric titration

COURSE CONTENT:

1. To determine the equivalent conductance of a strong electrolyte at several concentrations and verify Onsager's equation.
2. Conductometric titration of a strong acid Vs. strong base, strong base Vs. weak acid, strong base Vs mixture of acids (strong and weak) to determine the concentration of acids in a given solution and in mixture.
3. To determine the concentration of the given acid solution and concentration of acids in a mixture by potentiometric titration using sodium hydroxide solution.
4. Determination of Pka value of a weak acid by potentiometry.
5. Determination of the dissociation constant of a weak acid by conductometry
6. To determine the equivalent conductance of a weak electrolyto at different concentrations and verify Ostwald's dilution law. Also to find out the dissociation constant of a weak electrolyte.
7. To determine the solubility and solubility constant of a weak electrolyte conductometrically.
8. To find the composition of the complex formed between iron(III) and salicylic acid by Job's method.
9. To find out the amount of copper sulphate in the given solution by titrating with standard alkali by conductometry.
10. To determine the amount of FAS in the given solution by potentiometric titration with standard potassium dichromate and potassium permanganate solutions.
11. Estimation of Silver nitrate by potentiometric titration with standard potassium chloride solution.

References :

1.Systematic experimental in chemistry Arun Sethi New Age International (P) Ltd New Delhi.

DSE 3AMathematics

BSE VII.3A :LINEAR ALGEBRA

Credits: 3 (1L + 2T +0P) **Marks: 100**
Contact hrs per week: 5 **C1 + C2: 50**
Exam Duration: 2 hrs **C3: 50**

Objectives:

To enable the students to understand and apply the concepts of linear algebra in solving appropriate problems.

COURSE CONTENT:

Unit I:

Vector spaces, Subspaces, Linear Combinations, Linear span, Linear dependence and Linear independence of vectors, Basis and Dimension, Finite dimensional vector space – some properties. Quotient spaces, Homomorphisms and Isomorphisms of vector spaces, Direct sums.

Unit II:
Inner product spaces, Euclidean vector spaces, Distance, Length, Properties, Cauchy-Schwarz inequality, Orthogonal and orthonormal vectors, Gram Schmidt Orthogonalisation Process, Orthogonal complement.

Unit III:
Matrices of Linear maps, Change of basis and the effect of associated matrices, Kernel and Image of a linear transformation, Rank and Nullity theorems.

Unit IV :
Singular and non-singular linear transformations, Elementary matrices and transformations, Similarity, Eigen values and Eigen vectors, Diagonalisation, Characteristic polynomial, Cayley - Hamilton Theorem, Minimal Polynomial.

References :

1. Theory and Problems of Linear Algebra, Saymour Lipschitz, Schaum Outline Series.
2. Introduction to Linear Algebra by Stewart, Van Nostrand Co. Ltd.
3. Modern Algebra, Vol.II, by Narayanan and Manicavachagam Pillay, S. Vishwanathan and Co.
4. Brief Survey of Modern Algebra, Brikhoff and Maclane, IBH
5. Linear Algebra by Serge Lang, Addison Wesley Publishing company Inc.
6. Vector Algebra, Shantinarayan and P K Mittal, S Chand and Co. Ltd.
7. Linear Algebra by Larry Smith, Spinger Verlag.
8. Elementary Linear Algebra with Applications, Keith Nicholson, PWS – Kent Publishing Company
9. Linear Algebra, Surjith Sinth, Vikas Publishing House Pvt. Ltd.
10. Modern Algebra by Vasishta, Krishna Prakashan Media Ltd.
11. Linear algebra – a geometric approach by Kumaresan. S

DSE 3A Zoology
BSE VII.3B :CELL BIOLOGY, GENETICS AND EVOLUTION

Credits: 3 (1L + 1T +1P) **Marks: 100**
Contact hrs per week: 5 **C1 + C2: 50**
Exam Duration: 2 hrs **C3: 50**

OBJECTIVES:

- To comprehend the modern concepts and applied aspects of cell biology
- To enable students to comprehend the modern concepts of genetics
- To create awareness regarding hereditary diseases
- To comprehend the origin of life and theories of evolution

COURSE CONTENT:

Unit I: CELL AND CELL ORGANELLES – I

Prokaryotic and Eukaryotic cells: Plant and animal cell differences, Diversity of cell size and shape; Cell theory; Protoplasm and its properties; Cytoskeleton – Microtubules, microfilament and intermediate filaments

Cell membrane – Ultrastructure, fluid mosaic model and functions; Structures and functions of Endoplasmic Reticulum, Mitochondria, Golgi complex, Ribosomes and Lyssosomes

Unit II: CELL ORGANELLES – II and GENETICS – I

a) **Nucleus** – structure (nuclear membranes, nucleoplasm and nucleolus)
b) **Chromosomes** – Structure of eukaryotic chromosome (nucleosome model), giant chromosome – Polytene and lampbrush chromosomes; Mitosis and Meiosis, Cell-cycle and regulation
c) **Cancer:** Characteristics of cancer cells, types and carcinogens
d) **Inheritance**: Mendel's Laws, Monohybrid cross, dihybrid cross, test cross
e) **Deviation of Mendelism**: Incomplete dominance and codominance
f) **Interaction of genes**: Epistasis – (dominant and recessive) Complimentary genes; multiple gene–inheritance of skin colour in man; Multiple alleles – inheritance of coat colour in rabbit, and ABO blood groups in man
g) **Linkage and crossing over**: Types, process and significances

Unit III: GENETICS - II

a) Sex determination: Genetically controlled mechanism (sex chromosome mechanism, genic balance mechanism, haplo-diploidy mechanism); sex determination in humans; Barr body, Structure of Y chromosome and sex determining genes in human; Sex determination in *Melandrium*.
b) Sex linked inheritance: Sex linked inheritance in *Drosophila* (eye colour) and humans; sex limited and sex influenced characters
c) Cytoplasmic inheritance: (i) Kappa particles in *Paramecium* (ii)
d) Chromosomal aberrations: Structural and numerical aberration in human (Syndromes)
e) Inborn errors of metabolism in humans: Phenylketonuria and Galactosemia

UNIT IV: EVOLUTION

a) **Origin of Life:** Theories on origin of life, Urey Miller's experiment
b) **Theories of Evolution:** Lamarckism and Darwinism, Neo-Lamarckism, de Vries theory of mutation and its significance in evolution; Hardy-Weinberg's Law, Genetic drift, Modern synthetic theory of evolution; Concept of species and speciation; brief account of micro-, macro- and mega-evolution, Evolution of man
c) **Survival strategies:** coloration and mimicry

References:

1. Cell and Molocular Biology by P.K. Gupta – (Rastogi Publications, 2008)
2. Cell Biology by C.B.Powar – (Himalya Publishing House, Bombay)
3. Cell Biology by De Robertis*et.al*– (W.B. Saunders, Philadelphia)
4. Genes (Vol. I – VII) by Levin B. – CBS Publishers
5. Cytology, Genetics & Evolution by Gupta PK (1992) – Rastogi Publications.
6. Principles of Genetics by Sinnott, Dunn and Dobzhansky – (McGraw Hill)
7. Cytogenetics by P.K. Gupta – (Rastogi Publications, 2008)

8. Evolutionary Biology by B.S. Tomar& S.P. Singh – (Rastogi Publications, 2008)
9. The origin of life by K.John – (Reinhold Publishing Corpn)
10. The evolution of Man by G.W.Lasker – (Holt, Rinehart & Winston)

PRACTICALS

Exam Duration : 3 hrs **C3 : 50**

Objectives:

- To acquire techniques for preparation of slides to study mitosis and meiosis and cell organelles;
- To develop skills of mounting giant chromosomes**;**
- To develop the skill of rearing *Drosophila*;
- To conduct breeding experiment for identifying inheritance and mutation in *Drosophila*;
- To understand the pattern of inheritance in human traits;
- To acquire the skill of making models of fossil forms.

COURSE CONTENT:

1. Staining of mitochondria in the buccal epithelial cells of man.
2. Preparation of mitosis in onion root tips.
3. Micrometry: Use of ocular and stage micrometers to measure cell and nuclear dimensions of human buccal epithelial cells/Study of Barr body.
4. Preparation of slides of grasshopper (*Poecilocerus pictus*) testis for the various stages of meiosis.
5. Preparation of salivary gland chromosomes of *Drosophila* larva/chironomous larva for banding patterns.
6. Study of Karyotype and idiogram of man.
7. Culture of *Drosophila* – Collection, handling, rearing and maintenance of culture: a) Identification of sexes of *Drosophila*, b) Study of the life cycle of *Drosophila*.
8. Sorting out and study of mutant flies of *Drosophila* with reference to their various contrasting characters in comparison with normal flies-vestigial wings, ebony body, curled wing, sepia eye, white eye and bar eye.
9. Identification of blood groups (ABO) and Rh factor in man.
10. Study of fossil models of Trilobites and fishes/Archaeopteryx.
11. Study of cranial capacity and feature of skulls of prehistoric to modern man.

Project 1: Conducting breeding experiments to verify the law of segregation, law of independent assortment and law of sex linked inheritance

OR

Project 2: Analysis of inheritance of selected traits in human population; PTU–test, blood group distribution pattern, rolling of tongue, ear lobe attachment, baldness etc.

