REGULATIONS FOR
FOUR YEAR INTEGRATED B.Sc., B.Ed. &
B.A., B.Ed. DEGREE PROGRAMME
(SEMESTER)

[With effect from 2018-19]

PONDICHERRY UNIVERSITY
PUDUCHERRY - 605 014
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REGULATION
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PONDICHERRY UNIVERSITY
FOUR YEAR INTEGRATED PROGRAMME LEADING TO
B.Sc., B.Ed. / B.A., B.Ed. DEGREE
REGULATIONS (2018 – 19 onwards)

0.PREAMBLE:

The Four year integrated programme in Education – B.Sc., B.Ed. and B.A., B.Ed. aims at integrating the general studies comprising three year Liberal Science - B.Sc. and Liberal Arts - B.A. on the one hand and the Professional Studies B.Ed. comprising foundation of education, pedagogy of school subjects and practicum related to tasks and functions of a school teacher on other hand. It maintains a balance between theory and practice, and coherence and integration among the components of the programme, representing a wide knowledge base of a secondary school teacher. During the programme, the student-teacher shall be prepared for teaching up to class ten only but they shall automatically become eligible for teaching at senior/ higher secondary stage after they acquire post-graduation degree in a relevant subject. The Students who pass this programme will be eligible to pursue Masters’ Degree in the respective subject in Pondicherry University and in any other University recognised by UGC.

1. Duration and Working Days:

1.1 Duration

The B.Sc., B.Ed. and B.A., B.Ed. programmes shall be of four years (Eight Semesters) including school Based experiences and internship in teaching. Student teachers shall, however, be permitted to complete the programme within a maximum period of six years from the date of admission to the programme.

1.2 Working Days

a) There shall be at least two hundred and fifty (250) working days per year (120 – 130 days in each semester) excluding the period of admission and examination.

b) A working day will be of a minimum of 6 hours and 6 days in a week and adding up to a minimum of 36 hours per week. The institution shall ensure the availability of teachers and students for consultation and mentoring-providing group of individual guidance.

c) The minimum attendance of student teachers shall have to be 80% for all course work and practicum, and 90% for school internship.

2. Intake, Eligibility and Admission Procedures

2.1 Intake

There shall be a basic unit of (50) students. Initially two units (one unit each in B.Sc., B.Ed. and B.A., B.Ed. or Two units each either in B.Sc., B.Ed. or B.A., B.Ed.) may be permitted. The university may prescribe the distribution of students for different subjects based on the facilities available from the subjects listed below as per NCTE Regulations 2014

<table>
<thead>
<tr>
<th>Course</th>
<th>Subject of specialisation (Major / Main)</th>
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<tr>
<td>B.Sc., B.Ed.</td>
<td>Mathematics, Physics, Chemistry, Botany, Zoology, Computer Science</td>
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<tr>
<td>B.A., B.Ed.</td>
<td>English, Indian Language, History, Geography</td>
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</table>
2.2 Eligibility
(a) The candidates with at least 50% marks in the +2 or its equivalent are eligible for admission
(b) The reservation and relaxation in marks for SC/ST/OBC/PWD and other category shall be as per the rules of the Central Government / UT of Puducherry/UT of Andaman & Nicobar Islands.
(c) The choice of subject is based on the eligibility conditions as prescribed for the UG courses of the respective subject of specialisation by this university.

2.3 Admission Procedure
(a) Admission will be made on merit on the basis of marks obtained in the qualifying examination and in the entrance examination or any other selection process as per the policy of respective Government.

(b) At the time of admission to the programme, the students will need to indicate their selection of the subject to be pursued for the discipline options and accompanying pedagogic specialisation for which they are applying and these may be assigned on the basis of order of merit and availability

3. Eligibility for Admission to Examination
The university examination for the B.Sc., B.Ed. and B.A., B.Ed. programmes shall be of eight semesters (a minimum of 120 days to a maximum of 130 days per semester) including school based experiences and internship in teaching. A student teacher shall be admitted to the examination only if (i) he/she has undergone the prescribed course of study – both theory and practicum including school internship satisfactorily; and (ii) having put in not less than 80% of attendance for all course work and practicum and 90% of attendance for school internship in each year.

4. Course Structure
The four year integrated programme aims at integrating the general studies comprising B.Sc. in Mathematics, Physics, Chemistry, Botany, Zoology, Computer Science and B.A. in English, Indian Language, History, Geography disciplines on one hand and the Professional Studies B.Ed., comprising foundation of education, pedagogy of school subjects and practicum on the other hand relating to the task and functions of a school teacher. Hence the students shall have to study the content of the graduation level of their choice. In the professional segment, students shall study basics of education, different educational specializations having a direct bearing on teacher tasks, pedagogy of school subjects, undertake school experience, and conduct other practical activities.

The curriculum of the programme has been organized under the following four components:

<table>
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<th>1</th>
<th>Part I</th>
<th>Modern Indian Languages / French</th>
<th>Liberal Options (LO)</th>
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<td>Part II</td>
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<tr>
<td>3</td>
<td>AECC</td>
<td>Courses approved by UGC and MHRD</td>
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</table>

As stated earlier, the curriculum of the programme has been organized under two broad components, namely the professional component and the liberal component. The professional component is further divided into three categories, namely educational studies, pedagogical studies and practicum. The semester-wise detailed scheme of studies along with weightage for different courses are given below:
### SEMESTER WISE COURSE STRUCTURE

#### FIRST YEAR - SEMESTER I

<table>
<thead>
<tr>
<th>Title of the Course</th>
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<td>Lang II-1</td>
<td>English</td>
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<tr>
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### THIRD YEAR - SEMESTER VI

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<td><strong>Part IV</strong></td>
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5. Choice of Pedagogical School Subjects I & II

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### B.A., B.Ed.

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<td>3</td>
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<tr>
<td>4</td>
<td>Any Indian Language</td>
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6. Curriculum, Programme Implementation and Assessment

The programme comprises two broad curricular areas: **General studies** comprising science stream (B.Sc.) / social sciences or Humanities (B.A.) and **Professional studies (Education component)** comprising foundations of education, pedagogy of school subjects, and practicum related to the tasks and functions of a school teacher. The transaction of the courses, apart from lecture cum discussion may comprise of variety of approaches, case studies, reading of original writings, discussion on reflective journals, observations of children, and interaction with the community in different socio-cultural environments.

7. a. Task and Assignment related to theory courses in General studies (Courses in Liberal options)

#### Distribution of Marks for Liberal Courses

i. **THEORY**

- **Total:** 100 Marks, **Duration:** 3 hours
- **University Examination (UE):** 70 marks
- **Continuous Comprehensive Evaluation (CCE):** 30 marks

**Continuous Comprehensive Evaluation Structure:**

- **Test - 15 marks (3 tests – 3x5)**
- **Assignment / Practicals in Supportive courses - Science Subjects - 10 marks**
  
  (the list of the practicals - attached under the respective syllabi)
- **Attendance - 5 marks**

**Passing minimum for Continuous comprehensive evaluation - 12 marks (40%)**

**Passing minimum for University Examination - 28 marks (40%)**

The following weightage shall be given to attendance:

- 95% - 100% (5 marks)
- 90% - 94% (4 marks)
- 85% - 89% (3 marks)
- 80% - 84% (2 marks)
- 75% - 79% (1 mark)
ii. PRACTICALS
(Choose at least 5 experiment for each semester given in the LIST OF EXPERIMENTS in respective syllabus without overlap)

**Practical in main subjects - 50 marks**
- University Examination (UE) – 60 %
- Continuous Comprehensive Evaluation (CCE) – 40 %
  (Record notebook, Test, Regularity in record submission, Practical attendance)

b. Task and Assignment related to theory courses in professional studies

The curricular areas of ‘Perspectives in Education’ and ‘Curriculum and Pedagogic Studies’ shall offer field engagement through different tasks and projects with the community, the school, and the child in school and out-of-school, based on the practical activities listed in the respective syllabus for the theory courses. Continuous and Comprehensive Evaluation will be made based on submission of documentary evidences either by individual student or group work for each of the theory courses.

However, for each of the theory courses of the curricular area of ‘Curriculum and Pedagogic Studies’, the practical activities shall include practicing at least three teaching skills relevant to the pedagogical subject in Micro-teaching context during 5th or 6th semester. Similarly, for the course on “Assessment for Learning”, the practical activities shall include preparation, administration and interpretation of results of tests and different evaluation techniques in the 8th semester.

8. School Internship

i. School internship would be a part of the broad curricular area of ‘engagement with the field’ and shall be designed to lead to the development of a broad repertoire of perspectives, professional capacities, teacher sensibilities and skills.

ii. During internship in the fifth semester, student teacher shall spend 4 weeks, spread over several days throughout 5th Semester. This will include one week of school engagement making observation in the school and three weeks of other engagements as explained in the syllabus. The observation record and/or project report of the student teacher should be the base for awarding CCE marks by the faculty.

iii. During the sixth and seventh semester, out of 16 weeks of internship, student teachers will devote one week for observation of classes taken by regular school teachers (at least 5 lessons in each pedagogical subject). The student teachers will devote 15 weeks for classroom teaching which may be in one block or in two blocks, (in one or two different schools). However, the classroom teaching during internship shall be done at any two levels/stages of school. The internship must be both at upper primary (classes VI- VIII) and secondary (classes IX and X) levels. During the internship student teachers will also be engaged in making observation of classes taught by regular teacher (whenever possible) and the peer teachers.

iv. The internship should be in government-recognized schools under Government or private managements, situated within the radius of 40 km of the College of Education concerned for supervision by the faculty members of the college. The schools under CBSE or State / UT patterns can be the schools for internship.

v. The student teacher during internship in a school should perform the roles of a regular teacher at the respective level under the direct guidance and supervision of the mentoring teacher (Supervising / Guide Teacher) of the school. While at school, the student teacher shall prepare the necessary teaching resources and records for teaching lessons (duration of 45 minutes each).

vi. The total 60 lessons of classroom teaching in 15 weeks may be divided as 30 at level one (15 lessons for Pedagogical Subject I and 15 lessons for Pedagogical Subject II) and 30 at level two (15 lessons for Pedagogical Subject I and 15 lessons for Pedagogical Subject II). A few lessons may be ICT based depending on resources available in the practicing schools.
vii. During this period, (i) classroom teaching (ii) evaluation at the end of 15 lessons and (iii) diagnosis based feedback to the students should be completed by every student teacher.

9. Other practical activities related to community based engagement

A minimum of 5 days shall be spent for Community Living Camp to foster social skills and values among student teachers during the 5th semester.

10. Scheme of examination

**FIRST YEAR - SEMESTER I**

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<td></td>
<td>Edn : Int 2</td>
<td>Community Living Camp</td>
<td>-</td>
<td>50</td>
<td>-</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td>Edn: EPC 5</td>
<td>Soft Skill</td>
<td>-</td>
<td>50</td>
<td>-</td>
<td>50</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>800</strong></td>
</tr>
</tbody>
</table>

## THIRD YEAR - SEMESTER VI

<table>
<thead>
<tr>
<th>Part III</th>
<th>Title of the Course</th>
<th>Name of the course</th>
<th>Hours</th>
<th>CCE*</th>
<th>UE**</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Core 19</td>
<td>Core: B.Sc/B.A</td>
<td>3</td>
<td>30</td>
<td>70</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>Core 20</td>
<td>Core: B.Sc/B.A</td>
<td>3</td>
<td>30</td>
<td>70</td>
<td>100</td>
</tr>
<tr>
<td>Part IV</td>
<td>Edn 10: PE</td>
<td>Learning and Teaching – II</td>
<td>3</td>
<td>30</td>
<td>70</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>Edn 11: PE</td>
<td>Contemporary India and Education -II</td>
<td>3</td>
<td>30</td>
<td>70</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>Edn 12: PE</td>
<td>School Management – I</td>
<td>3</td>
<td>30</td>
<td>70</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>Edn 13: C&amp;PS</td>
<td>Pedagogy of School Subject I</td>
<td>3</td>
<td>30</td>
<td>70</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>Edn 14: C&amp;PS</td>
<td>Pedagogy of School Subject II</td>
<td>3</td>
<td>30</td>
<td>70</td>
<td>100</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>700</strong></td>
</tr>
</tbody>
</table>

## FOURTH YEAR - SEMESTER VII

<table>
<thead>
<tr>
<th>Part III</th>
<th>Title of the Course</th>
<th>Name of the course</th>
<th>Hours</th>
<th>CCE*</th>
<th>UE**</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Edn 15: PE</td>
<td>Creating an Inclusive School</td>
<td>3</td>
<td>30</td>
<td>70</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>Edn 16: C&amp;PS</td>
<td>Assessment for learning – I</td>
<td>3</td>
<td>30</td>
<td>70</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>Edn 17: PE</td>
<td>School Management – II</td>
<td>3</td>
<td>30</td>
<td>70</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>Edn 18: C&amp;PS</td>
<td>Pedagogy of School Subject I</td>
<td>3</td>
<td>30</td>
<td>70</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>Edn 19: C&amp;PS</td>
<td>Pedagogy of School Subject II</td>
<td>3</td>
<td>30</td>
<td>70</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>Edn: EPC 6</td>
<td>Yoga, Health and Physical Edn II</td>
<td>-</td>
<td>50</td>
<td>-</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td>Edn: EPC 7</td>
<td>Understanding Self</td>
<td>-</td>
<td>50</td>
<td>-</td>
<td>50</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>700</strong></td>
</tr>
</tbody>
</table>
11. Pattern of question paper for University Examination

Maximum Marks in the University Examination and duration: 70 marks – 3 hours

a. 2 questions of 10 marks each = 20 (Answer 2 Questions out of 4 with internal choice)
b. 6 questions of 5 marks each = 30 (Answer 6 Questions out of 10)
c. 10 questions of 2 marks each = 20 (Answer 10 Questions out of 10)

12. Distribution of marks for Continuous and Comprehensive Evaluation (CCE) for both general and professional studies.

(i) For theory courses:

The CCE weightage for continuous internal assessment tests and task & assignment projects should be equal i.e. 5 marks for a periodical test and 5 marks for a project. There should be at least three tests and three projects for a course.

(ii) For Courses on Enhancing Professional Capacities (EPC):

The following specialised courses are offered to enhance the professional capacities of student teachers.

Course EPC 1: Yoga, Health & Physical Education
Course EPC 2: Reading and Reflecting on Texts
Course EPC 3: Drama and Art in Education
Course EPC 4: Critical Understanding of ICT
Course EPC 5: Understanding the Self
Course EPC 6: Yoga, Health & Physical Education
Course EPC 7: Soft skill

The evaluation of student teachers for these courses shall be totally internal. The total of 50 marks allotted to each of the courses is assigned as follows.