PROFESSIONAL EDUCATION COURSES

BSE VII.4 :CREATING AN INCLUSIVE SCHOOL

Credits: 4 (2L+ 2T +1P) **Marks: 100**
Contact hrs per week: 6 **C1 + C2: 50**
Exam Duration: 2 hrs **C3: 50**

Objectives

The student teacher will be able to:

- Understanding the meaning and significance of inclusive education.
- Appreciate the special needs of Individuals with diverse needs.
- Get Familiarized themselves with the concept of Inclusive Education.
- Understand the nature and needs of different categories of disabled children.
- Understand the concept of Special Education, Integration and Inclusion.
- Understand the different considerations and provisions for facilitating inclusion.
- Understand and Acquire the Skills of Adapting Curriculum to meet the need of the Students with Diverse needs

COURSE CONTENT

Unit I : Basic Concepts and Introduction to Inclusive Education

Meaning of Impairment, Disability and Handicap;Concept of Special Educational Needs and Diverse Needs, Difference between Special Education, Integration and Inclusive Education. Significance of Inclusive Education; Factors Affecting and Promoting Inclusion.

Unit II : Nature and Needs of Diverse Learners-Identification of Diverse Learners in the Classroom

Sensory Impairment: Hearing impairment and Visual impairment
Physical Disabilities: Orthopaedic impairment, Cerebral Palsy, Special Health Problems, Congenital defects; Slow Learners and Under Achievers; Intellectual Disability; Learning disabilities and ADHD; Autism Spectrum Disorders; Multiple disabilities ; Emotional and Behavioural Problems; Gifted and Creative; Socially Disadvantaged, Economically Deprived, Religious and Linguistic Minorities, Inhabitants of Geographically Difficult Areas

Unit III: Preparing Schools for Inclusion-General Considerations and Provisions

Concept of Inclusive School, Competencies and Characteristics of inclusive Teacher

Physical Consideration, Socio-Emotional Considerations, Curricular Considerations
Provision of Assistive devices, equipment's and technological support. Special provisions in Evaluation

Unit IV : Inclusive Practices in Classroom

Making learning more meaningful: Responding to special needs by developing strategies for differentiating content, curriculum adaptation and adjustment, lesion planning and TLM.
Pedagogical strategies to respond to needs of individual students: Cooperative learning strategies in the classroom, peer tutoring, buddy system, reflective teaching, multisensory

teaching. Use of IT suitable for different disabilities.

Practicum

- Collection of data regarding children with special needs.
- Visit to Inclusive Schools and to observe classroom transaction of any one of such school and make a report of the same.
- Identifying one/two pupils with special needs in the primary schools and preparing a profile of these pupils.
- Preparation of teaching aids, toys, charts, flash cards for children having any one type of disability. (Visit to Resource Room)
- Preparation of Lesson Plan, instruction material for teaching students with disability in inclusive school.
- Developing list of teaching activities of CWSN in the school.

Visits to different institutions dealing with different disabilities and Observation of their Classroom.

* In addition, school and community based activities may be organized.

References:

1. Fimian, M.J., Fafard, M., and Howell, K.W.: *A Teacher's guide to Human Resources in Special Education: Para Professionals, Volunteers, and peer tutors.* Boston: Allyn and Bacon, Inc.
2. Furth, H. (1964). *Thinking without Language.* New York: Free Press.
3. Hallahan, D.P. and Kauffman, J.K. (1988). *Exceptional Children: Introduction to special Education.* N.J.: Englewood Cliffs.
4. Jangira, N.K. (1986). *Special Education Scenario in Britain and India*. Gurgaon: The Academic Press.
5. Jangira, N.K. (2013). NCERT: The Mother of Inclusive Education, Regional Institute of Education NCERT, Ajmer. (Also available on Google search Jangira special education).
6. Julba, A. (2014) Teachers creating Inclusive classrooms: Issues and challenges – A research study
7. Kapoor, S. (2015). Index of Inclusive School Quality, Brotherhood, Delhi.
8. Kothari, R.G. and Mistry, H.S. (2011). *Problems of students and Teachers of the special schools – A study of Gujarat state*. Germany: VDM Publication.
9. Maitra, K. & Saxena, V. (ed)(2008) *Inclusion: Issues and Perspectives,* Kanishka.
10. Meadow, K.P. (1980*). Deafruss and child development.* Berkley, C.A.: University of California Press.
11. Messily,K. (2012). Confronting Marginalisation in Education: A Framework for Promoting inclusion, Routledge, London.
12. Mithu, A. and Michael, B. (2005). *Inclusive Education: From rhetoric to Reality*, New Delhi: Viva Books Pvt. Ltd.
13. NCERT (2006) Position Paper: National Focus Group on Education of Children with Special Needs, NCERT, New Delhi.
14. NCERT (2013) Training and Resource Material on Adolescence Education, New Delhi, available on www.aeparc.org

15. Oza, D. and Pandit, R. (2011). *Management of behavioural problems of children with mental retardation*. Germany: VDM publication.
16. Premavathy, V. and Geetha, T. (2006): Integrated and Inclusive Education DSE(VI) Manual: New Delhi, Krishna Publication.
17. Reed, M. (1984). *Educating Hearing Impaired Children.* Milton Keynes: Open University Press.
18. Sharma, P.L. (1988). *A Teacher's Handbook on Integrated Education of the Disabled*. New Delhi: NCERT.
19. Ramaa S : Website: s-ramaa.net (for various publications)
20. Voluntary Health Association of India. *Disabled 'Village Children' – A Guide for Community Health Workers, Rehabilitation Workers, and Families.*
21. World Bank (2003) Inclusoive Education: Achieving Education for all including those with Disabilities and special Education Needs

Web Resources

- IBE-UNESCO (2016). Training Tools for Curriculum Development - Reaching Out To All Learners: a resource pack for supporting Inclusive Education, Ibe.training@unesco.org, http.//www.ibe.unesco
- Video on A World for Inclusion (2007) by UNESCO, directed by David Atrakchi, 20 minutes,http://www.unesco.org/archives/multimedia/index.php?s=films_details&pg=33&id=213
- Children with Disabilities (2012), by UNESCO, 23 minutes, http://www.unesco.org/archives/multimedia/index.php?s=films_details&pg=33&id=2758
- Inclusive Education: Approaches, scope and Content (2008), by UNESCO, produced by International Bureau of education, 11 minutes, http://www.unesco.org/archives/multimedia/index.php?s=films_details&pg=33&id=3314
- Inclusive Education: Learners and Teachers (2008), by UNESCO, produced by International Bureau of education, 14 minutes, http://www.unesco.org/archives/multimedia/index.php?s=films_details&pg=33&id=3316
- Preparing Teachers in Asia-Pacific for Inclusive Education, (2012), by UNESCO, 3 minutes, http://www.unesco.org/archives/multimedia/index.php?s=films_details&pg=33&id=2030
- Preparing teachers for inclusive education: Part 3 & 4, by UNESCO, produced by Lesotho, Ministry of Education, 21 minutes, http://www.unesco.org/archives/multimedia/index.php?s=films_details&pg=33&id=418
- Toward Inclusive schools - Special needs in the classroom, by UNESCO, directed by Mike Fowler, 6 minutes, http://www.unesco.org/archives/multimedia/index.php?s=films_details&pg=33&id=488
- Training Video: Special Needs in the Classroom, (1992), by UNESCO, directed by Mel Ainscow, 46 minutes, http://www.unesco.org/archives/multimedia/index.php?s=films_details&pg=33&id=405
- Including Children with Special Needs Primary Stage (2014), NCERT,http://www.ncert.nic.in/pdf_files/SpecialNeeds.pdf
- Including Children with Special Needs Upper Primary Stage, (2015), NCERT, http://www.ncert.nic.in/gpPDF/pdf/tiicsnups101.pdf
- Julka, A. (2007) Meeting Special Needs in Schools: A Manual, NCERT, http://www.ncert.nic.in/html/pdf/inclusive_education/COVER.pdf

- Position Paper National Focus Group on Education of Children with Special Needs, NCERT, http://www.ncert.nic.in/new_ncert/ncert/rightside/links/pdf/focus_group/special_ed_final1.pdf
- Learning Curves, Inclusive education (2014), Azim Premji Foundation, http://www.teachersofindia.org/en/periodicals/learning-curve-issue-xxiii

BSE VII.5 :HEALTH AND PHYSICAL EDUCATION

Credits: 2 (1L+ 0T +1P) **Marks: 100**
Contact hrs per week: 3 **C1 + C2: 50**
Exam Duration: 2 hrs **C3: 50**

Objectives

The student teacher will be able to:

- to build a scenario of Health Education in India.
- to develop a Knowledge Base of the Most Common and Uncommon Diseases in India; their Diagnosis & Remediation.
- Prospective Teacher Educators to learn the Techniques Related to Health Risks & Learn How to Fix these.
- Prospective Teacher Educators to study the Health Education Vision & Mission of India.
- To acquire the skills for physical fitness, correct postures, habits and activities for development
- Acquire skills to practice yogasanas and meditation and learn the skills of concentration, relaxation, dealing with stress and strain
- Understand and develop psychological abilities as life skills to deal with growing up issues like HIV and AIDS and prevention of substance issues
- Understand the process of assessment

COURSE CONTENT

Unit I: Health Education Scenario in India

Introduction to the concept of health, significance and importance in the context of ancient and modern Indian perspective
Identity of Educational Institutional Plants: Structure, Infra-Structure and Environment, Time-Space-Personnel-Material Constellation Educational Management System, Emerging Health & Total Quality of the Educational Institutions, Status of Health Education in India from Pre-Natal Education through Higher Education, Yoga & Yog, Health & Hygiene, Clean Toilets, Work & Leisure, Quality of Health – Role of Education, Administrators, Teachers, Students, Supporters,

Unit II: Tech-related Health Risks

Identification of the technological health hazards – Smartphone Stress, Acne caused by the Cell Phones, Blackberry Stress Injuries to the Thumb, Radiation from the cell phones, Cell Phone Sickness, Cell Phone & Car Accidents, Allergies & Phones, Crazy Phones, Computers

Causing Wrist Pain, Back & Neck Pain, Decreased Sperm Count from the WIFI, Laptop Burns, Laptop Headaches, Sleeping Problems from the Laptops, Decreased attention span from using Face-book, The Internet Causing Anxiety, Headphone Use leading to Accidents, Hearing Loss from Headphones, Visual Impairment, Death from Social Networking, Environmental Degradation, Aggression, Social Crimes--- Evolving Controlling & Regulatory Mechanisms.