➢ Periodical tests based on the prescribed syllabus (at least two) - 10 Marks
➢ Assessment based on at least 4 of the tasks and assignments listed under the course outline – 10 x 4 = 40.

(iii) For Teaching Competency (During School Internship):

The different aspects of practicum and weightage marks for each of the Pedagogical Subjects I and II. The total of 100 marks allotted is as follows
Teaching Competency (Planning and Performance) 50 Marks
Preparation of Teaching Resources, (Including ICT based) 20 Marks
Lesson observation record (Peer and Regular teacher) 10 Marks
Evaluation, Diagnosis and Remedial programme (Record) 20 Marks

13 a. Conducting of practical examination for general studies in science (B.Sc.)

As stated in 7.a.

13 b. Conducting of practical examination for professional studies

i. Based on the periodical assessment of the teaching competency and other practical aspects of the student teachers, the internal assessment marks will be assigned by the faculty of the concerned pedagogical subject. The consolidated CCE marks in the prescribed format will be sent to the university by the Principal of the college concerned before the commencement of the practical examination.

ii. On receipt of the CCE marks from any college of education, the University will make arrangement for conducting the practical examination by appointing the Board of Examiners.

iii. Board of examiners for practical examination consisting of one Convener and three examiners for one unit (50 student teachers) and one Convener and seven examiners for two units (100 student teachers) will be chosen from among the faculty members of the Colleges of Education/ University Department of Education from within and outside university jurisdiction who possess a minimum of five years of teaching experience at B.Ed./M.Ed. level. The Convener must be from among the Principals / Associate Professors of the Colleges of Education. The Principal of the respective College of Education will be the ex-officio member of the panel.

iv. The practical examination will be conducted for two to three days after the completion of internship in the 8th semester.

v. The practical examination should be conducted by two examiners acting as a pair and to assess the student teachers on following aspects of both pedagogical subjects:

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Aspects for Assessment</th>
<th>Marks</th>
</tr>
</thead>
<tbody>
<tr>
<td>A.</td>
<td>Assessment during practical examination:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Teaching Competencies (Planning and Performance)</td>
<td>50</td>
</tr>
<tr>
<td>B.</td>
<td>Assessment of record maintained during internship:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>i. Preparation of Teaching Resources (Including ICT based)</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>ii. Lesson Observation Record (Peer and Regular teacher)</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>iii. Lesson plans</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>iv. Evaluation and Remediation Record</td>
<td>10</td>
</tr>
<tr>
<td>C.</td>
<td>Viva – Voce</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

vi. The examiners should submit the marks separately to the convener and the board of examiners should consolidate the marks.

vii. The practical examination marks awarded by the individual examiners and the consolidated marks list should be submitted to the Controller of Examinations, Pondicherry University on the final day of the practical examination itself with the signatures of all the members.

viii. The faculty observer of the Pondicherry University shall be present during the practical examination.

ix. The practical examination for all student teachers shall be conducted in a recognised high / higher / senior secondary school and the verification of records in the concerned college.
14. Passing Minimum in Professional studies (Education Component)

i. Every student teacher should register for all the courses in the theory examination and practical examination in the first attempt.

ii. A student teacher shall be declared to have passed in the B.Sc., B.Ed./B.A., B.Ed Degree examination only if he/she has passed both the theory and practical examination.

iii. A student teacher shall be declared to have passed in the theory examination if he/she obtains a minimum of 45% marks both in External Examination (32 out of 70) and CCE (14 out of 30) and a total of 50 marks by combining both external (UE) and internal (CCE) examination in each course.

iv. A student teacher shall be declared to have passed the practical examination if he/she obtains a minimum of 45% marks in the pedagogical subject and in each of other aspects of practical examination mentioned above and 50% marks by combining all the aspects taken together.

v. A student teacher who fails in one or more courses in the theory examination in general studies and professional studies shall reappear in those course(s). But the one who fails in any one of the aspects of the practical examination shall reappear for all aspects.

vi. The integrated B.Sc., B.Ed./B.A., B.Ed. degree programme should be completed by the student teachers in not more than 6 years from the date of admission to the programme.

15. Classification of successful candidates

The successful student teachers shall be classified in Part I, Part II, Part III and Part IV separately as follows.

<table>
<thead>
<tr>
<th>SUBJECTS</th>
<th>FIRST CLASS</th>
<th>SECOND CLASS</th>
<th>THIRD CLASS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Part I – Any Indian Language / French</td>
<td>60% and above</td>
<td>50% and above but less than 60%</td>
<td>Pass but less than 50%</td>
</tr>
<tr>
<td>Part II – English</td>
<td>60% and above</td>
<td>50% and above but less than 60%</td>
<td>Pass but less than 50%</td>
</tr>
<tr>
<td>Part III – Main + Supportive subjects</td>
<td>60% and above</td>
<td>50% and above but less than 60%</td>
<td>Pass but less than 50%</td>
</tr>
<tr>
<td>Part IV – Education Component</td>
<td>60% and above</td>
<td>50% and above but less than 60%</td>
<td>Not Applicable</td>
</tr>
</tbody>
</table>

The same should be mentioned in the Degree certificate awarded by the University as detailed below

- Part I – Language .......................... Class
- Part II – English ........................... Class
- Part III – Main subject ..................... Class
- Part IV – Education ........................ Class
B.Sc., B.Ed.
&
B.A., B.Ed.

DEGREE PROGRAMME

SYLLABUS
PART I

MODERN INDIAN LANGUAGE

(Tamil, French, Malayalam, Telugu, Hindi)
PONDICHERRY UNIVERSITY

Part I - TAMIL
(4 Semesters – Tamil-I, Tamil-II, Tamil-III & Tamil-IV),

LANGUAGE COURSE FOR B.Sc.B.Ed.& B.A.B.Ed.

1st YEAR

1st SEMESTER

தமிழ்: தமிழ் – I

Title of the Paper: TAMIL I

பராங்கியம் (Syllabus)

1. பாடல்முறைம - மாற்றும் பாடல்முறை
2. தோண்டாம் முயற்சி - கல் முயற்சி அவைகளைப் பிரித்தான்
3. தமிழ்சீவு ஓர் ஓராலும் குழாய் - பாடல்கள் பராங்கியம்
4. முகலம் ஓர்பெருமா - கல் பாடல்கள் மாற்றமானால்
5. தமிழ் சங்ககாலம் - கல் சங்ககாலம்
6. சங்காலம் - கல் சங்காலம்
7. தமிழ் ஓர்பெருமா - கல் ஓர்பெருமா
8. இறைவன் - கல் இறைவன்
9. நிறுவனம்: ஓர்பெருமா - கல் ஓர்பெருமா
10. கல்வியியல்: புனைவையும் - கல்வியியல்
தற்போதை தேசிய அரசு

1. மாணவர் - முற்பத்திய

2. மாணவியர் - மாணவியர்

3. அவர்கள் - அ. அவர்கள்

4. அவர்கள் பணியாளர் - பணியாளர் அவர்கள்

5. இலக்க நிகழ்வு - நிகழ்வு

தற்போதை குழுமம்

1. அவர்கள் - அவர்கள்

2. எட்டு முறும் பிள்ளை குழு - முற்பத்திய

இப்பகுதி வருகை

பல்கலைக் கழகம்: உயிரியல், புத்தகாலி, நூற்கை, பியானோ, புராண பத்தியினர் குறிப்பிட்டு பல்கலைக் கழகம்

புதைய குழுவின் நோக்கம்:

பல்கலைக் கழகம் - குழுக்கை குழு - குழு (பல்கலைக் கழகம் பதவிய பாடகர்)
புதைய பதவிய குழு குழுமம், புதைய - 2015

************
IInd SEMESTER

தமிழ்: சிற்றிய - II

Title of the Paper: TAMIL II

பாட்டியல் (Syllabus)

அமர்த்தத்திலிருந்து:

1. வியாயத் (30 ஆண்டுப்பாடுகள்)
   கதாபாத்தியம்
   வல்லுநருகிலிலியின்
   தமிழ்

2. வரவுக்குறித்து (10 பாடல்கள்)
   பாரிப்பத்தியம் விளக்கப்படும்

3. முரும்பர் (9 பாடல்கள்)
   விளக்கப்படும்

4. சுருக்கின்னை (5 பாடல்கள்)
   பாடல் ரீதை: 1, 2, 4, 95, 26

5. வாழ்க்கை (5 பாடல்கள்)
   பாடல் ரீதை: 1, 4, 17, 26, 27

நடைபெற்றதான்:

6. சிறப்புக்குறித்து - பாரிப்பத்தியம் விளக்கப்படும்

7. சிறப்புக்குறித்து - வாழ்க்கையின் விளக்கப்படும்
   (இடைநிலைப்படி பாடல்கள்)
8. குறிப்பிட்டு குறிப்பிட்டு மூலமாக - மூட முது 
பெற்று அழுத்தி மேற்கருமான் பாடல் 
அண்டதால் 103-112 வரை 10 மாண்டுகள்

9. மேலே பதிவுக்காக - 
மேலே பதிவுக்காக 

10. தொடர்புப்பதிவு - 
தொடர்புப்பதிவு 

11. திருநாள் குறிப்பிட்டு - 
மேலே பதிவு

உருசிய பங்களிப்பு

12. குறிப்பிட்டு - 
குறிப்பிட்டு

13. ஊருக்கு குறிப்பிட்டு - 
ஆரம்பத்தாக தொடர்பு பதிவு

14. பல நாடுகள் கார்பனை - 
பல நாடுகள் கார்பனை

15. முன்னாட்சி பதிவு - 
முன்னாட்சி பதிவு

16. புதுக்கால பதிவு? அம்பப் பரம்பரை? - 
புதுக்கால பதிவு

சிற்றுருசிய பங்களிப்பு

அது சிற்றுருசிய பங்களிப்பு, குறிப்பிட்டு குறிப்பிட்டு, தொடர்பு 
சிற்றுருசிய பங்களிப்பு

பதிலிபத்தில் விளக்கம் பதிவு:

பதிலிபத்தில் விளக்கம் - பதிலிபத்தில் - விளக்கம் (வேட்டாது அறிவியல் இளவரசராகப் பாடும் பாடல் 
பொறுப்பு, புதுக்கால பதிவு) (2015)

************
2nd YEAR
IIIrd SEMESTER

Title of the Paper: TAMIL III

பாலக்கிரும் (Syllabus)

1. மேற்குறிப்பிட்டுதல் - மேற்குறிப்பிட்டுதல் (புது 10 மாண்டுகள்)
2. தொடர்கூற்றுப்பாடுதல் - தொடர்கூற்றுப்பாடுதல் (புது 10 மாண்டுகள்)
3. பாரம்பரியால் கிளைகொள்க - காரணத்தின் விளக்கங்கள் (புது 10 மாண்டுகள்)
4. விமான வாக் - விமானவாக் (புது 10 மாண்டுகள்)
5. கிழான்முகம் - கிழான்முகம் (புது 10 மாண்டுகள்)
6. தொடர்கூறுப்பு - தொடர்கூறுப்பு (10 மாண்டுகள்)
7. விளக்கத்தின் வருமாக்கியால் - விளக்கத்தின் வருமாக்கியால் (மறு மூலம் 12 மாண்டுகள்)
8. தொடர்பு வலிச்சீல் தொடர்பு - வலிச்சீல் தொடர்பு (10 கால்நடைகள்)
9. பட்டைத்துப்பு (புது 10 மாண்டுகள்)
10. நூறு முறை கூறு - 71 புது 90 முறை (20 கால்நடைகள்)

திறந்தை உரையாடு

பாலக்கிரும் கிளைகொள்கிரும் திறந்தை உரையாடு

பாலக்கிரும் நூறுத் துறை:

பாலக்கிரும் துறை - கிளைகொள்கிரும் துறை (புது 10 மாண்டுகள்) பெருந்தொடர் புது 90 முறை (2014-2015 முறை)
IVth SEMESTER

Title of the Paper: TAMIL IV

 Maarதும் (Syllabus)

1. வேளாத்மாக வகைப்பாடு

1.1 குறிப்பிட்டும்

முப்பதாரை வகைப்பாடு

பாடல் எண்கள்: 35, 155, 191, 215, 263

1.2 சுருக்கமிகுற்றும்

முப்பதாரை வகைப்பாடு

பாடல் எண்கள்: 2, 17, 18, 360, 379

1.3 வேளாத்மாக வகைப்பாடு

முப்பதாரை வகைப்பாடு - இருபத்துறைக் வகைப்பாடு

பாடல் பாடல்கள் (31 – 40)

1.4 பிழைத்தேக்கம்

திருச்சோழ பாடல் - 20 அடி பாடல்

அசாரு பாடல் - 61 அடி பாடல்

அசாரு பாடல் - 72 அடி பாடல்

1.5 பாணிபாடல்

துங்கையுருக்காட்டி - 9 அடி பாடல்

காந்து - கும்ப சார்பாடல், 1 - 26 அடி பாடல்

1.6 வழக்கிட்டும்

பாடல்கள்: 1, 8, 10
1.7 குறிப்பிட்டல்

காலி முழு மாணவர்கள், வலு 84 - 111

1.8 புதுக்கால்

மாணவர்கள்: 74, 95, 106, 107, 188, 189, 192, 204, 212, 312

1.9 முடிவுக்கால் ப்லா TN

1.10 கல்விச் சாய்தியம் பராமரிப்பு

பாடல்போர் கல்விச் சாய்தியம்

வளர்ந்த பாடல்போர்

1. அரசே, பிராமி, பாண்டியனே, மலர், நூறியன் அறிவியல் விளையாடும் முனிகள்
2. கொண்டுதவு அறிவியல் பரங்கிய விளையாட்டின் - முயற்சி பாட்டு அறிக்கை
3. கொண்டுதவு விளையாட்டின், கொண்டுதவு விளையாட்டின், கொண்டுதவு விளையாட்டின் பரங்கிய விளையாட்டின் -
   முயற்சியாக பாட்டு அறிக்கை
4. விளையாட்டின் - முயற்சி விளையாட்டின், கல்விச் சாய்தியம் அறிவியலியல் விளையாட்டின், கல்விச் சாய்தியம்
   விளையாட்டின் பரங்கிய விளையாட்டின்

அதிசயம் அறிவியலியல்

அம்பா - ஆமா - அம்பா - ஆமா வாணவ குறிப்பிட்டல்

சலப்பா ஆவியலியல்

அம்பா - ஆமா - ஆமா வாணவ குறிப்பிட்டல் முறை பன்னாட்டு

அதிசயம் பாடல்போர் - மாணவர் பாடல்போர் குறிப்பிட்டல்

பாடல்போர் நிகழ்வுப் பங்களி:

பாடல்போர் நிகழ்வு - குறிப்பிட்டல் - குறிப்பிட்டல் (பொலிகாக்கம் மாணவர் பண்பாடு மற்றும்
   பண்பாடு பண்பாடுத்தல், புதுக்கால் (2014-2015 முறை)

************
PONDICHERRY UNIVERSITY

Part I - FRENCH

(4 Semesters – French-I, French-II, French-III & French-IV),

LANGUAGE COURSE FOR B.Sc.B.Ed. & B.A.B.Ed.

FIRST YEAR -- I SEMESTER

Language French – I :

Prescribed Textbook: FESTIVAL 1 - Méthode de Français

Authors: Sylvie POISSON-QUINTON
         Michèle MAHEO-LE COADIC
         Anne VERGNE-SIRIEYS


Portions: Unités : 1, 2, 3.

FIRST YEAR -- II SEMESTER

Language French – II :

Prescribed Textbook: FESTIVAL 1 - Méthode de Français

Authors: Sylvie POISSON-QUINTON
         Michèle MAHEO-LE COADIC
         Anne VERGNE-SIRIEYS


Portions: Unités : 4,5,6.
SECOND YEAR – III SEMESTER

Language French – III:

Prescribed Textbook: *FESTIVAL 2 – Méthode de Français*

Authors: Sylvie POISSON-QUINTON
          Michèle MAHEO-LE COADIC
          Anne VERGNE-SIRIEYS


Portions: Unités: 1, 2, 3.

SECOND YEAR – IV SEMESTER

Language French – IV:

Prescribed Textbook: *FESTIVAL 2 – Méthode de Français*

Authors: Sylvie POISSON-QUINTON
          Michèle MAHEO-LE COADIC
          Anne VERGNE-SIRIEYS


Portions: Unités: 4, 5, 6.
PONDICHERY UNIVERSITY

Part I - MALAYALAM
(4 Semesters – Malayalam-I, Malayalam-II, Malayalam-III & Malayalam-IV),

**LANGUAGE COURSE FOR B.Sc.B.Ed & B.A.B.Ed.**

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Semester-1

കവിത-ശാസ്ത്രം

മലയാളകവിത ശാസ്ത്രത്തിൽ കുറഞ്ഞ ഒരുക്കുന്നത് അന്താരാഷ്ട്ര സ്ത്രീളാണ് പഠിക്കുന്നത് മലയാളകവിതയിൽ ഉണ്ടായ ഭാവപരിണാമം പരിചയം. ഒരു കവിത-ശാസ്ത്രം പ്രവർത്തിക്കുന്നത് ശില്പശാസ്ത്രം തുറന്നു എന്ന് പ്രകാശിപ്പിക്കുന്നു.

പാഠഭാഗം 1. എം. കാമാൻ, എ. അഥവാ എന്നിവരുടെ പ്രകാശനം
പാഠഭാഗം 2. എ. എം. കാമാൻ, എ. അഥവാ എന്നിവരുടെ പ്രകാശനം

പാഠഭാഗം 3. എൻ. എ. തുടക്കം - പഠിക്കുന്നത്

മലയാളകവിതാസാഹിതി-വിശദപഠന

Semester 2

കവിത-ശാസ്ത്രം

മലയാളകവിത ശാസ്ത്രം കുറഞ്ഞ ഒരുക്കുന്നത് അന്താരാഷ്ട്ര സ്ത്രീളാണ് പഠിക്കുന്നത് മലയാളകവിതയിൽ ഉണ്ടായ ഭാവപരിണാമം പരിചയം. ഒരു കവിത-ശാസ്ത്രം പ്രവർത്തിക്കുന്നത് ശില്പശാസ്ത്രം തുറന്നു എന്ന് പ്രകാശിപ്പിക്കുന്നു.

പാഠഭാഗം 1. എ. എം. കാമാൻ, എ. അഥവാ എന്നിവരുടെ പ്രകാശനം

MIL_11
Semester 3

ഗദ·സാഹിത്യം

അവദേശ്യസേന്തകാരണത്തിന്റെ നിയമങ്ങൾ ആധിപത്യ ഭാരമായി കാഴ്ച്ചട്ടം നിർകുളക്കുന്നതില്ല, ഭരണപഠനമായ അവധിപത്യാലാപണം പ്രദർശിപ്പിക്കുന്നു. ഭരണം, അവധി ഭാരമായി, അവരകെ അവധിപത്യാലാപണങ്ങൾ ഭരണപഠനങ്ങളുടെ ഉദ്ദേശ്യത്തിൽ നിന്നും നടത്തിയ വിഭാഗങ്ങളുടെ താൽക്കാലിക പരിവർത്തനത്തെ പഠനത്തെ ആശയാലാപനങ്ങൾ ഉപയോഗിക്കുന്നു. പഠനത്തെ ആശയാലാപനങ്ങൾ മണ്ഡലാധിശിലായി, അവധിറിവിന്റെ വശത്തേക്കാണ് ഫലിതമായി.

1. എന്. ഓസ്റ്റക്‌ - സാഹിത്യശാസ്ത്രജ്ഞ
2. എന്. ബി. തെന്തരാ - സാഹിത്യശാസ്ത്രജ്ഞ
3. ഗ്ര. വി. കാർക്ക് - സാഹിത്യശാസ്ത്രജ്ഞ
4. എൻ. എ. മൌലിക - സാഹിത്യശാസ്ത്രജ്ഞ
5. എന്. ഓട് - അപേക്ഷിച്ച സാഹിത്യശാസ്ത്രജ്ഞ
6. മുൻഭാഗം അഭിഭാഷണം - കഥാ നിയമത്തിന്റെ, എന്നാൽ മൂന്നാം പദ്ധതി, പ്ലാന്റ് കുസോളം, 1996.
7. എ. എ. വി. - ചെറിയ കഥാനിർമ്മാണമാണ്
9. എന്. രാജീ, കാർക്ക് അഭിഷേകം - എന്നാൽ സാഹിത്യശാസ്ത്രജ്ഞശാസ്ത്രജ്ഞായി എന്നാൽ പുനരോതമാട്ടം, ഇന്ത്യയിലെ തെന്നേ, കിഴക്കു മുന്നൂർ, 2006
10. ഓട്, കുറിപ്പുകൾ, താപ്തുകൾ: പഠനം, പർവ്വം, മലയാളം അന്ത്യ മാസം, മാസം, 2015

ഒബ്ലേറ്റന്റുകളുടെ പരിവാഹനത്തിന്റെ സംഘടനയിലെ പുനരുതീരേണ്ട സ്ഥാനം തിരിച്ചറിഞ്ഞു.
Semester 4

സുബഹിലാസാന്യനിത്യ

സുബഹിലാസാന്യനിത്യ ഉദ്ദേശ്യം ആസ്വദിക്കുന്നു. പരാമർശം നല്ലാണെങ്കിലും പഠനത്തെ ആശ്രയിക്കുന്നു. ആരംഭിക്കുന്നത് നിരേണ്ടത് നിലവിലാണ്.

1. ഓൾ നാടകം - മാർലോറൺ ഓഡോൺ നിർമ്മാണ
2. പി. എസ്. ടോയ്സ് - സ്മാരക ഗാനം

ഒരുക്കിയിട്ടുള്ള ഇന്ത്യനേക്ഷണ പ്രക്ഷേപണമാണ്:

- ക്കെൽവേക്കനിത്യ - നാടകാസാഹിതി
- ചില്ലാസിൽ - മലയാളാംശനാടകസാഹിതി
PONDICHERRY UNIVERSITY

Part I - TELUGU
(4 Semesters – Telugu -I, Telugu -II, Telugu -III & Telugu -IV),

**LANGUAGE COURSE FOR B.Sc.B.Ed.& B.A.B.Ed.**

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పిల్లె వివిధాలు (Old Poetry)

1. కొడు చవితెను చర్చ - నాయికలు

(ఓలా మానవుడాలు - అందానం - గిరిజనుడు 121 మంది మాత్రమే 125 మంది మిశ్రము)

2. సాధన విచ్యాతి కాము - విపుల

(ఓలా మానవుడాలు - కొడు చవితెను చర్చ - ప్రాచీనాహిరికం 100కొడు మాత్రమే 125కొడు మిశ్రము)

మూడవ రింగు (Modern Poetry)

3. నీటి - కరారుడు జమ్ము

4. నీరిలియు - పిండి

చేవులు

5. ముగు తుంగి - ప్రమాద కంటాత

6. సర్వసంచారం - తిరిగి రాళ్ళకు పంచి

పాటుపేట

7. సందర్శనां

పుస్తకపాత, ప్యాన్, నాటకం, చిత్రాలింగం, గాయకము, అయోధ్య, అర్ధాచారం,

8. సంపాదన

చిత్రాలింగం, నాటకమూలం, ప్యాన్, ప్యాన్, రాళ్ళకు పంచి

9. సంస్మరణం

సంస్మరణ సమాచారం సంస్మరణ సమాచారం.
II Semester

TELUGU - II
Old Poetry, Modern Poetry, Short Stories & Novel

ఎంపు చేసండం

1. స్వామివిడీ రావు - తాళ్ళం

(తుర్వాతి సామర్థుత్లబ్ధ దయచేసినవా - 109వ కార్యకారి 82వ కార్యకారి 139వ కార్యకారి మాత్రం)

2. కాంచిరాయ తిరిగొడ్డం - తిరిగొడ్డం నిశాచర్య

(చిత్రానికి సంబంధం - 35 ఏడాది - 93వ కార్యకారి మాత్రం 139వ కార్యకారి మాత్రం)

ఎంపిక చేసండం

3. హదితి చిత్ర - హదితి చిత్రం

(మొత్తం సంఖ్య 82వుడు "అంగంసమ్మత సిద్ధాంతం మరియు సంశోధన నిర్వహణ" కార్యకారి 82వ కార్యకారి "అంగంసమ్మత సిద్ధాంతం మరియు సంశోధన నిర్వహణ" మాత్రం)

4. రామ - రామం కార్యకారి

(చిత్రానికి సంబంధం - 82వ కార్యకారి మాత్రం)

సంవత్సరం

5. అంగంసమ్మత కార్య - చిత్రానికి సంబంధం

6. అంగంసమ్మత ప్రభుత్వం? - చిత్రానికి సంబంధం

చిత్రం

7. "అంగంసమ్మత" - చిత్రానికి సంబంధం
III Semester
TELUGU - III
Old Poetry, Modern Poetry, Prose & Grammar

ప్రామాణిక సంహారం
1. చిత్రాయణం - దారాం
   (చిత్రాయితుల లోపం - చిత్రాయితుల లోపం 582వ వంతు లోపం 621వ వంతు లోపం)
2. కాలాహార ప్యాజమ - కాలాహార గ్రామ ప్యాజమ
   (మధుర ప్యాజమ 115వ వంతు లోపం 165వ వంతు లోపం)

ముఖ్య రిస్మాలు
3. సాధ్యం పండుళ్ళ - సాధ్యం పండుళ్ళ (1వ వంతు లోపం 20వ వంతు లోపం)
4. ప్రస్తావన ప్యాజమ - ప్రస్తావన ప్యాజమ (మనస్తాత్రి ప్యాజమ లోపం)

సాంస్కృతికాంధ్రం (సంస్కృత సంస్కృతం)
5. రామాయణం - రామాయణం సంస్కృత రిస్మాలు
6. మహాభారతం - మహాభారతం రిస్మాలు

ప్రామాణిక ప్యాజమలు
7. ప్రామాణికం - ప్రామాణికం, సహస్రమాతి, జాతిప్యం, మాండిప్యం, మాండిప్యం, మాండిప్యం, సహస్రమాతి, జాతిప్యం, మాండిపూర్ణం.
8. ప్రామాణికం - రామాయణం, రామాయణం, అనంతాయామి, అనంతాయామి, అనంతాయామి, అనంతాయామి.

భాషా ఇతరికలు
1. రామాయణం, భాగవత, సమాధాన, సమాధాన, సమాధాన, సమాధాన, సమాధాన, సమాధాన
2. మహాభారతం మిత్ర ప్రతి మిత్ర ప్రతి మిత్ర ప్రతి మిత్ర ప్రతి మిత్ర
3. అంధాపాడిని సంపాదించడం సంపాదించడం సంపాదించడం సంపాదించడం సంపాదించడం

IV Semester
TELUGU - IV
Classical Drama & Non - Detail

1. ప్రామాణికం - ప్రామాణికం ప్రతి ప్రతి ప్రతి ప్రతి ప్రతి
2. మహాభారతం - మహాభారతం ప్రతి ప్రతి ప్రతి ప్రతి

MIL_17
Prescribed Text Books and Reference Books

Prescribed Text Books and Reference Books for the above Syllabus

I Semester

 Publisher: [name], 9-4-95, address, tel., e-mail.

II Semester

 Publisher: [name], 9-4-95, address, tel., e-mail.

III Semester

 Publisher: [name], 9-4-95, address, tel., e-mail.

IV Semester

 Publisher: [name], 32-13/2 - 32, address, tel., e-mail.

Reference books:

 Publisher: [name], address, tel., e-mail.

Publisher: [name], address, tel., e-mail.

Publisher: [name], address, tel., e-mail.
PONDICHERY UNIVERSITY

Part I - HINDI
(4 Semesters – Hindi-I, Hindi-II, Hindi-III & Hindi-IV),

LANGUAGE COURSE FOR B.Sc.B.Ed.& B.A.B.Ed.