Unit III: Approaches to Sound Health

Games, Sports & Athletics.
Physical fitness, strength, endurance and flexibility, its components, sports skills, indigenous and self-defence activities.
Games and sports – athletics (general physical fitness exercises), games (lead-up games, relays and major games) rhythmic activities, gymnastics and their impact of health.
Fundamental skills of games and sports; Sports for recreation and competition; Rules and regulation of sports; sports ethics; sports awards and scholarships, sports- personship.
Yoga – Raja Yoga, Karma Yoga, Bhakti Yoga, Jnana Yoga.
Safety and security – disasters in and outside schools, ways of prevention, safety from snake and dog bites, animal attacks, prevention and treatment.
Occupational health hazards and its prevention; Commonly-abused substance and drugs and ways of prevention and inhabitation.
Libraries, Laboratories, Classrooms, Halls, Play Fields, Water Tanks, Swimming Pools, Community Pools, Roads Human Development Index (HDI), Health: Vision, Goals and Objectives of Government of India, Experiments on Influence of Surroundings & Thought, Science of Laughter & Smiles, Health Observation Programs, Impact of TV Serials.
Role of Institutions (schools, family and sports), health services, policies and major health and physical education-related programme, blood banks, role of media.

Unit IV: First Aid – Principles and Uses

Structure and function of human body and the principles of first aid., First aid equipments.
Fractures-causes and symptoms and the first aid related to them, Muscular sprains cause, symptoms and remedies, First aid related to hemorrhage, respiratory discomfort, First aid related to Natural and artificial carriage of sick and wounded person, Treatment of unconsciousness, Treatment of heat stroke, General disease affecting in the local area and measures to prevent them.

Practicum

Surfing to know the diseases in India.
Preventive & Ameliorative measures for health hazards.
Playing Games.
Athletics.
Yoga.
Reflective Dialogues on Serials, such as, Satyamev Jayate on Health of the People.
Preparation of inventories on myths on exercises and different type of food.
Make an inventory of energy rich food and nutritious food (locally available) indicating its health value.
Make an inventory of artificial food and provide critical observations from health point of view.

Home remedies as health care.
Role of biopolymers (DNA) in health of child.
Medicinal plants and child health.
Strategies for positive thinking and motivation.
Preparation of first aid kit.

*** In addition, school and community based activities may be organised.**

References:

1. Arora,P. (2005) Sex Education in schools, Prabhat Prakashan
2. K.Park "Preventive and Social Medicine" Banarsidas Bhanoth, Publishers Nagpur Road, Jablapur, India.
3. NCERT(2013). Training and Resource materials on Adolescence Education, NCERT, New Delhi (This material is also available on www.aeparc.org.www.ncert.nic.in
4. NCERT(2014). Population Education, Source Material, NCERT, New Delhi.
5. Stephen, J. Williams, Paul R. Torrents, "Introduction to Health Service", Delmore Publications.

Physical Education

1. Deboarh, A. Wuest, Charles, A. Bucher: "Foundation of Physical Education Exercise Science and Sports", Tata McGraw Hill Pvt. Ltd., New Delhi.
2. John, E. Mixton, Ann, E. Jewett: "An Introduction to Physical Education, W.B. Saunders Company, London.
3. John, Cheffers; Tom, Evaul: "Introduction to Physical Education – Concept of Human Movement". Prentice Hall Engle Wood: New Jersey.
4. Bette J., Logdson & Others, "Physical Education for Children", Lea and Febiger, Philadelphia..
5. Roberts, S. Weinberg & Daniel Gould, "Foundation of Sports and Exercise Psychology", Human Kinetics Publication.
6. A.K. Uppal, Lawrance Gray Kumar, "Biomechanics in Physical Education and Exercise Science: Friends Publication, New Delhi.
7. Jack, H. Wilmore, David, L.. Costil, W. Larry Kenney, "Physiology of Sports and Exercise: Human Kinetics Publication.

Yoga

1. Swami Satyanand Saraswati, "Asana Pranayama Mudra Bandh", Bihar School of Yoga, Munger.
2. M.M. Ghore, "Anotomy and Physiology of Yogic Practices". Lonavala Yoga Institute, Lonavala.
3. Gharote, M.L. (2004). Applied Yoga, Kaivalyadhama S.M.Y.M. Samiti, Lonavala.
4. "Yogasana" Morarji Desai National Institute of Yoga, New Delhi.
5. "Pranayama" Morarji Desai National Institute of Yoga, New Delhi.
6. MDNIY (2010). "Yoga Teachers Manual for School Teachers, New Delhi.
7. NCERT (2015). Yoga: A Healthy Way of Living Upper Primary Stage, New Delhi.
8. NCERT (2015). Yoga: A Healthy Way of Living Secondary Stage, New Delhi.
9. Agarwal, Satya P. (1998). The social role of the Gītā: how and why, Motilal Banarsidass, ISBN 978-81-208-1524-7, retrieved 17 June 2010.
10. Goel, Devraj & Goel, Chhaya (2013). Universe of Swami Vivekananda & Complete.
11. Wholistic Social Development, CASE Publication under UGC SAP, The M.S. University of Baroda, Vadodara.

12. Jason Liu and Dr. Gwendalle Cooper (2009) *Scientific Analysis of the Effects of Falun Dafa* Presented at International Conference of Psychologists, February 27, 2009 by Catherine Hennessy.
13. Mehroo D. Bengalee (1976).*Child Guidance*. Sheth Publishers, Educational Publishers, 35, Everest, Pedder Road, Bombay.
14. Ministry of Health & Family Welfare, Government of India, *Annual Report to the People on Health*, December 2011.
15. Porter, Noah (2003). *Falun Gong in the United States*: An Ethnographic Study, Master Thesis, Department of Anthropology, College of Arts and Sciences, University of South Florida.
16. Wu JY, Feng, L, Park , H-T, Havlioglu N, Wen L, Tang H, Bacon KB, Jiang Z, Zhang X, Rao Y. (2001). *Molecule that guides Nerve Calls Directs Immune Cells*, Science Daily, Apr. 20.

Web Resources

Position Paper National Focus Group on Health and Physical Education, NCERT
http://www.ncert.nic.in/new_ncert/ncert/rightside/links/pdf/focus_group/health_prelims_final.pdf
Learning curves: sports in education, (2013) Azim Premji Foundation http://azimpremjifoundation.org/pdf/learning-curve-17.pdf
www.FalunDafa.org
www.http://greatist.com/health/*19-worst-tech-related-health-risks*

BSE VII.6 :READING AND REFLECTING ON TEXT

Credits: 2 (1L+ 1T +0P) **Marks: 100**
Contact hrs per week: 3 **C1 + C2: 50**
Exam Duration: 2 hrs **C3: 50**

Objectives

The student teacher will be able to:

- Understand the meaning, process, importance and characteristics of reading.
- Understand and apply different levels, types, techniques and methods of reading.
- Acquaint with the skills of reading different types of texts.
- Develop different types of reading skills through various activities and met cognition
- Learn the skills of reading comprehension and to enhance vocabulary.
- Acquaint with the problems of reading across curriculum.

COURSE CONTENT

Unit I: Introduction to Reading

Reading – Meaning and Process, Importance of Reading across Curriculum, Characteristics of Reading, Developing reading skills.Role of libraries in promoting reading habits

Unit II: Techniques and Methodology of Reading

Levels of reading – literal, interpretative, critical and creative, Types of reading – intensive

and extensive reading, oral & silent reading, Reading techniques – skimming and scanning. Methodology of reading

Unit III: Reading the Text

Types of Texts – Narrative, expository, descriptive, suggestive, empirical, conceptual, ethnography, policy documents, field notes; Importance of Different Texts in Curriculum

Unit IV : Developing Reading Skills and Reading Comprehension

Developing Critical Reading Skills, Developing Reflective Skills, Activities for Developing Reading Skills, Developing Metacognition for Reading, Developing Reading Comprehension Developing Vocabulary for Reading, Problems of Reading

Practicum

- Divide the class in small group and provide different kinds of texts and instruct them to read and reflect according to the nature of text.
- Divide the group and provide one text and suggest students to make different interpretations.
- Design vocabulary games to enhance vocabulary.
- Read the text and provide a five words summary to each paragraph.
- Reading and comprehension exercises.
- Skim through the text and give suitable title to the text.
- Complete given text in stipulated time and summarize it in 6/7 lines with a suitable title.
- Making an oral presentation
- Organising a debate, discussion based on their reading
- Preparation of a poster
- Making a collage
- Displaying appropriate texts/graphic on bulletin board
- Addressing morning assembly during their internship in schools
- Making a power point presentation on selected topic
- Submission of written articles/assignments
- Writing maintaining reflective journals

*** In addition, school and community based activities may be organized with provisions for visits to innovative centres of pedagogy and learning, innovative schools, educational resource centres, etc. Action research based on teaching learning and school and community could be conducted.**

References:

1. Bright, J.A., and McGregor, G.P. (1970). *Teaching English as a Second Language.* ELBS: Longman.
2. Doff, A. (1988). *Teach English: Training Course for Teachers.* Cambridge: Cambridge University Press.
3. Hill, L.A., and Dobbyn, M.A. (1979). *Training Course, Trainer's Book.* London: Cassell.
4. Hubbard, P., and Hywel, J. et al (1983). *A Training Course for TEFL.* Oxford University Press.
5. Joseph, K.S. (2004). *Self Instruction in English Grammar and Figures of Speech.* Vadodara: Gold Rock Publications.
6. Mukalel, J.C. (1998). *Approaches to English Language Teaching.* New Delhi:

Discovery Publishing house.
7. Mukalel, J.C. (1998). *Creative Approaches to Classroom Teaching.* New Delhi: Discovery Publishing house.
8. Mukalel, J.C. (1998). *Psychology of Language Teaching.* New Delhi: Discovery Publishing House.
9. Mukalel, J.C., and Ahmed, S. B. (1984). *Teaching English in India.* New Delhi: Arya Book Depot.
10. Nagaraj, G. (1996). *English Language Teaching Approaches, Methods and Techniques.* Calcutta: Orient Longman.
11. Richard, J.; Theodore, S. and Rodgers, T.S. (1968). *Approaches and Methods in Language.* Cambridge University Press.
12. Venkateswaran, S. (1995). *Principles of Teaching English.* New Delhi: Vikas Publishing House.
13. Wilkins, D.A. (1982). *Linguistics in Language Teaching.* London: Edward Arnold.
14. Willis, J. (1981). *Teaching English through English ELBS.* England: Longman Ltd.
15. Yule, G. (1985). *The Study of Language.* Cambridge: Cambridge University Press.
16. My experiments with the truth – *Autobiography of Mahatma Gandhi*
17. The Little Prince – *Antain de Saint* – Exupery
18. Cultural Heritage – Dr. S. Radhakrishnan
19. Periodicals Like – Outlook, India Today, Economic and Political Weekly, Business Today, Journals of Education, Organiser – weekly
20. Recognizing Different Types of Text

Web Resources

- http://www.bbc.co.uk/skillswise/factsheet/en03text-l1-f-different-types-of-text

Models of Reading Process

- http://people.ucalgary.ca/~mpeglar/models.html
- http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3001687/
- http://www.tarleton.edu/Faculty/gentry/reading%20models.html

Reflective Skills

- http://www.skillsyouneed.com/ips/reflecting.html
- http://www.skillsyouneed.com/ps/reflective-practice.html

BSE VII.7A Internship in School Subject 1 – Physical Science
&
BSE VII.7B :Internship in School Subject 2 – Mathematics
OR
BSE VII.7C : Internship in School Subject 2 – Biological Science

(Evaluation in each school subject shall be as per the break up shown below)*

Credits : 6+6 **Marks: *100**
Duration : 10 Weeks **C1 + C2 : 50**
C3 : 50

The activity is divided into three phases:

A. Pre – internship - 2 weeks
B. Internship - 6 weeks
C. Post internship - 2 weeks

A. Pre internship

Objectives:

- To facilitate student teachers in designing and executing lessons in each pedagogy.
- To develop in student teachers the skills of observation and evaluating teaching of their peers

Activities
The student teachers will
- plan and teach minimum 3 lessons in each pedagogy
- observe minimum 5 lessons of their peers in each pedagogy
- participate in the mentoring sessions to plan lessons under the guidance of mentors.

B. Internship

Objectives:

To provide the student teachers with the field experience of getting attached to a school for a long duration and develop professional skills of teaching, participate in various day to day functions of schools, and in organizing various activities.

Activities

- The student teachers will teach 20 lessons at secondary level in each pedagogy.
- The student teachers will observe minimum of 5 lessons at upper primary level and 10 lessons at secondary level of their peers in each pedagogy.
- The student teachers will organize various activities- co-curricular and extended subject based in the school.
- The student teachers will participate in various academic and administrative activities including monitoring and supervising students in school conducted tests and examinations.

- The student teachers will diagnose the learning difficulties of students and provide remedial instruction.
- The student teachers will conduct CCE and unit tests and prepare evaluation records
- The student teachers will carry out action research project, analyse and write the report.

C. Post Internship

Activities

- Submission of internship records - evaluation records, activity record, observation records, reflective diary

- PPT Presentation of reflections

Evaluation in each pedagogy is as follows:
C1 – Pre-internship activities
C2 – Internship records and post-internship presentation
C3 – Internship in teaching

EIGHTH SEMESTER

DISCIPLINE SPECIFIC ELECTIVE

PHYSICS

BSE VIII.1A :SOLID STATE PHYSICS

Credits: 3 (1L + 1T +1P) **Marks: 100**
Contact hrs per week: 5 **C1 + C2: 50**
Exam Duration: 2 hrs **C3: 50**

Objectives:

To enable students to apply the basic knowledge of classical and quantum mechanics for an understanding of physics of nuclei and of solids.

COURSE CONTENT:

Unit I: Crystal Structure

Solids: Amorphous and Crystalline Materials. Lattice Translation Vectors. Lattice with a Basis – Central and Non-Central Elements. Unit Cell. Miller Indices. Reciprocal Lattice. Types of Lattices. Brillouin Zones. Coordination number, packing fraction for cubic crystals (sc, bcc and fcc). Diffraction of X-rays by Crystals. Bragg's Law.

Unit II:

Elementary Lattice Dynamics: Lattice Vibrations and Phonons: Linear Monoatomic and Diatomic Chains. Acoustical and Optical Phonons. Dulong and Petit's Law, Einstein and Debye theories of specific heat of solids. T^3 law.

Magnetic Properties of Matter: Dia-, Para-, Ferri- and Ferromagnetic Materials. Classical Langevin Theory of dia – and Paramagnetic Domains. Curie-Weiss Law, Discussion of B-H Curve. Hysteresis and Energy Loss.

Unit III:

Electrical Properties: Free electron model of a metal, solution of one dimensional Schroedinger equation in constant potential, Density of states. Fermi energy, Energy bands in solids, Distinction between metals, semiconductors and insulators. Kronig- Penney model. P and N type Semiconductors. Conductivity of Semiconductors, mobility. Hall effect- Expression for Hall coefficients. Applications of Hall effect.

Dielectrics: Dielectric Properties of Materials: Polarization. Local Electric Field at an Atom. Depolarization Field. Electric Susceptibility. Polarizability. Clausius Mosotti Equation.

Unit IV: Superconductivity

Superconductivity: Qualitative description,. Experimental Results. Critical Temperature. Critical magnetic field. Meissner effect. Type I and type II Superconductors, London's Equation and Penetration Depth. Isotope effect. High temperature superconductors Applications

Reference Books:

1. Charles Kittel, Introduction to Solid State Physics, 8th Ed., Wiley India Pvt.Ltd., 2004.
2. A J Dekker, Solid State Physics, Macmillan, 1965.
3. J.P. Srivastava, Elements of Solid State Physics, 2nd Ed., Prentice-Hall of India, 2006.
4. Leonid V. Azaroff, Introduction to Solids, Tata Mc-Graw Hill, 2004.
5. M. A. Wahab, Solid State Physics: Structure and Properties of Materials, Alpha Science International, Ltd., 2005.
6. Neil W. Ashcroft and N. David Mermin, Solid State Physics, Cengage Learning, 1976.
7. S O Pillai, Solid State Physics, NEW AGE, 2009.
8. G. I. Epifanov, Solid State Physics, Central Books Ltd., 1979.
9. M. Ali Omar, Elementary Solid State Physics, Pearson India, 1999.
10. H. Ibach and H Luth, Solid-state Physics, Springer, 2009.

PRACTICALS

Exam Duration: 3 hrs **C3: 50 Marks**

Objectives:

- To provide training in the broad methodology of science through investigatory type and open-ended laboratory exercises.
- To validate the theoretical basis of the experiments.

COURSE CONTENT:

(A minimum of TEN experiments to be selected from the following)

1. Measurement of susceptibility of a paramagnetic solution (Quinck`s Tube Method)
2. To measure the Magnetic susceptibility of Solids.
3. To determine the Coupling Coefficient of a Piezoelectric crystal.
4. Determination of Hall coefficient in semiconductors.
5. Determination of Curie temperature– ferromagnet.
6. Determination of work function of a metal using R-D equation.
7. To measure the Dielectric Constant of a dielectric Materials with frequency.
8. To determine the complex dielectric constant and plasma frequency of metal using Surface Plasmon resonance (SPR).
9. To determine the refractive index of a dielectric layer using SPR.
10. To study the PE Hysteresis loop of a Ferroelectric Crystal.
11. To draw the B- H curve of iron using a Solenoid and determine the energy loss from Hysteresis.
12. To measure the resistivity of a semiconductor (Ge) crystal with temperature by four-probe method (from room temperature to 150^{o} C) and to determine its band gap. Franck-Hertz experiment.

13. Powder XRD pattern of KCl.
14. Powder XRD pattern of NaCl.
15. Powder XRD pattern of $CaCl_2$.
16. Solar cell experiment.
17. Frequency resonance of LR circuit.
18. Polarisation by reflection-Brewster's law.

References:

1. B.L.Flint & H.T.Worsnop, Advanced Practical Physics for students, Asia Publishing House, 1971.
2. E Armitage, Practical Physics, John Murray.
3. PSSC Physics Laboratory Guide.
4. S.Panigrahi & B.Mallick, Engineering Practical Physics, Cengage Learning India Pvt. Ltd., 2015
5. Indu Prakash and Ramakrishna, A Text Book of Practical Physics, 11th Edition, Kitab Mahal, New Delhi, 2011.
6. Jerry D Wilson and Cecilia A. Hernández-Hall Physics Laboratory Experiments 7th Edition, Cengage Learning, 2009.
7. S.Panigrahi & B.Mallick, Engineering Practical Physics, Cengage Learning India Pvt. Ltd., 2015.
8. Michael Nelson and Jon M. Ogborn, Advanced level Physics Practicals, 4th Edition, reprinted, Heinemann Educational Publishers, 1985.