I SEMESTER – PAPER-I   सामान्य हिंदी - I
II SEMESTER – PAPER – II सामान्य हिंदी – II

III SEMESTER – PAPER – III सामान्य हिंदी – III
IV SEMESTER – PAPER – IV सामान्य हिंदी – IV
1st Semester

Paper-I सामान्य हिंदी-I

पाठ्य विषय

• उपन्यास
  ‘निर्मला’ - प्रेमचंद, राजकमल प्रकाशन, दिल्ली

• हिंदी अपठित
  पन्नुवार
  पत्रांक
  अनुवाद: अनुवाद की परिभाषा, अनुवाद का महत्व, अनुवाद की योग्यताएं, अनुवाद के प्रकार और प्रक्रिया
  पारिभाषिक शब्दावली (कार्यालयी शब्दावली)
  हिंदी में पदनाम
  कंप्यूटर में हिंदी का अनुवाद: प्रारम्भिक परिचय

अंकबिभाजन: पूर्णांक 100

| व्याख्यां (निर्मित उपन्यास) | 4 में से 2 | 2 x 7 ½ = 15 अंक |
| आलोचनात्मक प्रश्न (निर्मित उपन्यास) | 2 में से 1 | 1 x 15 = 15 अंक |
| लघुतरी प्रश्न (निर्मित उपन्यास) | 4 में से 2 | 2 x 5 = 10 अंक |
| पन्नुवार | 2 में से 1 | 1 x 10 = 10 अंक |
| पत्रांकन | 2 में से 1 | 1 x 15 = 15 अंक |
| लघुतरी प्रश्न (अनुवाद) | 5 में से 3 | 3 x 5 = 15 अंक |
| लघुतरी प्रश्न (कंप्यूटर) | 4 में से 2 | 2 x 5 = 10 अंक |
| पारिभाषिक शब्दावली | 15 में से 10 10 x 1 = 10 अंक |

अध्ययन के लिए सहायक पुस्तकें

• सामान्य हिंदी, डॉ. बिजयपाल सिंह, हिंदी प्रचार संस्थान, वाराणसी
• व्याख्यातार्किक हिंदी, डॉ. महेन्द्र मित्तल, शब्दरी संस्थान, दिल्ली
• हिंदी संक्षेपण, पन्नुवार और पत्रांक, डॉ. हरदेर बाहरी, अभिव्यक्ति प्रकाशन, हल्दिहाबाद
• प्रयोजन मूलतः हिंदी, विनोद गोदरे, बाणी प्रकाशन, दिल्ली
• प्रेमचंद और उनका युग, रामचंद्र शर्मा, राजकमल प्रकाशन, दिल्ली
• प्रेमचंद के उपन्यासों का शिल्प विज्ञान, कमलकिशोर गोपनकक्ष, सरस्वती प्रेस, दिल्ली
• संशोधन कैसे करें, डॉ. शेखरद्राह श्रीवास्तव, भारतीय पालन, पटना
II Semester

Paper-II - सामाजिक हिंदी- II

पाठ्य विषय

नाटक:

- अंधेर नगरी - भारतेंद्र हरिश्चंद्र
- मुहावरे - लोककथियाँ
- शब्द शुद्धि, वाक्य शुद्धि
- शब्दांश: पर्याय, बिलोम, अनेकार्थी, समाशुद्ध
- अनेक शब्दों के लिए एक शब्द
- देवनागरी लिपि की विशेषताएँ
- देवनागरी लिपि एवं वर्तनी का मानक रूप

संशोधन

हिंदी में संशोधनकरण

अंकविभाजन : पूर्णांक 100

| व्याख्याएँ (अंधेर नगरी) | 4 में से 2 | 2 x 7 ½ = 15 अंक |
| आलोचनात्मक प्रश्न (अंधेर नगरी) | 2 में से 1 | 1 x 15 = 15 अंक |
| लघुतरी प्रश्न (अंधेर नगरी) | 4 में से 2 | 2 x 5 = 10 अंक |
| मुहावरे लोककथियाँ | 10 में से 5 | 5 x 2 = 10 अंक |
| शब्द शुद्धि (10 शब्द) | 10 x ½ = 5 अंक |
| वाक्य शुद्धि (5 वाक्य) | 5 x 1 = 5 अंक |
| अनेक शब्द के लिए एक शब्द | 8 में से 5 | 5 x 1 = 5 अंक |
| शब्द जान (पर्याय, बिलोम, अनेकार्थी, समाशुद्ध) | 15 x 1 = 15 अंक |
| लघुतरी प्रश्न (देवनागरी लिपि) | 4 में से 2 | 2 x 5 = 10 अंक |
| संशोधन | 1 x 10 = 10 अंक |

अभ्यास के लिए सहायक पुस्तकें:

- व्याबहारिक हिंदी व्याकरण, तनसुखराम गुप्ता, हिंदी पुस्तक भवन, दिल्ली
- हिंदी संशोधन, पल्लवन और पाठ बोधन, डॉ. हरदेव बाहरी, अभिव्यक्ति प्रकाशन, इलाहाबाद
- हिंदी भाषा और देवनागरी लिपि - धीरेन्द्र बर्मा, हिंदुस्तानी एकेडमी, इलाहाबाद
- सामाजिक हिंदी, डॉ. बिजयपाल सिंह, हिंदी प्रचारक संस्थान, बाराणसी
- समकालीन हिंदी नाटक और रंगमंच चक्र पथ, भारती भाषा प्रकाशन, दिल्ली
- आधुनिक नाटकों का मरीज, मोहन राकेश, डॉ. गोविन्द चाकर, इंद्रप्रस्थ प्रकाशन, दिल्ली
- शृंखला हिंदी कैसे लिखें – राजेन्द्र प्रसाद, भारती भवन, पाड़ना
3rd Semester

Paper-III

पाठ्य विषय :-
1. गद्य गाथा (संपादक बीणा अग्रवाल, अरुणोदय प्रकाशन, दरियागंज, नई दिल्ली)
   • ममता – जयशंकर प्रसाद,
   • युवकों का समाज में स्थान –आचार्य नरेंद्र देव
   • नेता नहीं, नागरिक चाहिए – रामधारी सिंह ‘दिनकर’
   • मेरी जनमभूमि- हजारी प्रसाद दिवेदी
   • होली और औषधम – डॉ. एन.ई.विधवानाथ अय्यर
   • सरसू बेिा – रामबुझ बेनीपुरी
   • सदाचार का तात्त्विक – हरिशंकर परसाई
   • स्वामी दयानंद – मोहन राकेश
   • पहाड़ी रिक्शा – कल्हैटालाल सिंह ‘प्रभाकर’
   • इलाहाबाद – डॉ. लक्ष्मण सिंह विष्ट ‘बटरोटी’
   • शति : सबसे मुन्न घड़ – गुणाकर मुले

2. हिंदी भाषा और उसके विविध रूप
   • राजमहांश
   • राज़मारा
   • सम्प्रदाय भाषा
   • मीडिया की भाषा

अंकविभाजन : पूर्णक 100

<table>
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<tr>
<th>व्याख्याएँ (गद्य गाथा)</th>
<th>6 में से 3</th>
<th>3 x10 = 30 अंक</th>
</tr>
</thead>
<tbody>
<tr>
<td>आलोचनात्मक प्रश्न (गद्य गाथा)</td>
<td>4 में से 2</td>
<td>2 x 15 = 30 अंक</td>
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<td>लघुतरी प्रश्न (गद्य गाथा)</td>
<td>8 में से 4</td>
<td>4 x 5 = 20 अंक</td>
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<td>लघुतरी प्रश्न (हिंदी भाषा और उसके विविध रूप)</td>
<td>8 में से 4</td>
<td>4 x 5 = 20 अंक</td>
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अध्ययन के लिए तहायक पुस्तकें

- काव्य के रूप, गुलाब राय, आत्माराम एण्ड संस कथित क़बीरी गेट, दिल्ली
- साहित्य रूप, रामजान दिवेदी, भारती भण्डार, इलाहाबाद
- प्रयोजनमूलक हिंदी:सिद्धांत और प्रयोग, दंगल ब्लाट, बाणी प्रकाशन, दिल्ली
- कामकाजी हिंदी, डॉ. फैलशाङ्कर भाटिया, तथाशिला प्रकाशन, दिल्ली
- व्याख्यात्मक हिंदी, दिलीप सिंह, नेशनल पब्लिशिंग हाउस, दिल्ली
4th Semester

पाठ्य विषय

‘काव्य सुप्रमा’ - सम्पा. सत्यकाम विद्यालंकार, प्रकाशक तथा साहित्य, कल्याणी गेट, दिल्ली (केवल निस्त्रितिक कवियों / कविताओं पर ही व्याख्यातमक/आलोचनात्मक एवं लघुतरी प्रश्न पूछें जायेंगे)
कवीर - प्रथम 5 दोहे तथा पद संख्या 1
मूदम - पद संख्या 2 तथा 4
तुलसीदास - पद संख्या 1एवं 2 तथा 4
विद्यार्थी - दोहा संख्या 1, 3, 6, 10 तथा 11
मैथिलीशरण गुप्त - ‘रञ्जनाल की मार्ग’
जयशंकर प्रसाद - ‘आयु’
सुभाषिनी नंद - ‘बम्बत’
सूर्यकांत त्रिपाठी निराला - ‘जागो फिर एक बार’
रामधारी सिंह दिनकर - हिमालय के प्रति’
अजय - तन्द्री के द्वीप
अनुवाद व्यवहार (अंग्रेजी से हिंदी में अनुवाद)

अंकविभाजन : पूर्णक 100

| व्याख्याएँ (काव्य सुप्रमा) | 6 में से 3 | 3 x 10 = 30 अंक |
| आलोचनात्मक प्रश्न (काव्य सुप्रमा) | 4 में से 2 | 2 x 15 = 30 अंक |
| लघुतरी प्रश्न (काव्य सुप्रमा) | 8 में से 5 | 5 x 4 = 20 अंक |
| अनुवाद (अंग्रेजी से हिंदी) | 2 में से 1 | 1 x 20 = 20 अंक |

अध्ययन के लिए सहायक पुस्तकें

- प्राचीन हिंदी काव्य, डॉ. ओमप्रकाश, राधाकृष्ण प्रकाशन, दिल्ली
- हिंदी के प्रतिनिधि कवि, डॉ. द्वारिका प्रसाद महेन्द्र, विनोद पुस्तक मन्दिर, आगरा
- आधुनिक हिंदी कविता की प्रवृत्तियाँ, डॉ. नामदेव सिंह, लोकभारती प्रकाशन, इलाहाबाद
- अनुवाद : सिद्धान्त और प्रयोग, जी. गोपीनाथ, लोकभारती प्रकाशन, इलाहाबाद
- अनुवाद कला : सिद्धान्त और प्रयोग, डॉ. कैलाशचन्द्र भाटिया, तत्कालिन प्रकाशन, नई दिल्ली
PART II

ENGLISH
PONDICHERRY UNIVERSITY
Part II - ENGLISH (for 4 Semesters),

LANGUAGE COURSE FOR B.Sc.B.Ed.& B.A.B.Ed.

SEMESTER-I

English-1


UNIT-1 POETRY
UNIT-2 PROSE
UNIT-3 GRAMMAR (units from the text)
UNIT-4 VOCABULARY (from the text)
UNIT-5 WRITTEN COMMUNICATION (units from the text)

SEMESTER-II


UNIT-1 PROSE
UNIT-2 SHORT STORIES
UNIT-3 GRAMMAR (units from the text)
UNIT-4 VOCABULARY (units from the text)
UNIT-5 WRITTEN COMMUNICATION (units from the text)

SEMESTER-III


UNIT-1 PROSE
UNIT-2 POETRY
UNIT-3 DRAMA
UNIT-4 GRAMMAR & VOCABULARY (Chapters 23-32, on Sentence Structure from Contemporary English Grammar; Structure and composition by David Green, Trinity publication, 2015)
UNIT-5 WRITTEN COMMUNICATION
   (i) Letter writing [formal and informal]
   (ii) Resume writing

SEMESTER-IV


UNIT-1 PROSE
UNIT-2 POETRY
UNIT-3 DRAMA
UNIT-4 GRAMMAR & VOCABULARY (Chapters 33-36, on verb patterns and structures from Contemporary English Grammar; Structure and composition by David Green, Trinity publication, 2015)
UNIT-5 WRITTEN COMMUNICATION
   (i) Note Making
   (ii) Essay writing
B.Sc., B.Ed.,

PART III
SPECIALIZATION OF THE SUBJECTS
(MAIN)

MATHEMATICS
PHYSICS
CHEMISTRY
BOTANY
ZOOLOGY
COMPUTER SCIENCE
PART III

MATHEMATICS
# B.Sc., B.Ed. LIBERAL OPTIONS
## PART III: B.Sc.B.Ed.
### Branch: MATHEMATICS

<table>
<thead>
<tr>
<th>SEM</th>
<th>No.</th>
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*note: Stream for Supportive Papers should be chosen in the first semester, same stream should be chosen in the successive semesters

Stream A: Science related papers (Physics I, II and Chemistry I, II) or
Stream B: Computer related papers
# B.SC., B.ED. MATHEMATICS

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<td>Gregory's series- Summation of series.</td>
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### Prescribed Text (specify sections clearly)


### Recommended books


### e-Learning Source

- [http://ndl.iitkgp.ac.in](http://ndl.iitkgp.ac.in)
- [http://ocw.mit.edu](http://ocw.mit.edu)
- [http://mathforum.org](http://mathforum.org)
### CORE 2: DIFFERENTIAL CALCULUS

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<th>( n^{\text{th}} ) derivative – Standard results – Trigonometrical transformation – Formation of equations involving derivatives – Leibnitz formula.</th>
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<td>Total differential coefficients – Euler’s theorem - Partial derivatives of a function of two functions - Equations of tangent and normal - Taylor expansions of single and double variables.</td>
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<td>UNIT IV</td>
<td>Angle between the radius vector and tangent – Angle between the intersection of two curves – Polar sub tangent and sub normal.</td>
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<tr>
<td>UNIT V</td>
<td>Circle, radius and centre of curvature – Cartesian formula for radius of curvature – envelope.</td>
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**Prescribed Text (specify sections clearly)**


- Unit 1 : Chapter 3
- Unit 2: Chapter 8
- Unit 3 : Chapter 8, 9
- Unit 4 : Chapter 9
- Unit 5 : Chapter 10 (Section 1)

**Reference books**


**e-Learning Source**

- [http://ndl.iitkgp.ac.in](http://ndl.iitkgp.ac.in)
- [http://ocw.mit.edu](http://ocw.mit.edu)
- [http://mathforum.org](http://mathforum.org)
# CORE 3: ANALYTICAL GEOMETRY 3D

## UNIT I
Angle between 2 lines-projections-direction cosines-relation between the direction cosines of a straight line-the projection of the line joining \( P(x_1,y_1,z_1) \) and \( Q(x_2,y_2,z_2) \) on any line with d.c.'s \( l,m,n \)-direction cosines of any line joining 2 points-angle between the lines whose direction cosines are \( (l_1,m_1,n_1) \) and \( (l_2,m_2,n_2) \).