DSE 2B BOTANY

BSE VIII.1B :MOLECULAR BIOLOGY, BIOCHEMISTRY & BIOTECHNOLOGY

Credits: 3 (1L + 1T +1P) **Marks: 100**
Contact hrs per week: 5 **C1 + C2: 50**
Exam Duration: 2 hrs **C3: 50**

Objectives:

- To understand the structure and functions of biological macromolecules;
- To understand and appreciate the importance of nucleic acid and gene research in modern times;
- To acquaint students with the tools and techniques of biotechnology, the processes involving gene manipulation and their applications.

COURSE CONTENT :

Unit I :

Discovery, brief history of DNA and RNA. (i) DNA: types, molecular structure, characteristics, structural properties and functions. Satellite and repetitive DNA, mitochondrial and plastid DNA, plasmid, DNA damage and repair, replication of DNA in

prokaryotes and eukaryotes. (ii) RNA : Types, structure, characteristics, structural properties and functions, Role of RNAs in protein synthesis.
Gene structure and regulation in prokaryotes, operon concept – lac and tryptophan operon, genetic code.

Unit II :
Nitrogen Metabolism : Forms of nitrogen, cellular conversion of nitrates to ammonium ions, assimilation of NH+4 ions, biological nitrogen fixation, amino acids – nature, classification, structures, synthesis of amino acids - reductamination and transamination.
Proteins – classification, structure – primary, secondary, tertiary and quaternary, Biosynthesis of proteins – transcription, m-RNA processing, translation. Inhibitors of protein synthesis.

Unit III :
Carbohydrates : Introduction, classification, chemical structures of mono, oligo and polysaccharides, synthesis and breakdown of sucrose and starch.
Lipids : Introduction, classification, chemical structures, saturated and unsaturated fatty acids, synthesis and breakdown of fatty acids, b- oxidation.
Enzymology : Discovery, nature, nomenclature and classification, mechanism of enzyme action, lock and key hypothesis, induce-fit hypothesis, regulation of enzyme action, inhibitors, prosthetic groups and coenzymes, factors affecting enzyme action.

Unit IV : Biotechnology and Bioinformatics
a) Tools and techniques, cloning vectors, brief account of genomics and c-DNA library, interferons, transposable elements, PCR, bio-informatics.
b) Applications of Biotechnology – functional definition and applications, brief account of DNA finger printing, Agrobacterium – mediated gene transfer, achievements in crop improvement, transgenic plants.
c) Brief account of recent advances in Plant bio-technology; products of bio technology
d) Brief account of Bioinformatics – genomics, proteomics.
References:

1. Lea, P.J. and R.C.Leegood, 1999, Plant Biochemistry and Molecular Biology, John Wiley & Sons, England.
2. Lehninger, A.B., Principles of Biochemistry, CBS Publishers and Distributors, New Delhi.
3. Srivastava, H.S.2005, Plant Physiology, Biochemistry and Biotechnology, Rastogi Publications, Meerut.
4. Jain.J.L. 1994, Fundamentals of Biochemistry, Sultanchand & Co., New Delhi.
5. Old, R.W. and S.B.Primrose, 1989, Principles of Gene Manipulation, Blackwell Scientific Publication, Oxford, UK.
6. Lodish, H., A.Berk, S.L.Zipursky, P.Matsudaiva, D. Baltimore, and J.Darnell, 2000. Molecular Cell biology, W.H. Freeman & Co., New York.
7. Alberts, B., D.Bray, J.Lewis, M.Raff, K.Roberts and I.O.Watson, 1999, Molecular Biology of Cell, Garland Publishing Co., Inc., New York.
8. Malacinski, G.M., 2005, Essentials of Microbiology (4th Ed.)., Narosa Publishing House, New Delhi.

PRACTICALS

Exam Duration : 3 hrs **C3 : 50**

Objectives :
• To understand the molecular mechanisms operating in cells.
• To familiarize with techniques in biochemistry and biotechnology.

COURSE CONTENT :
1. Isolation of DNA from coconut endosperm.
2. Effect of pH and temperature on activity of amylase in germinating seeds.
3. Study of catalase and peroxidase enzyme activity as influenced by pH and temperature.
4. Separation of amino acids by paper chromatography.
5. Study of root nodules in leguminous plants.
6. To test for the presence of carbohydrates , proteins and lipids.

DSE 2BChemistry

BSE VIII.2 :SPECTROSCOPY, NATURAL PRODUCTS AND HETEROCYCLICS

Credits: 3 (1L + 1T +1P) **Marks: 100**
Contact hrs per week: 5 **C1 + C2: 50**
Exam Duration: 2 hrs **C3: 50**

Objectives:

To develop an understanding of the
- basic principles of Spectroscopy and apply the principles in the structural elucidation of simple organic compounds.
- chemistry of natural products, dyes and drugs, macromolecules and heterocyclic compounds

COURSE CONTENT:

Unit I : Spectroscopy

UV and Visible spectroscopy: Introduction, absorption laws, instrumentation, formation of absorption bands, types of electronic transitions, chromophores, auxochromes, absorption and intensity shifts, solvent effects, Woodward – Fieser rules for calculating absorption maximum in dienes and α,β-unsaturated carbonyl compounds.

IR spectroscopy: Introduction, theory of molecular vibrations, vibrational frequency, factors influencing vibrational frequencies, finger print region and applications of IR spectroscopy.

NMR spectroscopy: Introduction, instrumentation, number of signals, position of signals (Chemical shift), shielding and deshielding effects, factors influencing chemical shifts-inductive effect, anisotropic effect and hydrogen bonding. Splitting of signals, spin-spin coupling, chemical exchange and coupling constant.
Structural determination of simple organic compounds using UV, IR and NMR spectral data.

Unit II: Natural Products
Carbohydrates: Introduction, classification and nomenclature. Configuration of monosaccharides. Erythro and threo diastereomers. Interconversions in carbohydrates – glucose to fructose, fructose to glucose, aldopentose to aldohexose and aldohexose to aldopentose. Epimerisation, mechanism of osazone formation, Formation of glycosides, ethers and esters. Determination of ring size of monosaccharides. Structural elucidation of D(+) glucose. Mechanism of Mutarotation. Constitution of disaccharides - maltose, sucrose and lactose. Introduction to polysaccharides (starch and cellulose) without involving structure determination.
Alkaloids : Introduction, general methods of structural determination, structural elucidation of Conine, Nicotine and piperine
Terepinoids : Introduction, isoprene rule, structural elucidation of Citral and Menthol
Amino acids, Peptides, Proteins and Nucleic acids
Classification, structure and stereochemistry of amino acids. Acid-base behaviour, isoelectric point and electrophoresis. Preparation and reactions of α-amino acids.Classification of proteins. Peptide structure determination - end group analysis, selective hydrolysis of peptides. Solid-phase peptide synthesis. Primary and secondary structures of proteins. Protein denaturation.
Nucleic acids : Introduction, constituents of nucleic acids. Ribonucleosides and Ribonucleotides. The double helical structure of DNA. Types of different RNA and their functions in the synthesis of protiens. Genetic code.

Unit III: Dyes, Drugs and Macromolecules
Dyes: Introduction, Classification of dyes, Colour and constitution (electronic concept), synthesis and uses of Methyl orange, Phenolphthalein, Fluorescein and Indigo.
Drugs: Introduction, classification, structure and synthesis of sulpha drugs- sulphapyridine, sulphathiazole, sulphadiazine and sulphaguanidine, mechanism of action. Antimalarials – plasmaquin, mepacrine and chloroquin.

Macromolecules: Introduction, Classification, Types of polymerization – chain polymerization, step polymerization, free radical polymerization, co-polymerisation, Ionic polymerization, Coordination polymerization. Natural and synthetic rubbers – buna S , butyl rubber and neoprene. Synthetic fibres – nylon 6, nylon 6,6, terylene. Conducting polymers – polypropylenes and polyanilines. Bio-degradable polymers.

Unit IV: Heterocyclic Compounds
Introduction, methods of formation of five membered heterocycles – furan, thiophene and pyrrole. Molecular orbital picture and aromatic characteristics of pyrrole, furan, thiophene and their chemical reactions with particular emphasis on the mechanism of electrophilic substitution. Six membered heterocycles: methods of formation of pyridine, mechanism of nucleophilic substitution reactions in pyridine derivatives. Comparison of basicity of pyridine, piperidine and pyrrole. Introduction to condensed five and six-membered heterocycles, preparation and reactions of Indole, quinoline and isoquinoline with special

reference to Fischer indole synthesis, Skraup synthesis and Bischler-Napieralski synthesis. Mechanism of electrophilic substitution reactions of indole, quinoline and isoquinoline.

References :

1. Organic Spectroscopy by P S Kalsi
2. Organic Chemistry : I L Finar Vol II
3. Application of absorption Spectroscopy to Organic Compounds : John R Dyer
4. Organic Spectroscopy : William Kemp
5. Fundamentals of Molecular Spectroscopy : C N Banwell

PRACTICAL

Exam Duration : 3 hrs **C3 : 50**

Objective:
To develop skills of synthesis and Estimation of organic compounds

COURSE CONTENTS:

1. Two step organic synthesis

1. Synthesis of p-bromoaniline from acetanilide
2. Preparation of o-iodobenzoic acid from anthranilic acid
3. Preparation of m-nitrobenzoic acid from methyl benzoate
4. Preparation of Paracetamol
5. Synthesis of Quinoline

2. Quantitative organic analysis

1. Estimation of aniline/ phenol by bromate-bromide method
2. Estimation of glucose by Fehlings method/ Spectrophotometry using 3,5 dinitro salicylic acid
3. Determination of iodine value of an oil by Wij's method/ Chloramine-T method
4. Determination of saponification value of an ester / oil
5. Estimation of amino acid by formal titration method
6. Estimation of ascorbic acid in Vitamin C tablets by Volumetry
7. Estimation of Paracetamol by titrimetric and spectro photo metric methods.
8. Colorimetric Estimation of proteins by Biuret method

References :

1. Organic synthesis-special techniques V.K. Ahluwalia, 2nd Edition Narosa Publishing House
2. Organic Synthesis A.I. Vogel

DSE 3BMathematics

BSE VIII.3A:COMPLEX ANALYSIS& NUMERICAL ANALYSIS

Credits : 3 (1L + 2T + 0P) **Marks: 100**
Contact hrs per week: 5 **C_1 + C_2: 50**
Exam Duration : 2 hrs **C_3 : 50**

Objectives:
To develop the understanding & application of the concepts of complex analysis in problem solving situations. To enable and apply Numerical methods in solving problems related to real life situations with help of computers, which have become indispensable in modern world.

COURSE CONTENT:

Unit I:
Functions of a Complex Variable, Limits, Continuous Functions, Differentiability, The Cauchy-Riemann Equations, Analytic Functions, Harmonic Functions, Conformal Mappings. Elementary Transformations, Bilinear Transformations, Cross ratio, Fixed Points of Bilinear Transformations.

Unit II:
Complex Integration: Introduction, Definite Integral, Cauchy's Theorem, Cauchy's integral Formula, Higher Derivatives. Power Series**:** Introduction, Sequences and Series, Sequences and Series of Functions, Power Series, Elementary Functions.

Unit III:
Numerical Methods: Numerical Solutions of Algebraic and Transcendental equations, Bisection Method, Method of false position, Iteration method, Newton-Raphson method.
Finite differences, Forward and Backward differences, Weierstrass theorem, Interpolation, Newton-Gregory forward and backward interpolation formulae, Divided differences, Lagrange's interpolation formula.

Unit IV:
Numerical Differentiation: Finding first and second derivatives using interpolation formulae, Difference equations.
Integration: General quadrature formula, Trapezoidal Rule, Simpson's 1/3 rule, Simpson's 3/8 rule, Weddle's rule, Newton-Cotes quadrature formula, Gauss quadrature.

References:

1. Complex Analysis by Ahlfors McGraw Hill International Edition.
2. Introduction to the Theory of Functions of a Complex Variable by Palka, Springer Verlag.
3. Complex Analysis by Serge Lang, Springer Verlag
4. Theory of Functions of a Complex Variable by Shanthinarayan, S. Chand and Co. Ltd.
5. Foundations of Complex Analysis by Ponnuswamy, Narosa Publishing House.

6. An Introduction to the Theory of Functions of a Complex Variable by Copson, Oxford University Press.
7. Complex Variables and Applications by Churchill, Brown and Verhey, McGraw Hill International Book Company.
8. Functions of One Complex Variable by Conway, Narosa Publishing House.
9. Theory and Problems of Complex Variables, Murray R. Spiegel, Schaum Outline Series, McGraw Hill Book Company.
10. Complex Analysis by Armugam, Tangapandi, Somasundaram, Scitech Publications Pvt. Ltd.
11. Numerical Analysis by Guptha, S. Chand and Co. Ltd.
12. Finite Difference and Numerical Analysis by Saxena, S.Chand and Co. Ltd.
13. Introductory Methods of Numerical Analysis by Shstry, PHI.
14. Numerical Methods for Scientists and Engineers, Grewal, Wiley Eastern Ltd.
15. Higher Engineering Mathematics by Grewal, Wiley Eastern Ltd.
16. Advanced Engineering Mathematics by Kreyszig, Wiley Eastern Ltd.
17. Numerical Calculus by William Edmund Milne, Princeton University Press.
18. Introduction to Numerical Analysis by Hildebrand, Tata McGraw Hill Publishing Ltd.
19. Numerical Analysis by Schield, Schaum's Outline Series.
20. Introduction to Numerical Methods by Peter A. Stark, MacMillan Co. Ltd.

DSE 3BZoology

BSE VIII.3B :BIOCHEMISTRY, MOLECULAR BIOLOGY AND BIOTECHNOLOGY

Credits: 3 (1L + 1T +1P) **Marks: 100**
Contact hrs per week: 5 **C1 + C2: 50**
Exam Duration: 2 hrs **C3: 50**

Objectives:

- To enable students to comprehend the modern concepts and applied aspects of biomolecules
- To understand the importance of nucleic acids
- To appreciate the application of biological tools and techniques

COURSE CONTENT:

Unit I: Biochemistry - I

a) Carbohydrates – Classification, chemical structures of mono, oligo and polysaccharides and properties; carbohydrate metabolism – Glycolysis, TCA cycle, electron transport system, gluconeogenesis

b) **Proteins** – Classification and structural properties; Amino acids – Amino acid metabolism, transamination, decarboxylation

c) **Lipids** – Classification and properties; Lipid metabolism – oxidative pathway of saturated and unsaturated fatty acids

Unit II: Biochemistry – II

a) **Enzymology** – Nature of enzymes, nomenclature and classification, mechanism of enzyme action – lock and key hypothesis, induce fit hypothesis; regulation of enzyme action and factors affecting enzyme action, Coenzymes and inhibitors
b) **Vitamins and minerals** – Role of vitamin and minerals in normal health
c) **Nucleic acids:** Discovery, DNA- structure, forms, denaturation and anneling, bacterial, plasmid, plastid and mitochondrial DNA

Unit III: Molecular Biology – I

a) RNA- structure, types (rRNA, mRNA, tRNA), and functions .
b) Replication of DNA in prokaryotes.
c) **Gene expression:** Central dogma; Transcription in prokaryotes; Genetic code; Translation in prokaryotes.

Unit IV: Molecular Biology – II and Biotechnology

a) Regulation of gene expression in prokaryotes – lac operons
b) Genetic engineering: History, restriction endonucleases, ligases, vectors (pBR322, T-DNA), cDNA library, cloning, PCR, bioinformatics
c) Biotechnology: Transgenic animals (giant mouse, transgenic sheep), monoclonal antibodies, gene therapy. Human genome project.

References:

1. Principles of Biochemistry by Lehninger AB (CBS Publishers and Distributors, New Delhi
2. Animal Physiology and Biochemistry by K.V. Sastry – (Rastogi Publications, 2008)
3. Cell and Molecular Biology: Concepts and Experiments by Gerald Karp
4. Molecular Biology of the Cell by Bruce Alberts
5. Molecular Cell Biology by Harvey Lodish, David Baltimore and Arnold Berk
6. Biotechnology: Applying the Genetic Revolution by David P. Clark BA, 2008
7. Biotechnology by V. Kumaresan (Saras Publication)

PRACTICALS

Exam Duration : 3 hrs **C3 : 50**

Objectives:

- To develop the skills of analyzing the enzyme actions
- To identify and estimate the qualitative and quantitative analysis of carbohydrate, protein and fats
- To analyze and separate amino acids
- To develop the skill of isolating DNA

COURSE CONTENT:

1. Effect of temperature on the salivary amylase enzyme activity
2. Effect of pH on the salivary amylase enzyme activity
3. Effect of substrate concentration on the salivary amylase enzyme activity
4. Detection of various enzymes in the digestive tract of cockroach

5. Separation and analysis of amino acids in body fluids and food using paper chromatography
6. Qualitative and quantitative estimation of carbohydrates, proteins and lipids in food/animal tissues
7. Demonstration of separation of proteins/enzymes with electrophoresis
8. Isolation of DNA from kidney/spleen of rat (demonstration)

GENERIC ELECTIVE 2

BSE VIII.4 : INDIAN CONSTITUTION AND HUMAN RIGHTS

Credits 2 (2L+0T+0P) **Max. Marks: 100**
Contact Hours per week: 2 **C1+ C2: 50**
Exam duration: 2 Hrs **C3: 50**

Objectives:
On completion of this course, the student teacher will be able to
- know the importance, preamble and salient features of Indian Constitution
- appreciate the significance of Fundamental Rights, Duties and Directive Principles of State Policy.
- develop an understanding of the strength of the Union Government.
- understand the functioning of the State Government for the unity and the strength of the Democracy.
- know the importance of local self-Government and Panchayati Raj Institutions in India.
- know the meaning, significance, the growing advocacy of Human Rights.

Transaction Mode:
Through Lectures, Group discussions, Interactive sessions, field activities and use of Education Technology.

COURSE CONTENT:

Unit I: Meaning and Importance of the Constitution
Preamble, Salient features, Constituent Assembly and the Spirit of the Indian Constitution.

Unit II: Fundamental Rights, Duties and Directive Principles
Fundamental Rights, Fundamental Duties, and the Directive Principles of the state policy of the Indian Constitution.

Unit III: Union, State and Local Self Governments
Union Government: Parliament, the President and Prime Minister: State Government: Governor and the Council of Minister: Judiciary: Functions and Powers: Panchayat Raj System.

Unit IV: Human Rights
Origin and Development of Human Rights, Growing Advocacy and Declining Trends of Human Rights, Rights of Scheduled Casts, Scheduled Tribes, Minorities, Children and

Women, Human Rights Defenders, Human Rights Violation and Human Rights Organizations.

References:

1.M.V.Pylee, **Indian Constitution**, OUP, New Delhi
2.Granveille Austin, **Indian Constitution**, OUP, New Delhi
3.Rajani Kotari, **Politics in India**, OUP, New Delhi
4.Johari, J C, **Indian Government and Politics**.
5.S R Maheswari, **Local Governments in India (Latest Edition)**
6.R K Arora and Rajani Goyal, **Indian Public Aministration 1995.**
7.C P Bhambri, **Introduction to Indian Constitution**.
8.Subash C Kashyap, **The Working of Indian Constitution,** NBT, New Delhi
9.Subash C Kashyap,**Our Parliament**, NBT, New Delhi
10.Granveille Austin, **Functioning of the Indian Constitution**, NBT, New Delhi.
11.Bipan Chandra**, India after Independence**. Roopa, New Delhi 2000.
12.Arjun Dev, **Source Book on Human Rights**, NCERT, New Delhi.
13.**Human Rights in India: Theory and Practice**, National Book Trust, 2001.