## UNIT II
General equation, angle between two planes, length of perpendicular from a given point to a plane, equations of the plane bisecting the angle between two planes.

## UNIT III
Symmetrical form, line through two points, reduction of unsymmetrical form to the symmetrical form - condition for a line to lie on a plane - plane through a line - condition for the two lines to be coplanar (Cartesian form) - equation of the plane containing two lines - To find the shortest distance between two skew lines - equation of the shortest Distance in Cartesian.

## UNIT IV
Equation of a sphere with given centre and radius - general equation of a sphere - diameter form - and circular section.

## UNIT V
Equation of a Cone with its vertex at the origin - equation of a quadratic cone with given vertex and given guiding curve - necessary condition for general equation of second degree to represent a cone - circular cone - equation of circular cone with given vertex - axis and semi vertical angle.

### Prescribed Text (specify sections clearly)

### Reference books

### e-Learning Source
- [http://ndl.iitkgp.ac.in](http://ndl.iitkgp.ac.in)
- [http://ocw.mit.edu](http://ocw.mit.edu)
- [http://mathforum.org](http://mathforum.org)
SEMESTER I

CORE 4: (SUPPORTIVE 1) PHYSICS I

UNIT-I: Moment of inertia – radius of gyration - parallel and perpendicular axis theorem, calculation of moment of inertia of (a) ring (b) disc (c) hollow and solid spheres. Angular momentum, torque and the relation between them. Simple harmonic motion, equation of SHM, composition of two SHM at right angles, Lissajous figures.

UNIT-II: Young’s modulus — bulk modulus — rigidity modulus and Poisson’s ratio — derivation of the expression for bending moment of a beam in terms of its curvature of neutral axis – determination of Young’s modulus of a rectangular bar — non – uniform bending — pin and microscope method-with theory (mathematical derivation) – expression for couple per unit twist-determination of rigidity modulus – torsion pendulum.


UNIT -IV: Newton’s law of cooling – determination of specific heat of liquid-Barton’s cooling correction in calorimetric experiments – specific heat capacity of gases – ratio of specific heat capacities


TEXTBOOKS:
1. Dr.Sabesan and others, A Textbook of Allied Physics Vol-Iand Vol-II
2. Ponnusamy and others, AncillaryPhysics.

REFERENCE BOOKS
PHYSICS I – PRACTICALS

Choose any 7 experiments from the list given below for each semester without overlap

LIST OF EXPERIMENTS:

1. Young’s modulus-Non-Uniform bending-Pin& Microscope
2. Rigidity modulus-Torsional oscillations without masses.
3. Comparison of coefficient of viscosity.
4. Surface tension of a liquid and interfacial surface tension by drop weight method.
5. Spectrometer –Refractive index of a liquid- Hollow prism.
7. Spectrometer -Grating-wavelength determination by minimum deviation method.
9. Thermal conductivity of a bad conductor - Lee’s disc method
11. Melde’s apparatus-Determination of frequency.
12. Meter Bridge - Temperature coefficient of the material of a coil of wire
13. Potentiometer – calibration of low range voltmeter (0 -1.5 V).
14. Potentiometer - calibration of ammeter (0-1.5 amps).
15. Figure of merit of a periodic moving coil galvanometer.
16. Field along the axis of the circular coil carrying current- Determination of B\text{H}.
17. Newton’s law of cooling and specific heat determination
18. Frequency measurement by forming Lissajous figures
20. Transistor characteristics-CE mode- only transfer characteristics.

TEXTBOOKS:
1. Ouseph and V.Srinivasan, Practical Physics- Part-I &II.

REFERENCE BOOKS
1. Mathchan Lazarus and others-Practical Physics.
CORE 4: (SUPPORTIVE 1) FUNDAMENTALS OF COMPUTER SCIENCE

UNIT I

UNIT II

UNIT III
Programming Languages; Machine Language, Assembly Language, High Level Language, Types of High-Level Language - Introduction to Software Development: Defining the Problem, Program Design, Coding, Testing, Documenting, and maintaining the program.

UNIT IV
Introduction to C- Character set, Tokens, Identifiers and keywords. Data type, Declarations, Expressions, statements and symbolic constants, Input-Output: getchar, putchar, scanf, printf, gets, puts, Pre-processor commands, #include, define, preparing and running a complete C program.

UNIT V
Operators and expressions: Arithmetic, Unary, Logical, bit-wise, assignments and conditional operator, comma operator , Library functions. Control statements: While, do, for statement, jump in loops, nested loops, if-else, switch, break, continue and goto statements.

TEXT BOOK
2. E. Balagurusamy , Programming In ANSI C , Tata McGraw Hill , 2004

REFERENCE
SEMESTER I

PRACTICAL - COMPUTER PRACTICE LAB

MS-WORD
1. Text Manipulations and Text Formatting
2. Usage of Bookmarks, Footnotes, Columns & Hyperlink
3. Usage of Header, Footer, Bulleting and Numbering & Borders and Shading
4. Usage of Tables - Sorting & Formatting
5. Usage of Spell Check, Find and replace
6. Picture insertion and alignment
7. Creation of documents using templates
8. Mail Merge, Envelopes and Labels

MS-EXCEL
9. Cell Editing and Formatting
10. Usage of Formulae and Built-in functions
11. Data Sorting, filter, form, subtotal, validation, Goal seek
12. Inserting Clip arts, objects, pictures and Data Filter, Validation, Subtotals
13. Usage of auditing, comments
14. Graph
15. Usage of Auto Formatting, Conditional Formatting & Style

MS - POWER POINT
16. Inserting New slides, text box, object, charts, tables, pictures, movies and sound
17. Slide layout, Colour Scheme, Background and Design template
18. Preparation of organizational charts
19. Preset and custom animation, action buttons and settings, Slide Transitions and animations, view show, slide sorter view
20. Presentation using Wizards
21. Usage of Design templates

Introduction to C- PROGRAMMING
22. Check for Biggest Number ,Prime Number, Armstrong number,
23. Fibonacci Series
24. Summation of the series: Sin (x) , Cos(x), Exp(x)
### CORE 5: INTEGRAL CALCULUS

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<th>Integration of rational algebraic functions – Integration of irrational algebraic functions - Properties of definite integrals</th>
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<td>UNIT II</td>
<td>Integration by parts – Bernoulli’s formula – Reduction formulae</td>
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<td>UNIT III</td>
<td>Evaluation of double integral – Changing of order of integration - Double integral in Polar co-ordinates – Triple integral</td>
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<tr>
<td>UNIT IV</td>
<td>Jacobian – Change of variables in the case of two variable and three variables – Transformation from Cartesian to polar co-ordinate - Transformation from Cartesian to spherical co-ordinates -</td>
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<tr>
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<td>Properties – relation between Beta and Gamma functions - Recurrence formula</td>
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**Prescribed Text (specify sections clearly)**

  - Unit I: Chapter 1 : 7.3, 7.4, 7.5, 8, 11
  - Unit II : Chapter 1: 12,13,
  - Unit III: Chapter 5 : 2.1, 2.2, 3.1, 4
  - Unit IV : Chapter 6: 1.1, 1.2, 2.1,2.2,2.3,2.4
  - Unit v : Chapter 7: 2.1, 2.2, 2.3, 3, 4, 5

**Reference books**


**e-Learning Source**

- [ndl.iitkgp.ac.in](http://ndl.iitkgp.ac.in)
- [ocw.mit.edu](http://ocw.mit.edu)
- [mathforum.org](http://mathforum.org)
### SEMESTER II

**CORE 6: ABSTRACT ALGEBRA**

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<th>UNIT I</th>
<th>Definition of Group - examples of groups - Some preliminary lemmas - Subgroups.</th>
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<tr>
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<td>A counting principle - Normal subgroups and Quotient Groups – Homomorphisms.</td>
</tr>
<tr>
<td>UNIT III</td>
<td>Automorphisms - Cayley's theorem - Permutation groups.</td>
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<tr>
<td>UNIT IV</td>
<td>Definition of Ring- examples of a rings - Some special classes of rings - Homomorphisms – Ideals and quotients rings.</td>
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<tr>
<td>UNIT V</td>
<td>More ideals and quotients rings - The field of quotients of an integral domain.</td>
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**Prescribed Text (specify sections clearly)**

  - Unit I: Sections 2.1 to 2.4
  - Unit II: Sections 2.5 to 2.7 (except applications 1 & 2 of 2.7)
  - Unit III: Sections 2.8 to 2.10
  - Unit IV: Sections 3.1 to 3.3
  - Unit V: Sections 3.4, 3.6

**Reference Books**

1. A First course in Algebra by J. B. Fraleigh, Addison Wesley.
2. Modern Algebra by M.L. Santiago, (TMG)

**e-Learning Source**

- [http://ndl.iitkgp.ac.in](http://ndl.iitkgp.ac.in)
- [http://ocw.mit.edu](http://ocw.mit.edu)
- [http://mathforum.org](http://mathforum.org)
## CORE 7: REAL ANALYSIS I

| UNIT I | Sets and elements — Operations on sets — Functions - Real valued functions - Equivalence — Countability — Real numbers — Least upper bound — Greatest lower bound. |
| UNIT II | Definition of sequence and subsequence — Limit of a sequence — Convergent sequence — Bounded sequence Monotone sequence - Operation on convergent sequence - Limit superior and limit inferior — Cauchy sequence |
| UNIT III | Convergence and divergence- Series with non-negative terms - Alternating series — Conditional convergence and absolute convergence - Tests for absolute convergence - Series whose terms form a non-increasing sequence — Summation by parts. |
| UNIT IV | Limit of a function on the real line - Metric spaces (Examples 4 and 5 under 4.2 c to be omitted) - Limits in metric spaces. |
| UNIT V | Functions continuous at a point on the real line Reformulation — Functions continuous on a metric space - Open sets and closed sets – Discontinuous functions on R |

**Prescribed Text (specify sections clearly)**

- *Methods of Real Analysis, Treatment as in Richard R. Goldberg (1970)*
  - Unit 1 : Chapter 1
  - Unit 2, 3: Chapter 2 and Chapter 3 (up to 3.8)
  - Unit 4 : Chapter 4
  - Unit 5 : Chapter 5

**Reference Books**

1. *A First Course in Mathematical Analysis- D somasundaram & B Choudhryi- Narosa Publishing house New Dehli*

**e-Learning Source**

- [http://ndl.iitkgp.ac.in](http://ndl.iitkgp.ac.in)
- [http://ocw.mit.edu](http://ocw.mit.edu)
- [http://mathforum.org](http://mathforum.org)
CORE 8: (SUPPORTIVE 2) PHYSICS II


UNIT -II: Gauss’s law with proof – Electric intensity and potential due to a uniformly charged hollow conductor at a point outside, on the surface and inside a spherical conductor — capacity of a parallel plate condenser with and without a dielectric slab - capacity of a spherical conductor - Biot & Savart’s law — field along the axis of a circular coil carrying current – force on current carrying conductor placed in a magnetic field – theory of moving coil galvanometer.


UNIT-V: Rectifiers & filters (qualitative ideas) – Transistor characteristics – transistor as a RC coupled amplifier – frequency response (without derivation) – band width – basic principles of an oscillator-Hartley oscillator – working (without derivation) – elementary ideas about modulation – elementary ideas about TV transmission and reception.

TEXTBOOKS:
1. Dr. Sabesan and others, A Textbook of Allied Physics-Vol-I and Vol-II.
2. Ponnusamy and others, Ancillary Physics.

REFERENCEBOOKS

PHYSICS II – PRACTICALS

Ref: Physics Practical I
SEMESTER II

CORE 8: (SUPPORTIVE 2) PRINCIPLES OF PROGRAMMING AND C

UNIT I

UNIT II
Arrays: Defining and processing. One dimensional arrays- Two dimensional arrays. Initializing One and Two dimensional arrays- Multi dimensional arrays. Character Arrays and Strings-Introduction. Declaring and initializing String variables Comparison of Two Strings String-handling functions, Table of Strings

UNIT III

UNIT IV
Structure: Defining and processing. Structure initialization Operations on individual members Arrays of structures Arrays within Structures, Structures and Functions- Passing to a function, Union.

UNIT V
Pointers: Declarations and initialization of pointer variables, Accessing pointer variables, Passing to a function. Operations on pointers, pointer and arrays. Array of pointers, Pointer to Functions. Data Files: Open, close, create, process unformatted data files.

TEXT BOOK

REFERENCE
PRACTICAL - PROGRAMMING IN C

1. Array Operations
2. String Manipulations
   a. Counting number of vowels, consonants, words, white spaces in a string
   b. Reversing a string and check for palindrome
   c. Finding the number of occurrences of a sub string in a given string
   d. Sub string replacing and removal
3. Using Functions
4. Recursion
   a. Factorial
   b. Reversing a string
   c. Fibonacci Sequence
5. Matrix Manipulations using functions and Case structure
   a. Addition & Subtraction
   b. Multiplication
   c. Transpose
   d. Check if the given matrix is a Magic square
6. Searching
7. Sorting
8. Structures
9. Pointers
10. File
# CORE 9: LINEAR ALGEBRA

<table>
<thead>
<tr>
<th>UNIT</th>
<th>Topics</th>
</tr>
</thead>
<tbody>
<tr>
<td>UNIT I</td>
<td>Vector spaces - Elementary Concepts - subspaces</td>
</tr>
<tr>
<td>UNIT II</td>
<td>Linear independence - Bases - Dual spaces</td>
</tr>
<tr>
<td>UNIT III</td>
<td>Inner product spaces</td>
</tr>
<tr>
<td>UNIT IV</td>
<td>Algebra of Linear transformations - Characteristic roots.</td>
</tr>
<tr>
<td>UNIT V</td>
<td>Matrices : Canonical forms - triangular forms</td>
</tr>
</tbody>
</table>

**Prescribed Text (specify sections clearly)**

- Topics in Algebra – I.N Herstein, Wiley Eastern Limited
  - Chapter -4: Sections 4.1 – 4.4
  - Chapter -5; Sections 6.1—6.4

**Reference Books**

1. First course in Algebra - John B. Fraleigh, Addison Wesley
2. University Algebra – N. S. Gopalakrishnan - Wiley Eastern Limited
4. S. Lipschutz – Linear Algebra, TMG Hill

**e-Learning Source**

- [http://ndl.iitkgp.ac.in](http://ndl.iitkgp.ac.in)
- [http://ocw.mit.edu](http://ocw.mit.edu)
- [http://mathforum.org](http://mathforum.org)
# CORE 10: ORDINARY DIFFERENTIAL EQUATIONS

<table>
<thead>
<tr>
<th>UNIT I</th>
<th>Exact differential equations – Equations of the First, but of higher degree – Equations solvable for $dy/dx$, solvable for $y$, solvable for $x$, Clairaut’s form</th>
</tr>
</thead>
<tbody>
<tr>
<td>UNIT II</td>
<td>Linear Differential equations with constant co-efficients - Linear differential equations with variable coefficients.</td>
</tr>
<tr>
<td>UNIT III</td>
<td>Method of Variation of parameters – Simultaneous Linear differential equations with constant coefficients</td>
</tr>
<tr>
<td>UNIT V</td>
<td>Inverse Laplace transforms – convolution theorem – initial and final value theorem – solution of linear ODE of second order with constant coefficients using Laplace transform.</td>
</tr>
</tbody>
</table>

### Prescribed Text (specify sections clearly)

1. *Calculus III* S.Narayanan and T.K. Manicavachagom Pillay, for Units I, II and III
2. *Engineering Mathematics - II* by Dr. M.B.K. Moorthy for Unit IV and Unit V

### Reference Books

1. *Introductory course in Differential equations*, D.A.Murray, Orient Longman (1967)

### e-Learning Source

- [http://ndl.iitkgp.ac.in](http://ndl.iitkgp.ac.in)
- [http://ocw.mit.edu](http://ocw.mit.edu)
- [http://mathforum.org](http://mathforum.org)
# CORE 11: OPERATIONS RESEARCH I

## UNIT I
Mathematical formulation of LPP – Graphical Solution of LPP – Definition of LPP – Canonical and Standard forms of LPP – Ordinary Simplex Method to solve LPP (Method and problems only) – Uses of Artificial variables Method (Big – M Method) - Two Phase Method

## UNIT II
Duality in LPP – Conversion of Primal to Dual – Duality and Simplex Method (Method and problems only) – Dual Simplex Method

## UNIT III

## UNIT IV
Mathematical formulation of Assignment Problems – Assignment Method – Travelling Salesman Problems

## UNIT V
Two person zero sum game – MAXIMIN – MINIMAX Principle – Saddle Point – Games without Saddle Point – Graphical solutions of 2 x n and m x 2 games – Dominance Property – General solution of m x n games by LPP

**Prescribed Text (specify sections clearly)**

  - Unit I: Chapter 2: Sections 2.1 – 2.3, Chapter 3: Sections 3.1 – 3.5
  - Chapter 4: Sections 4.1 – 4.4
  - Unit 2: Chapter 5: Sections 5.1 – 5.7, 5.9
  - Unit 3: Chapter 10: Sections 10.1 – 10.14
  - Unit 4: Chapter 11: Sections 11.1 – 11.6
  - Unit 5: Chapter 17: Sections 17.1 – 17.10

**Reference Books**


**e-Learning Source**

- [http://ndl.iitkgp.ac.in](http://ndl.iitkgp.ac.in)
- [http://ocw.mit.edu](http://ocw.mit.edu)
- [http://mathforum.org](http://mathforum.org)
CORE 12: (SUPPORTIVE 3) CHEMISTRY I

Unit 1
Intermolecular forces - Vanderwall and London forces. Liquid state theory and properties of liquids, liquid-crystal formation and applications. Solid state- forces in solids- covalent, ionic, metallic, and Vanderwall’s, Lattice energy.

Unit 2

Unit 3
Covalent bond- Orbital Overlap- hybridization, geometry of organic molecules- methane, ethylene, acetylene, benzene. Electron displacement effects, inductive, resonance, hyperconjugative and steric effects-their effect on properties of compounds. Stereoisomerism-Optical isomerism-optical activity, lactic acid, tartaric acid, racemization, resolution.

Unit 4:
Aromatic compounds-electrophilic substitution in benzene, mechanism of nitration, halogenation, Alkylation and Acylation. Preparation, properties and uses of Naphthalene, Furan, Thiophene, Pyrrole, Pyridine, Chloroform and Carbon Tetrachloride.

Unit 5:

Text books:

CHEMISTRY I PRACTICALS

1. Estimation of sodium hydroxide using sodium carbonate standard.
2. Estimation of hydrochloric acid using oxalic acid standard.
5. Estimation of oxalic acid using ferrous sulphate standard.
6. Preparation of the following inorganic compounds: ferrous ammonium sulphate, manganous sulphate, sodium thiosulphate.
CORE 12: (SUPPORTIVE 3) OBJECT ORIENTED PROGRAMMING

UNIT I
Introduction to Object Oriented Programming (OOP), C++ programming basic, Loops and decisions: Relational operators, loops, decision, logical operators, precedence.

UNIT II
Structures, enumerated data types. Function: simple functions, passing argument to functions, returning values from functions, reference arguments, overloaded functions, inline functions, variable and storage classes.

UNIT III
Objects and classes: Classes and Objects, Specifying the class, using the class, constructors, destructors, object as function arguments, returning object from function. Arrays: Arrays fundamentals, Array a Class member data, Array of objects, Strings. Operator overloading: unary operator, overloading binary operators, Data conversion.

UNIT IV
Inheritance: Derived Base class, derived class constructors, overloading member functions, class hierarchies, public and private inheritance, levels of inheritance multiple inheritance. Pointers: Address and pointers, pointers and arrays, pointers and functions, pointers and strings, Memory management, pointer to objects.

UNIT V
Virtual functions and other functions: Virtual functions, Friend functions, Static functions, this pointer. Files and Stream: String I/O, Object I/O with multiple objects, file pointer, disk I/O with member functions.

TEXT BOOK

REFERENCE
2. E. Balagurusamy, Object Oriented Programming with C++

OOPS LAB
1. Simple functions & Inline functions
2. Function overloading & Operator Overloading
3. Usage of classes and Objects
4. Constructors and Destructors
5. Inheritance & Multiple Inheritance
6. Pointers
7. Virtual Functions, Friend functions, this pointer and Static functions
8. Files
# SEMESTER IV

### Part III - B.Sc.B.Ed - Mathematics Syllabi

**Pondicherry University**

## CORE 13: REAL ANALYSIS II

<table>
<thead>
<tr>
<th>UNIT I</th>
<th>More about open sets - Connected sets. Bounded sets and totally bounded sets - Complete metric spaces.</th>
</tr>
</thead>
<tbody>
<tr>
<td>UNIT II</td>
<td>Compact metric spaces Continuous functions on compact metric Spaces - Continuity of the inverse function - Uniform continuity.</td>
</tr>
<tr>
<td>UNIT III</td>
<td>Sets of measure zero - Definition of the Riemann integral - Existence of the Riemann integral - Properties of the Riemann integral</td>
</tr>
<tr>
<td>UNIT IV</td>
<td>Derivatives - Rolle's theorem - The Law of the Mean - Fundamental theorem of Calculus - Improper integrals.</td>
</tr>
<tr>
<td>UNIT V</td>
<td>Hyperbolic function - The exponential function - The logarithmic function - Definition of $x^a$ - The trigonometric function - Taylor Theorem - L'Hopital's rule.</td>
</tr>
</tbody>
</table>

### Prescribed Text (specify sections clearly)

*Methods of Real Analysis, Treatment as in Richard R. Goldberg, (1970)*

- Unit 1: 6.1 to 6.4
- Unit 2: 6.5 to 6.8
- Unit 3: 7.1 to 7.4
- Unit 4: 7.5 to 7.10
- Unit 5: 8.1 to 8.7

### Reference Books

1. *First Course in Mathematical Analysis* by Dr. Somasundaram & B Choudhyri - Narosa Publishing house New Dehli
2. *Real Analysis* - by Shanti Narayan

### e-Learning Source

- [http://ndl.iitkgp.ac.in](http://ndl.iitkgp.ac.in)
- [http://ocw.mit.edu](http://ocw.mit.edu)
- [http://mathforum.org](http://mathforum.org)
### SEMESTER IV

**CORE 14: COMPLEX ANALYSIS I**

<table>
<thead>
<tr>
<th>UNIT I</th>
<th>Complex numbers - Definitions - Algebraic properties - Cartesian co-ordinates - Triangular inequality - Polar Form - Powers and roots - Region in the complex plane.</th>
</tr>
</thead>
<tbody>
<tr>
<td>UNIT II</td>
<td>Analytic functions - Functions of a complex variable - Mapping - Limit - Theorems on limits - Continuity - Derivatives - Differentiation formula - Cauchy Riemann equations - Sufficient conditions.</td>
</tr>
<tr>
<td>UNIT III</td>
<td>Cauchy Riemann equations in polar form - Analytic functions - Harmonic functions.</td>
</tr>
<tr>
<td>UNIT IV</td>
<td>Elementary functions - Exponential function - Trigonometric functions and their--properties - Hyperbolic functions - Logarithmic function – Branches - properties of logarithms - Complex exponents - Inverse trigonometric &amp; hyperbolic functions.</td>
</tr>
<tr>
<td>UNIT V</td>
<td>Mapping by elementary functions - The linear function 1/z - Linear fractional transformation - The function w = exp(z) , W = sin z, W = Cos z, z^{1/2} - Successive transformation W= z + 1/z.</td>
</tr>
</tbody>
</table>

**Prescribed Text (specify sections clearly)**


- UNIT I - chapter 1
- UNIT II - chapter 2
- UNIT III - chapter 2
- UNIT IV - chapter 3
- UNIT V - chapter 4

**Reference Books**

4. *V.Karunakaran, Complex Analysis, (2nd Edition), Narosa 2005*

**e-Learning Source**

- [http://ndl.iitkgp.ac.in](http://ndl.iitkgp.ac.in)
- [http://ocw.mit.edu](http://ocw.mit.edu)
- [http://mathforum.org](http://mathforum.org)
# CORE 15: MATHEMATICAL STATISTICS I

<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>UNIT V</td>
<td>Normal distribution – Properties of normal distribution – Mode, Median, MGF, Moments Points of inflexion, Median deviation about mean, Area property of Normal distribution – Problems using area Properties.</td>
</tr>
</tbody>
</table>

**Prescribed Text (specify sections clearly)**

Unit I : 5.1 to 5.4, 6.1 to 6.9  
Unit II : 6.10 to 6.13  
Unit III : 7.2  
Unit IV : 7.3  
Unit V : 8.2.1 to 8.2.11

**Reference Books**


**e-Learning Source**

- [http://ndl.iitkgp.ac.in](http://ndl.iitkgp.ac.in)  
- [http://ocw.mit.edu](http://ocw.mit.edu)  
- [http://mathforum.org](http://mathforum.org)
CORE 16: (SUPPORTIVE 4) CHEMISTRY II

Unit 1:
Co-ordination chemistry – definition of terms, classification of ligands, nomenclature. Chelation – examples, chelate effect explanation. Werner’s theory- conductivity and precipitation studies. Sedgwick’s theory- Effective atomic number concept. Pauling’s theory-postulates, applications to octahedral, square, planar and tetrahedral complexes.

Unit 2:

Unit 3:

Unit 4:

Unit 5:

Text books:
CHEMISTRY II PRACTICAL

1. Detection of elements – nitrogen, sulphur and halogens.
2. Preliminary test and detection of carbohydrate, urea, benzamide and aromatic amines.
4. Reaction of aldehyde (aromatic), ketone (aliphatic and aromatic), carbohydrate, carboxylic acid (mono-and dicarboxylic-), phenol, aromatic primary amine, amide and diamide.
5. Systematic analysis of organic compounds containing one functional group and characterization by confirmatory tests or derivatives.
SEMESTER IV

CORE 16: (SUPPORTIVE 4) VISUAL PROGRAMMING

VISUAL PROGRAMMING

UNIT I

UNIT II
Adding code and using events: Using literals data types - declaring and using variables using the operator subroutines and functions looping and decision control structures if then else structure select structure, for next, do.. loop and while.. wend.- Using intrinsic Visual basic Controls with methods and Properties: Label ,Text box, Command button, Frame, Checkbox, option button, List box, Combo box, Drive List box, directory List box and file list box Formatting controls control arrays, Tab order

UNIT III
Functions and Procedure - Passing arguments by value and reference Arrays, dynamic arrays User defined datatypes symbolic constants using Dialog boxes: Input box, Message box functions - String functions, date and Time function, numeric functions

UNIT IV
Menus: creating menus, adding code to menus, using MDI forms - MDI form basic building MDI form creating MDI Child Forms

UNIT V
Database object (DAO) and properties accessing Recordset objects Move first, MoveLast, MovePrevious and MoveNext methods Begin, Commit and Rollback transaction accessing Microsoft Access files. Active Data Objects (ADO) ADO and OLE DB and ADO Primer What are OLE DB and ADO? ADO object Model Converting DAO Code to Use ADO Connecting to the database Retrieving a recordset Creating a query dynamically Using a parameterized query using action queries - Adding records Editing records closing the database connection.