PROFESSIONAL EDUCATION COURSES

BSE VIII.5 :KNOWLEDGE AND CURRICULUM

Credits: 4 (2L+ 2T +0P) **Marks: 100**
Contact hrs per week: 6 **C1 + C2: 50**
Exam Duration: 2 hrs **C3: 50**

Objectives:

This course is designed to help student teachers to

- Understand the concept and the need for curriculum in schools.
- Explore the influences of the knowledge categories, social, cultural, economic and the technological aspects in shaping the present school curriculum and the text books.
- Analyze the principles employed in sequencing the school curriculum and the syllabus at different levels.
- Identify various learning sites and resources operating as curriculum supports in the system.
- Analyze the multiple roles of schools in implementation of curriculum.
- Discuss the roles and responsibilities of curriculum stakeholders.
- Analyse the role of teachers in operational sing the curriculum.
- Examine the processes and criteria commonly used to evaluate curriculum in pursuit of improvement.
- Explore the evaluation approaches adopted to revise the curriculum at the national and state levels.
- Analyze the national curriculum frameworks for necessary reforms proposed and their implications at school level.

- Develop an image of oneself as a curriculum informant, designer, agent, and evaluator.

COURSE CONTENT:

Unit I: Concept and the nature of curriculum

a) Meanings of curriculum; different perspectives of curriculum; need for curriculum in schools.
b) Educational policy reforms leading to curriculum reforms; Relationship between curriculum framework, curriculum , syllabus and text books- their significance in school education.
c) Meaning and concerns of core curriculum-its need and significance in Indian context; Meaning and concerns of Hidden curriculum and spiral curriculum and their relevance to learning.
d) Types of curriculum: subject-centered, activity-centered, environmental centered, and community-centered and their relevance.

Unit II: Foundations of Curriculum Development

a) **Forms of knowledge & Curriculum:** Forms of knowledge and structure of a Discipline, and their characterization in different school subjects; Logical grammar of different school subjects
b) **Nature of learner& learning:** Nature of learner - needs and interests, and different perspectives on learning (behaviourists, cognitivists and social constructivists) and their implications to curriculum development
c) **Socio –cultural**: Importance of society-school relationships ; Societal factors that affect the curriculum ; Multiculturalism, multilingual aspects, and societal aspirations; Social reconstruction, social efficiency, inequality in educational standards, need for common goals and standards;
d) **Technological determinants** : Science and technological advancements, Using the resources of the information society in curriculum development
e) **Some of the critical issues**: environmental concerns, gender concerns .inclusiveness, value concerns, social sensitivity, and globalization.

Unit III: Process of curriculum Development

a) Understanding shifts in emphasis in approach to curriculum; from subject centered and behaviouristic learning to integrated approach involving development of perspectives, activity centered and constructivist orientation;
b) **Behaviouristic orientation**: Formulating aims and objectives – (general, specific - subject wise and level wise); Selecting content and learning experiences – Principles involved; Organizing the content and learning experiences- Principles (continuity, sequence and integration: organizing elements- concepts, skills, and values); breadth of coverage and depth of understanding; applicability and relevance to school curriculum planning
c) **Constructivists orientation**: curriculum embedded in real life contexts; authentic learning in real life contexts leading to knowledge construction; applicability and relevance to school curriculum planning

Unit IV Curriculum Implementation and Curriculum evaluation

a) Operationalising curriculum into learning situations; Planning and converting curriculum into syllabus and curriculum engagement activities.
b) Role of teachers in operationalising curriculum in generating dynamic curricular experiences through i) flexible interpretation of curricular aims ii) concept mapping iii) contextualization of learning v) selecting varied experiences and long range and daily planning, choice of resources, planning assessment etc.
c) Planning and use of curricular materials: Text book; teachers hand book, source book, work book, manuals, and other learning materials such as kits, AV and software materials..
d) School culture and climate in implementing the curriculum.
e) Supports to curriculum engagement: available infrastructure and curriculum sites and resources (library, laboratory, playground, neighbourhood etc); Use of community resources in curriculum engagement .
f) Role of external agencies – National, Regional and State in developing the learning supports (including training of teachers) for curriculum implementation.
g) Meaning of curriculum evaluation; Need for curriculum evaluation
h) Process of curriculum evaluation and renewal: collecting opinions and views on school curriculum and text books from different stakeholders; students' attainability of curricular standards as one of the criterion; evaluation of the discrepancies observed between anticipated and observed inputs, transactions and outputs; critical analysis of text books ;evaluation of other curricular materials;
i) Role of National, Regional and State bodies in empowering the teachers in evaluating curriculum

Sessional Work:

- Review of national curriculum frame works and write a report for presentation and discussion
- Analysis of teachers' handbooks, text books, workbooks, source books followed by Presentations.
- Readings of certain curriculum reviews and articles bearing significance to the course outlined and reflections on them

References:

1. Olivia, P (2004): Developing the curriculum (6th Ed). Allyn & Bacon, Inc. ISBN: 0205412599.
2. Curriculum planning for better teaching and learning by J.G. Saylor and W Alexander (Holt, Rinehart and Winston).
3. Yashpal Committee (1993): Learning without Burden, MHRD, and India.
4. Position paper: National Focus Group on 'Curriculum, Syllabus, Textbooks', NCERT.
5. Lewy, Arieh (1977): Handbook of Curriculum Evaluation, International Institute for educational Planning, France and Longman Inc.
6. Giroux, Henry et.al (1981): Curriculum and Instruction: Alternatives in Education by MC Cutchan Public Corp, Printed in USA.
7. Dewey, John (1959): The Child and the Curriculum, Chicago, the University of Chicago Press.
8. Hilda T (1962): Curriculum and Development- Theory and Practice; Harcourt, Brace and World, Inc.
9. Howson, Geoffrey (1978): Developing a New Curriculum, London: Heinmann
10. NCERT (1988) National Curriculum for Elementary and Secondary Education: A framework.
11. NCERT (2000) National Curriculum Framework For school Education.

12. NCERT (2005) National Curriculum Framework. NCERT publications
13. Schubert W (1986): Curriculum Perspectives, Paradigms and Possibilities, New York: Macmillan.
14. Zias, R (1976): Curriculum Principles and Foundations; New York; Thomas Crowwell.
15. Hirst, Paul (1975) : Knowledge and curriculum, (International Library of the Education volume 12): A collection of Philosophical papers, International library of Philosophy of Education, Routledge publishers
16. Kumar, Krishna and Malla Reddy : Curriculum Development and Educational Technology.

BSE VIII.6 :GUIDANCE AND COUNSELLING

Credits: 4 (3L+ 1T +0P) **Marks: 100**
Contact hrs per week: 5 **C1 + C2: 50**
Exam Duration: 2 hrs **C3: 50**

Objectives

The student teacher will be able to:

- appreciate the nature, purpose and need for guidance and counselling;
- sensitise the student-teachers with the need and relevance of Guidance and counselling.
- demonstrate an understanding of educational, vocational and personal guidance
- develop an understanding of the process of Guidance and Counselling
- understand the process of organization of guidance services in schools
- develop capacity of applying the techniques and procedures of guidance and counselling
- describe various testing and non- testing techniques
- develop the skill of administration and interpretation of psychological tests
- understand the concept and importance of career development.
- analyse the role of the teacher in the provision of Guidance and Counselling
- know the qualities required for good Counsellor

COURSE CONTENT

Unit I: Meaning and Nature of Guidance

Guidance: Concept, aims, objectives, functions and principles.
Need & Procedure for (Educational, Psychological and Social) guidance.
Purposes and Principles of organization of different guidance Services
Organization of guidance services at Secondary Level: Need and Importance
Group Guidance: Concept, Need, Significance and Principles, Organization of Guidance programs in schools.
Role of Guidance Personnel in organization of guidance services in School : Counsellor, Career Master, Psychologist, Doctor, Teacher Counsellor, Head of the Institution, Teacher, Social Worker

Unit II: Meaning and Nature of Counselling

Counselling: Meaning and nature; Difference between Guidance &Counselling; Principles and approaches of counselling, Individual and Group Counselling; Skills in Counselling-Skills for Listening, Questioning, Responding, & Communicating, Listening Attentively to the concerns of the counselee, Negotiating Self Discovery, Decision Making, Problem Solving etc and values such as Patience, Empathy etc.; Methods and Process of Counselling Academic, Personal, Career and Behaviour problems of students with special needs, viz. socio-emotional problems of children with disabilities and deprived groups such as SC, ST and girls, need for Counselling; Professional Ethics and Code of Conduct ; Qualities and Qualifications of an effective Counsellor

Unit III: Tools and Techniques of Guidance

Testing and Non-Testing Techniques for Studying and Appraisal of students : a) Testing Techniques: Intelligence/Mental Ability tests, Aptitude tests, attitude scales, Interest inventories, and Personality Tests, b) Non-testing Techniques: Interview, Observation,and Case Study, c) Tools-Questionnaire, anecdotal record, Cumulative Record Cardsetc,
Role of the teacher in Assessment and Testing.