TEXT BOOKS
1. Gary Cornwell Visual basic 6, Tata McGraw Hill
2. Scott warner Teach yourself Visual basic 6, Tata McGraw-Hill
4. Eric A. Smith, Valar Whisler, and Hank Marquis Visual Basic programming

PRACTICAL - VISUAL PROGRAMMING LAB
1. Building simple applications
2. Working with intrinsic controls and ActiveX controls
3. Application with multiple forms
4. Application with dialogs
5. Application with Menus
6. Application using data controls
7. Application using Common Dialogs
8. Drag and Drop Events
9. Students mark sheet processing
# CORE 17: PARTIAL DIFFERENTIAL EQUATIONS

## UNIT I

## UNIT II
Standard types of first order equations – Standard 1,2,3,4 - Equations reducible to standard forms.

## UNIT III
Lagrange’s equations - Charpit’s Method.

## UNIT IV
Linear Partial Differential equation of Second and higher order with constant coefficients.

## UNIT V
One dimensional wave equations, heat equation, Laplace equation – Simple problems.

### Prescribed Text (specify sections clearly)
- S.Narayanan and T.K. ManicavachagomPillay, Calculus III
  - Unit 1, 2, 3 : Chapter 4
- Transforms and Partial differential equations by Dr. A. Singaravelu
  - Unit 4 : Chapter 3
  - Unit 5 : Chapter 4

### Reference Books
1. Introductory course in Differential equations , D.A.Murray, Orient Longman (1967)

### e-Learning Source
- [http://ndl.iitkgp.ac.in](http://ndl.iitkgp.ac.in)
- [http://ocw.mit.edu](http://ocw.mit.edu)
- [http://mathforum.org](http://mathforum.org)
## SEMESTER V

### Part III - B.Sc.B.Ed - Mathematics Syllabi

#### Pondicherry University

<table>
<thead>
<tr>
<th>UNIT I</th>
<th>Gradient of a scalar function – properties – directional derivatives – Divergence of a vector function – Curl of a vector function – related problems</th>
</tr>
</thead>
<tbody>
<tr>
<td>UNIT II</td>
<td>Vector identities – Line integrals – related problems</td>
</tr>
<tr>
<td>UNIT III</td>
<td>Surface integrals – Volume integrals</td>
</tr>
<tr>
<td>UNIT IV</td>
<td>Green’s theorem – Stokes’s theorem – Verification of theorems</td>
</tr>
<tr>
<td>UNIT V</td>
<td>Gauss divergence theorem – Verification of theorem</td>
</tr>
</tbody>
</table>

### Prescribed Text (specify sections clearly)


### Reference Books

1. Engineering Mathematics – II by Dr. M. B. K. Moorthy

### e-Learning Source

- [http://ndl.iitkgp.ac.in](http://ndl.iitkgp.ac.in)
- [http://ocw.mit.edu](http://ocw.mit.edu)
- [http://mathforum.org](http://mathforum.org)
## CORE 19: OPERATIONS RESEARCH II

<table>
<thead>
<tr>
<th>UNIT I</th>
<th>Network and Basic Components – Logical sequence – Rules for Network Construction – Critical Path Analysis – Probability Considerations in PERT – Difference between PERT and CPM</th>
</tr>
</thead>
</table>
| UNIT II| Deterministic inventory Models  
1. Uniform rate of demand infinite rate of production, no shortage  
2. Uniform rate of demand, Finite rate of replenishment, no shortages  
3. Uniform rate of demand, instantaneous Production with shortages  
4. Uniform rate of demand, instantaneous Production with shortages and fixed time |
| UNIT IV | Multi server queueing Model - Deriving Steady state Probabilities for M/M/c queueing system - System Measures – Deriving Steady state Probabilities for M/M/c queueing system with finite capacity - System Measures – Related Problems. |

**Prescribed Text (specify sections clearly)**


- **Unit 1:** Chapter 21: Sections 21.1 – 21.7
- **Unit 2:** Chapter 19: Sections 19.1 – 19.7
- **Unit 3:** Chapter 20: Sections 20.1 – 20.8
- **Unit 4:** Chapter 20: Sections 20.8
- **Unit 5:** Chapter 23: Sections 23.1 – 23.9

**Reference Books**


**e-Learning Source**

- [http://ndl.iitkgp.ac.in](http://ndl.iitkgp.ac.in)
- [http://ocw.mit.edu](http://ocw.mit.edu)
- [http://mathforum.org](http://mathforum.org)
## CORE 20: COMPLEX ANALYSIS II

<table>
<thead>
<tr>
<th>UNIT I</th>
<th>Contour integrals - Examples - The Cauchy Goursat's theorem - A preliminary lemma - Proof of Cauchy Goursat's theorem - Simply and multiple connected domains.</th>
</tr>
</thead>
<tbody>
<tr>
<td>UNIT II</td>
<td>The Cauchy integral formula - Derivatives of analytic functions - Morera's theorem - Maximum moduli of functions - Liouville’s theorem - The fundamental theorem of algebra.</td>
</tr>
<tr>
<td>UNIT III</td>
<td>Convergence of sequences and series - Taylor series - Observations and examples – Laurent Series (statement only).</td>
</tr>
<tr>
<td>UNIT IV</td>
<td>Singularities - Definitions and examples - Residues - The residue theorem - The principal part of a function - Residues and poles – zeros and poles of order m.</td>
</tr>
<tr>
<td>UNIT V</td>
<td></td>
</tr>
</tbody>
</table>

### Prescribed Text


Unit I: Chapter 4:Section 34-38

Unit II: Chapter 4 Section 39-43

Unit III: Chapter 5:Section 44-48

Unit IV: Chapter 6:Section 53-57

Unit V: Chapter 6:Section 58-60

### Reference Books

1. Functions of a Complex variable by B. S. Tyagi – KedarNath Ram NathPublishers (P) Ltd.
4. V. Karunakaran, Complex Analysis, (2nd Edition), Narosa 2005

### e-Learning Source

- [ndl.iitkgp.ac.in](http://ndl.iitkgp.ac.in)
- [http://ocw.mit.edu](http://ocw.mit.edu)
- [http://mathforum.org](http://mathforum.org)
# CORE 21: MATHEMATICAL STATISTICS II

<table>
<thead>
<tr>
<th>UNIT I</th>
<th>Correlation – Properties - Rank Correlation – Bivariate correlation</th>
</tr>
</thead>
<tbody>
<tr>
<td>UNIT II</td>
<td>Regression – Properties – Regression equations</td>
</tr>
<tr>
<td>UNIT III</td>
<td>Sampling – Types of sampling – Parameter and statistics – Test of significance – Null hypothesis – Alternate hypothesis – Procedures in testing of hypothesis – errors in sampling critical region – level of significance</td>
</tr>
<tr>
<td>UNIT IV</td>
<td>Test of significance of large sampling – Test of significance of single mean – Test of significance of difference between two means – test of significance of proportion – test of significance of difference between two proportions – test of significance of difference between two standard deviation</td>
</tr>
<tr>
<td>UNIT V</td>
<td>Chi square test (definition) – chi square test for test of goodness of fit – independence of attributes – student’s t – distribution (definition) – t-test for single mean – t-test for difference between two means – t-test for dependent sample – t-test for co-efficient of correlation</td>
</tr>
</tbody>
</table>

**Prescribed Text (specify sections clearly)**

- Unit I : 10.1 to 10.6
- Unit II : 10.7
- Unit III : 12.1 to 12.7
- Unit IV : 12.8 – 12.15
- Unit V : 13.1, 13.7, 14.1, 14.2

**Reference Books**

**E-Learning Source**
- [http://ndl.iitkgp.ac.in](http://ndl.iitkgp.ac.in)
- [http://ocw.mit.edu](http://ocw.mit.edu)
- [http://mathforum.org](http://mathforum.org)
### CORE 22: NUMERICAL METHODS

|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

**Prescribed Text (specify sections clearly)**
  - Unit 1: Chapter 3 and 4
  - Unit 2: Chapter 5
  - Unit 3: Chapter 6 and 9
  - Unit 4: Chapter 11 (Relevant portions)
  - Unit 5: Chapter11 (Relevant portions)

**Reference Books**
- Computer oriented Numerical Methods by V. Rajaram – PHI(P) Ltd.

**e-Learning Source**
- [http://ndl.iitkgp.ac.in](http://ndl.iitkgp.ac.in)
- [http://ocw.mit.edu](http://ocw.mit.edu)
- [http://mathforum.org](http://mathforum.org)
LIST OF PRACTICALS

1. Write a program to solve algebraic and transcendental equations by Bisection method
2. Write a program to solve algebraic equation and transcendental by Newton-Raphson method
3. Write a program to solve simultaneous linear algebraic equations by Gauss Jordan method
4. Write a program to find the inverse of a matrix of order n
5. Write a program to find the determinant of a matrix of order n
6. Write a program to solve simultaneous linear algebraic equations by Gauss Seidal
7. Write a program to evaluate definite integral by Trapezoidal rule
8. Write a program to evaluate definite integral by Simpson’s 1/3 rule
9. Write a program to solve first order ODE by Euler’s method
10. Write a program to solve the first order ODE by Runge Kutta method

Text Book:
Handmade Lab Manual for Programming Lab

E-Learning Source
http://ndl.iitkgp.ac.in
http://ocw.mit.edu
http://mathforum.org
PART III

PHYSICS
<table>
<thead>
<tr>
<th>SEM</th>
<th>No.</th>
<th>CODE</th>
<th>Sub</th>
<th>Name of the course</th>
<th>CCE</th>
<th>UE</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Core 1</td>
<td>Main 1</td>
<td>Mechanics of particles, rigid bodies and continuous media</td>
<td>30</td>
<td>70</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Core 2</td>
<td>Main 2</td>
<td>Kinetic Theory and Thermodynamics</td>
<td>30</td>
<td>70</td>
<td>100</td>
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<tr>
<td></td>
<td>Core 3</td>
<td>Main 3</td>
<td>Oscillations, waves and acoustics</td>
<td>30</td>
<td>70</td>
<td>100</td>
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<tr>
<td></td>
<td>Core 4 (Supportive 1)</td>
<td>Anci 1-1</td>
<td>Mathematics-I</td>
<td>30</td>
<td>70</td>
<td>100</td>
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</tr>
<tr>
<td>II</td>
<td>Core 5</td>
<td>Main 4</td>
<td>Optics</td>
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<td>70</td>
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</tr>
<tr>
<td></td>
<td>Core 6</td>
<td>Main 5</td>
<td>Electricity and Magnetism</td>
<td>30</td>
<td>70</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>Core 7</td>
<td>Main 6</td>
<td>Physics-Laboratory-I</td>
<td>50</td>
<td>50</td>
<td></td>
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<tr>
<td></td>
<td>Core 8 (Supportive 2)</td>
<td>Anci 1-2</td>
<td>Physics-Laboratory-II</td>
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<td>50</td>
<td></td>
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<td></td>
<td>Core 9</td>
<td>Main 7</td>
<td>Modern Physics and Relativity</td>
<td>30</td>
<td>70</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Core 10</td>
<td>Main 8</td>
<td>Solid State Physics</td>
<td>30</td>
<td>70</td>
<td>100</td>
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</tr>
<tr>
<td></td>
<td>Core 11</td>
<td>Main 9</td>
<td>Atomic and Molecular Spectroscopy</td>
<td>30</td>
<td>70</td>
<td>100</td>
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<tr>
<td></td>
<td>Core 12 (Supportive 3)</td>
<td>Anci 2-1</td>
<td>Chemistry-I</td>
<td>30</td>
<td>70</td>
<td>100</td>
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</tr>
<tr>
<td>IV</td>
<td>Core 13</td>
<td>Main 10</td>
<td>Electronics</td>
<td>30</td>
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</tr>
<tr>
<td></td>
<td>Core 14</td>
<td>Main 11</td>
<td>Numerical Methods and Computational Physics</td>
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CORE 1: MECHANICS OF PARTICLES, RIGID BODIES and CONTINUOUS MEDIA

Unit-I: Laws of Motion:

Unit-II: Gravitation:

Unit-III: Dynamics of Rigid Bodies:

UNIT-IV: ELASTICITY, VISCOSITY AND SURFACE TENSION:

Reference Books.

Text Books:
1. D.S. Mathur, Mechanics (S. Chand & Co.)
2. D.S. Mathur, Elements of Propeties of matter (S. Chand & Co.)
CORE 2: KINETIC THEORY AND THERMODYNAMICS

UNIT-I : Laws of Thermodynamics:


REFERENCE BOOKS:

TEXT BOOKS
1. Brijlal and Subramanian, Heat and thermodynamics, (S.Chand & Co)
CORE 3: OSCILLATIONS, WAVES AND ACOUSTICS

UNIT-I

Superposition of Two Harmonic oscillations: Two collinear harmonic oscillators, Linearity and Superposition Principle. (1) Oscillations having equal frequencies and (2) Oscillations having different frequencies (Beats), Two perpendicular harmonic oscillators, Graphical and Analytical Methods. Lissajous Figures with equal an unequal frequency and their uses.

UNIT – II


UNIT – III

Sound: Simple harmonic motion - forced vibrations and resonance - Fourier’s Theorem- Application to saw tooth wave and square wave - Wave intensity. Speed of longitudinal waves in a fluid - velocity of sound in air - dependence on pressure and temperature - normal mode vibrations of air columns.

UNIT-IV


Reference Books:
1. Vibrations and Waves, I.G. Main, (Cambridge University press)
4. Oscillations and waves, A P French, (MIT Introductory Physics Series)

Text Books:
1. Bajaj, Waves and Oscillations (Tata McGraw Hill)
2. D.P. Khandelwal, Oscillations and Waves (Himalaya Pub. House, Bombay)
UNIT-1 (ALGEBRA)
Matrices - Rank of a matrices - Consistency of a system of linear non-homogeneous equations (statement only) - Simple problems - Characteristic roots of a square matrix - Evaluation of Eigen values and Eigen vectors of a square matrix - Cayley Hamilton theorem (statement only) - Simple problems.

UNIT -2 (TRIGNOMETRY)
De Moivre's theorem - Expansions of Cos(nθ), Sin(nθ) and tan(nθ) - Powers of sines and cosines of θ in terms of functions of multiples of θ. Expansions of sin(θ), cos(θ) in a series of ascending powers of θ- Limits and approximations.

UNIT-3 (FUNCTIONS OF COMPLEX VARIABLE)
Analytic functions - Cauchy Riemann equations - derivation and simple problems - Harmonic functions

UNIT-4 (VECTOR CALCULUS)
Vector differentiations - Scalar point functions - Vector point functions - Derivatives of a Vector point functions, sum of two vector point functions, product of scalar and Vector point function, Vector product - The vector operator Del, Gradient, Divergence and Curl - Simple application problems involving Cartesians - Laplace Operator.

UNIT - 5 (POLAR CO-ORDINATES)
Angle between radius and vector and tangent - Angle of intersection of two curves - Pedal equations of a curve

Text books:
1. S. Narayanan and T.K. Manicavachagom pillai, Calculus, S. Viswanathan Publishers
4. P. DuraiPandian, Vector Calculus, 1984

Reference Books:
CORE 5: OPTICS

UNIT-I: Ray Optics:

UNIT-II: Reflection and refraction:

UNIT-III: Interference and diffraction:
Interference of light: The principle of superposition; two slit interference, coherence requirements for the sources, localized fringes in thin films, transition from fringes of equal thickness to those of equal inclination Michelson interferometer; its uses for determination of wavelength, wavelength difference and standardization of the meter. Intensity distribution in multiple beam interference; Fabry - Perot interferometer and concept of finesse.
Fraunhofer diffraction:
Diffraction at a single slit, a circular aperture and a circular disc. Resolution of images; Rayleigh criterion, resolving power of a telescope and a microscope -Outline of phase contrast microscope (no derivations).Diffraction grating: Diffraction at N parallel slits; plane diffraction grating, resolving power of gratings and prisms.