Unit IV: Career Guidance and Counselling

Educational and Career Information in Guidance and Counselling: Meaning, Importance, collection, types, classification of occupational information; Dissemination of Occupational Information: Class talk, career talk, Group discussion, Preparation of Charts and Poster, Career Exhibition, Career conference; Guidance for gifted, slow learner, socio-economically disadvantaged children; Career development: Meaning and Importance; Teacher's role in Career planning, Vocational training and placement opportunities for CWSN. Broad outline with respect to the emerging courses and career options available in India; Guidelines for Establishment of Guidance Cell or Career Corners in Schools

Suggestive List of Activities:

- Group Guidance-Preparation of Class Talk and One Career Talk
- Visit to different Guidance Centre
- Design a checklist/Questionnaire to collect information on students and classify them under educational, psychological or social problem.
- Preparation of Cumulative Record
- To prepare a Case study and Analysis of Case study
- Administration, Scoring & interpretation of at least two tests: One Mental Ability Test and One Aptitude Test
- Job Analysis of a Counsellor
- Preparation of list of problem behaviours based on observation. Detailed study of the Guidance and Counselling Services available in a given School
- Prepare a Chart and Poster for dissemination of Career Information
- Familiarise and write a report of any one of the Personality Tests used in Guidance and Counselling

References:

1. Aggarwal, J. C. (2004). Educational Vocational Guidance and Counselling, Delhi: Doaba House.

2. Asch, M. (2000). Principles of Guidance and Counselling, New Delhi: Sarup and Sons.
3. Bhatia, K. K., (2002). Principles of Guidance and Counselling, Ludhiana: Vinod Publications
4. Bhatnagar, R. P.; Rani. S. (2001); Guidance and Counselling in Education and Psychology.
5. Chauhan, S. S. (2008). Principles and Techniques of Guidance. UP: Vikas Publishing House Pvt. Ltd.
6. Coorey,S.M (1953).Action Research to Improve School Practices, New York:Teacher's Columbia University
7. Gibson, R.L. and Mitchell (2008). Introduction to counselling and Guidance. New Delhi:PHI Learning Pvt. Ltd.
8. Granz, R. M. (2005). Foundation and Principle of Guidance, Boston: Allyn& Bacon.
9. Gupta, V. K. (2004). Educational Guidance and Counselling, Ludhiana: Ankur Publications.
10. Jones, J. A. (1970). Principles of Guidance, Bombay: Tata, New York: McGraw Hill.
11. Joneja G. K. (1997); Occupational Information in Guidance, NCERT publication
12. Kakkar, S.B (2015) Educational Psychology, *PHI Learning: Publications*
13. Kocher, S. K. (2007). Educational Guidance and Counselling, New Delhi: Sterling.
14. Myres, G. E. (2005). Principles and Techniques of Vocational Guidance, New York: McGraw Hill.
15. Nanda, S. K.and Sagar, S. (1972). Fundamentals of Guidance. Chandigarh: N.B.S. Educational Publishers.
16. Nayak A.K. (2004); Guidance and Counseling
17. NCERT (2008). Counselling Process and Strategies (Module 2). New Delhi: NCERT.
18. NCERT (2008). Guidance for Human Development and Adjustment (Module3) New Delhi: NCERT.
19. NCERT (2008). Introduction to Guidance (Module 1). New Delhi: NCERT.
20. NCERT (2005). National Curriculum Framework-2005,NCERT,New Delhi

Web resources

- Introduction to Guidance and Counseling African Virtual university http://oer.avu.org/bitstream/handle/123456789/153/GUIDANCE%20AND%20COUNSELING.pdf?sequence=1
- Ethical Principles of Psychologists and Code of Conduct by APA, http://www.apa.org/ethics/code/principles.pdf
- Guidance and Counselling, http://www.ncert.nic.in/departments/nie/dse/activities/advisory_board/pdf/guidelines_for_guidance_and_counseling.pdf
- http://www.egyankosh.ac.in/

BSE VIII.7 :VALUE AND PEACE EDUCATION

Credits: 2 (1L+ 1T +0P) **Marks: 100**
Contact hrs per week: 3 **C1 + C2: 50**
Exam Duration: 2 hrs **C3: 50**

Objectives

The student teacher will be able to:

- Understand the need and importance of education for peace and values.
- Understand the nature, characteristics and types of human values.
- Understand the five core values of Truth, Righteous conduct, Peace, Love and Non-Violence.
- Appreciate the developments in Peace Education in India and Abroad.
- Understand various methods, techniques and approaches of value development.
- Appreciate the preamble to the constitution and values inherent in it.
- Understand various models of value education.
- Appreciate the importance of living together and imbibe in their attitude and behaviour.

COURSE CONTENT

Unit I: Concept, Meaning and Nature of Value

Concept and meaning of value and Peace:
Indian and Western perspectives on value and Peace.
Reflections of great Indian thinkers on values and Peace (Gandhiji, Swami Vivekananda, Sri Aurobindo, Rabindranatha Tagore, J. Krishmamurthi)
Understanding Peace in the individual, Social, National and International context
Nature and characteristics of values
Sources and selection of values -culture and human needs

Unit II : Concept, Meaning and Nature of Peace

Historical development of Peace education in India and in the world
Preamble to the Indian Constitution and values inherent in it
Exposition of the five human values of Truth, Righteous Conduct, Peace, Love and Non-Violence with illustrations from life and literature.
Creation of United Nations, UNESCO, UNICEF and their role in promoting value and Peace Education.
Judgement of the Supreme Court on Value Education

Unit III : Concept and need for Value-based Education and Education for Peace

Concept of value based education and Education for Peace with special reference to peace to Indian view of life;
Paradigm shift from Peace education to Education for Peace.
Need for and importance of value based education and Education for Peace in the present scenario.
Aims and objectives of value based and Peace education
Recommendations of Sri Prakasha Committee (1959) on value education.
Recommendations of Parliamentary Committee of HRD on Values Education (1996-90) headed by Shri S.B. Chauhan.

Curriculum development and Models of Value Education.

Models of value education; Rationale building model, the consideration model, valuing process and clarification model.
Curriculum development; State specific approach – Elementary, Secondary, Higher Secondary and Higher Education.
Integration of human values with all (school) academic subjects.

Unit IV :Pedagogy of Value Education and Education for Peace

- Approaches and Techniques of teaching human values:-
  Direct approach: value based Story-telling, Group activities (dramatization, literary activities, games and sports, service activities), Counselling, organizing value based co-curricular activities.

  Indirect Approach; Incidental Approach with illustrations

  Integrated approach: Integration into curricular, co-curricular activities and subjects (with illustrations of integration from Language, Mathematics, science and social science , art and aesthetics , Yoga and health education,
- Teacher as Role Model.
- Role of school ambience and environment in development of values.

Practicum

- Develop / compile stories with values from different sources and cultures, organize value based co-curricular activities in the classroom and outside the classroom, develop value based lesson plans, integrating values in school subjects.
- Study of any Model of integrated value education – case study of models expressed by Sri Sathya Sai, J. Krishnamurti, etc.
- Visit to Ramakrishna Institute of Moral and spiritual Education

In addition, school and community based activities may be organised.

Evaluation Strategies

1. Reflective reading based presentations.
2. Unit tests.
3. Quiz based evaluation
4. Seminar presentation
5. Submission of case reports on violation of peace as reported through mass-media.

References:

1. Barash, P. David (2000). Approaches to Peace, Oxford University Press, New York.
2. Bernard, Jessie (1957). The Sociological study of conflict. International Sociological Association, The Nature of Conflict, UNESCO Paris.
3. Galtung, J. (2003). Searching for Peace – The road to TRANSCEND, Sterling Virginia.
4. Galtung, Johan (1996). Peace by Peaceful Means: Peace and Conflict, Development and Civilization. Sage Publications, New Delhi.
5. Galtung, Johan (1984). The Struggle for Peace Gujarat Vidyapith, Ahmedabad.
6. Gandhi, M.K. (1944). Non-Violence in Peace and War Navajivan Publishing House, Ahmedabad.
7. Govt of India (1983). Report on Education in Human Values in Teacher Training Programmes, New Delhi, Ministry of Human Resource Development.
8. Harris Ian. M. (1998). "Peace Education" Mc Farland & Company, Inc Publisher London
9. Howlett, Charles F., John Dewey and Peace Education, Encyclopedia of Peace Education, Teacher College, Columbia University 2008.
10. Kapani, Madhu (2000). Education in Human Values – concept and practical implications, New Delhi; Sterling Publishers.
11. Krishnamurti, J.: "Total Freedom", Krishnamurti Foundation Chennai.

12. NCERT National Curriculum Framework (2005). Position Paper, National focus Group on Education for Peace, NCERT, New Delhi (2006).
13. National Curriculum Framework (2005) position paper, National Focus group on Education for Peace, NCERT, New Delhi.
14. NCTE (1998). Curriculum Framework for Quality Teacher Education, NCTE, New Delhi.
15. Pandey, S. (2004). Education for Peace, Self Instructional Package for Teacher Education, NCERT, New Delhi.
16. Sri Sathya Sai Bal Vikas Education Trust (1985). Curriculum and Methodology for integrating Human Values Education, Prashanthi Nilayam (International Education).
17. Sri Sathya Sai International Center for Human Values (2009). Education in Human Values: Course Book for Training of Master Trainers, New Delhi.
18. The Curriculum framework for Quality Teacher Education (1998) NCTE, New Delhi
19. UNESCO (2001) Learning the way of Peace, "A Teacher Guide to Education for Peace", UNESCO, New Delhi.

Web resources

Education for values in schools- a framework, NCERT
http://www.ncert.nic.in/pdf_files/Framework_educationCOMPLETEBOOK.pdf

Values Education A Handbook for Teachers (2012), CBSE
http://cbseacademic.in/web_material/ValueEdu/Value%20Education%20Kits.pdf

Position Paper National Focus Group on Education for Peace,
NCERT http://www.ncert.nic.in/new_ncert/ncert/rightside/links/pdf/focus_group/education_for_peace.pdf

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