UNIT-IV: Polarization Optics:

REFERENCE BOOKS:
5. Introduction to Classical and Modern Optics, Jurger R. Meyer –Arednt, (Prentice Hall)

TEXT BOOKS:
2. Brijilal and Subramanian, Optics ((S.Chand & Co).
3. S.L. Kakani and H.C. Bhandrai, Optics (S.Chand & Co)
CORE 6: ELECTRICITY AND MAGNETISM

UNIT-I: Vector Analysis: Review of vector algebra (Scalar and Vector product), gradient, divergence, Curl and their significance, Vector Integration, Line, surface and volume integrals of Vector fields, Gauss-divergence theorem and Stoke's theorem of vectors (statement only).

UNIT-II: Electrostatics: Electrostatic Field, electric flux, Gauss's theorem of electrostatics. Applications of Gauss 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. Calculation of electric field from potential. Capacitance of an isolated spherical conductor. Parallel plate, spherical and cylindrical condenser. Energy per unit volume in electrostatic field. Dielectric medium, Polarisation, Displacement vector. Gauss's theorem in dielectrics. Parallel plate capacitor completely filled with dielectric.


REFERENCE BOOKS:

TEXT BOOKS:
1. K K Tewari, Electricity and Magnetism (S Chand and Co.)
2. Brijlal and Subramaniam, Electricity and Magnetism (S Chand and Co.)
3. S. Mahajan and A. A. Rangawala, Electricity and Magnetism, (Tata Me Graw - Hill)
4. Khare and Srivastava, Electricity and Magnetism, (Atmaram and sons, New Delhi.)
Choose any 8 experiments from the list given below

List of Experiments

1. Compound pendulum - determination of g, radius of gyration and moment of inertia
3. Surface tension of a liquid and interfacial surface tension (water & kerosene) - method of drops.
4. Rigidity modulus - torsional oscillations without masses.
5. Specific heat capacity of a liquid and emissivity of a surface - method of cooling.
7. Sonometer - determination of frequency and verification of laws of transverse vibrations.
8. Spectrometer- refractive index of a liquid - hollow prism.
9. P.O. box - resistivity and verification of laws of resistance.
10. Potentiometer - calibration of low range voltmeter (0 - 1.5 V).
11. Terminal velocity for bodies falling through a fluid
12. Jolly’s constant volume air thermometer - determination of melting point of wax
13. Computer simulation of motion of equation of motion for a system of particles
16. Computer simulation of motion of molecular rotations as rigid bodies

Text Books
1. Practical Physics C.C Ouseph, V.J.Rao and V.Vijayendran
2. Practical Physics M.N.Srinivasan, Sultan son Pub.
5. Verma, Ahluwalia, Sharma, Computational Physics, an Introduction (New Age Int. (P) Ltd.)

Reference Book
PHYSICS LABORATORY – II

Choose any 8 experiments from the list given below

1. Young's modulus - cantilever - pin & microscope.
2. Melde's apparatus - determination of frequency.
4. P.O. box - temperature coefficient of the material of a coil of wire.
5. Potentiometer - calibration of ammeter (0-1.5 amps).
6. Emf of thermocouple using digital thermometer
7. Study of characteristics of a thermistor
8. Stoke's method of viscosity determination
10. Kater's pendulum - determination of acceleration due to gravity at a place
11. Variation of period of oscillations of a spring (or rubber band) with mass and spring constant
12. Oscillations on a bifilar suspension
13. Y - Searle's method for determining Y, \( n \) and \( \eta \) of a material.
15. Computer simulation of analyzing a square wave-form for its harmonic components.
16. Computer simulation of Generation of phase space plots of simple harmonic oscillator

Text Books
1. Practical Physics C.C Ouseph, V.J.Rao and V.Vijayendran
2. Practical Physics M.N.Srinivasan, Sultan son Pubs
5. Verma, Ahluwalia, Sharma, Computational Physics, an Introduction (New Age Int. (P) Ltd.)

Reference Book
UNIT -1 (INTEGRAL CALCULUS)
Evaluation of $\int e^{ax} \cos(bx) \, dx$ and $\int e^{ax} \sin(bx) \, dx$, - Bernoulli’s formula for integration by parts – Definite integrals – reduction formulae – Related definite integrals – properties – reduction formula for $\int e^{ax} x^n \, dx$, $\int \sin^n x \, dx$ and $\int \cos^n x \, dx$ ($n$ is a positive integer) - Evaluation of $\int e^x x^n \, dx$, $\int \sin^n x \, dx$, $\int \cos^n x \, dx$. - Rule of writing down $\int \sin^n x \cos^n x \, dx$ and illustrations

UNIT -2 (VECTOR INTEGRATION)
Gauss Divergence theorem and Stokes’s theorem (Statement only) – Simple problems

UNIT-3 (FOURIER SERIES)
Definition – Finding Fourier co-efficient for a given period function with period $2\pi$ -
Odd and Even functions – Half range series

UNIT-4 (ORDINARY DIFFERENTIAL EQUATIONS)
Equations of the first order but not of the first degree – Equations solvable for $dy/dx$, -
equations solvable for $y$ - Equations Solvable for $x$ - Clairaut’s form (simple cases) – Linear
equations with constant coefficients – Evaluation of the particular integral of the equation –
e$^x$, sin(ax), Cos(ax), $x^k$, $e^{ax}$f(x)

UNIT – 5 (LAPLACE TRANSFORM)
Definitions – Condition for the existence of Laplace transform – Laplace transform of 1, $e^{at}$, $e^{-at}$, cos(at), sin(at), sinh(at), cosh(at) and $t^n$ - Simple problems – Laplace transform of the derivatives – Laplace transform of the integral – first shifting theorem – change of scale of
property – Laplace transform of function multiplied by $t$, divisible by $t$ – inverse Laplace
transform – solution of ordinary differential equations using Laplace transforms

Text books:
1. S. Narayanan and T.K. Manicavachagom pillai, Calculus, S. Viswanathan Publishers
2. P. DuraiPandian, Vector Calculus, 1984

Reference Books:
   Education, 2015
CORE 9: MODERN PHYSICS AND RELATIVITY

Unit I
Planck’s quantum, Planck’s constant and light as collection of photons; Photo – electric effect and Compton scattering. De Broglie wavelength and matter waves; Davission-Germer experiment Problems with Rutherford model – instability of atoms and observation of discrete atomic spectra; Bohr’s quantization rule and Atomic stability; calculation of energy levels for hydrogen atoms and their spectra.

Unit II
Position measurement – gamma ray microscope thought experiment; Wave – particle duality, Heisenberg uncertainty principle – impossibility of a particle following a trajectory; estimating minimum energy; Energy – time uncertainty principle. Two slit interference experiment with photons, atoms and particles; linear superposition principle as a consequence; matter waves and wave amplitude;

Unit III
Schrodinger equation for non–relativistic particles; momentum and energy operators; stationary states; physical interpretation of wave equation, probabilities and normalization; probability and probability current densities in one dimension, simple one dimensional problems.

Unit IV

Reference Books:

Text Books:
CORE 10: SOLID STATE PHYSICS

UNIT-I: Basics of Crystallography: Crystal geometry: Crystal lattice; crystal planes and Miller indices, unit cells. Typical crystal structures; coordination number, packing fraction. Symmetry elements; rotation, inversion and reflection, basics of point groups and crystal classes, space groups, reciprocal lattice Crystallography: Diffraction of X-rays by a crystal lattice. Laue's formulation of X-ray diffraction, Laue spots rotating crystal.


TEXTBOOKS
2.  S.O.Pillai, Solid State Physics (New Age International Ltd, New Delhi).
3.  J.P.Srivastava, Elements of Solid State Physics,2nd Ed.(PHI, 2007)

REFERENCEBOOKS
2.  W.A.Harrison, Electronic structure and the properties of solids(Freeman, 1980)
3.  JP. Mc Kelvey, Solid state and semiconductor physics(Krieger, 1982)
CORE 11: ATOMIC AND MOLECULAR SPECTROSCOPY

UNIT-I

**Atomic and X-ray Spectra:** Atomic spectra, Coupling schemes, L-S, J-J couplings, Spectral terms, s,p,d,f notation, selection rules. Spectra of mono-and di-valent atoms: Doublet fine structure of hydrogen lines; screening constants for mono valent atoms, series limits, doublet structure of alkali spectrum. X-ray spectra: The continuum X-ray spectrum; Duane and Hunt limit. Characteristic X-rays; Moseley's law, doublet fine structure, X-ray absorption spectra, absorption edges.

UNIT –II

**Effect of magnetic field on energy levels:** Angular momentum and magnetic moment of electron due to orbital motion Gyromagetic ratios for orbital and spin motions; Bohr magneton, vector model, Lande g factor, Normal and anomalous Zeeman effects with reference to sodium D-lines

Unit III

**Rotation and Vibration of Molecules:** Classification of molecules as various tops, Rotational energy levels of diatomic molecules (no derivation), inter nuclear distance. Pure rotation spectra; selection rules, isotope effects on rotational energies. Vibrational energy levels, force constants, anharmonicity, dissociation energy, Spectra of diatomic molecules: Vibration-rotation spectra; selection rules, P, Q and R branches.

**Electronic levels, Raman Effect:** Sharing of electrons; formation of molecular orbitals, molecular orbitals in H⁺ ion, MO theory of H₂ molecule, diatomic molecular orbitals, molecular orbital energy level diagram. Electronic band systems, sequences and progressions, Franck-Condon principle. Raman effect: Stokes and anti-Stokes lines, quantum theory of Raman effect, selection rules in Raman and IR spectra.

UNIT-IV

**Laser System, Types and Applications:** Origin of spectral width, Schalow-Townes limit (only statement), Purity of a spectral line; Coherence: spatial and temporal, Einstein's A and B coefficients; Conditions for laser action; existence of a metastable state, population inversion by pumping and cavity resonance condition. Ruby Laser, He-Ne Laser, Dye laser; Applications of lasers: Laser communication, Medical applications and Material processing. Elementary idea of second harmonic generation.

TEXT BOOKS

1. J. B. Rajam, Atomic Physics(S. Chand & Co)
4. Murugesan, Modern Physics, (S.Chand & Co.)
6. G.Aruuldhas, Molecular Structure & Spectroscopy,(Prentice-Hall of India)
7. M. N. Avadhanulu, An Introduction to Lasers (S.Chand and Co)
REFERENCE BOOKS
1. Walker and Straughn; Spectroscopy-Vol 1,11,III,(Wiely)
2. G Herzberg; Atomic spectra and atomic structure,(Courier Dover Publication)
3. R C Johnson, Introduction to Molecular spectra,(Methuen)
5. BB Laud; Lasers and Non-linear Optics, (Wiley Eastern, 1985)
6. G Herzberg; Molecular spectra and Molecular structure, (prentice Hall, New York)
7. R C Johnson; An Introduction to Molecular spectra (Methuen).
CORE 12: (SUPPORTIVE 3) CHEMISTRY I

Unit 1
Intermolecular forces - Vanderwall and London forces. Liquid state theory and properties of liquids, liquid-crystal formation and applications. Solid state- forces in solids- covalent, ionic, metallic, and Vanderwall’s, Lattice energy.

Unit 2

Unit 3
Covalent bond- Orbital Overlap- hybridization, geometry of organic molecules- methane, ethylene, acetylene, benzene. Electron displacement effects, inductive, resonance, hyperconjugative and steric effects-their effect on properties of compounds. Stereoisomerism-Optical isomerism-optical activity, lactic acid, tartaric acid, racemization, resolution.

Unit 4:
Aromatic compounds-electrophilic substitution in benzene, mechanism of nitration, halogenation, Alkylolation and Acylation. Preparation, properties and uses of Naphthalene, Furan, Thiophene, Pyrrole, Pyridine, Chloroform and Carbon Tetrachloride.

Unit 5:

Text books:
CHEMISTRY PRACTICALS I

1. Estimation of sodium hydroxide using sodium carbonate standard.
2. Estimation of hydrochloric acid using oxalic acid standard.
5. Estimation of oxalic acid using ferrous sulphate standard.
6. Preparation of the following inorganic compounds: ferrous ammonium sulphate, manganous sulphate, sodium thiosulphate.
CORE 13: ELECTRONICS


JFETS and MOSFETS: Construction of n-channel and p-channel JFETs-operation of n-channel JFET – Drain characteristics of n-channel JFET-Transfer characteristics – parameters of JFET-comparison between BJT and JFET. JFET biasing circuits. MOSFETS, characteristics and parameters.


TEXTBOOKS
1. R.S. Sedha, A textbook of applied electronics, 2005 (S. Chand & Co.,)
2. V.K.Metha, Principles of electronics, 2005 (S. Chand & Co.,)
4. M.K.Bagde, S.P. Singh, Element of Electronics(S.Chand & Co.)
5. D.Chathopadhyay & Rakshit, Electronic Fundamental and Applications (New Age International)
6. S. Salivahanan and N. Suresh Kumar, Electronic devices and electronic circuits, 2004 (TMH)
REFERENCE BOOKS

1. B.L. Theraja, Basic Electronics, 2005 (S. Chand & Co.,)
2. G. Nagarajan, Electronic devices, 2005 (Lakshmi Publications)
5. Horowitz and Hill, Art of Electronics (Cambridge University Press)
SEMESTER IV

CORE 14: NUMERICAL METHODS AND COMPUTATIONAL PHYSICS

Unit I

UNIT-II

UNIT-III

UNIT -IV
Programming: Algorithm – Flow Chart-Simple programs using FORTRAN: Area and volume of geometrical structures, sum of series, product of ‘n’ numbers, Straight line, ellipse, parabola and their slope.

TEXT BOOKS:
3. Rajaraman, Computer Programming in Fortran 90and 95, (Prentice Hall of India)

REFERENCE BOOKS:
CORE 15: PHYSICS LABORATORY

PHYSICS LABORATORY – III

Choose any 8 experiments from the list given below

LIST OF EXPERIMENTS.

1. Young’s modulus - Uniform bending - scale & telescope.
2. Rigidity modulus – Torsional pendulum with equal masses
3. Specific latent heat of fusion of ice.
5. Spectrometer - i-d curve.
7. Carry-Foster's bridge - Resistivity of the material of the coil of wire.
8. Potentiometer - Internal resistance of a cell.
9. B.G- Comparison of emf of two cells
10. Determining the focal length of high power microscope objective
11. Study of interference fringes bi-prism arrangements
12. Study of polarization of light by simple reflection
13. Study of the rise and decay of current in a RC circuit
14. Study of the impedance of an inductor at varying frequencies to measure R and L
16. Computer simulation of double slit interference

TEXTBOOKS

1. Practical Physics C.C Ouseph, V.J.Rao and V.Vijayendran
2. Practical Physics M.N.Srinivasan, Sultan son Pubs
3. D P Khandelwal, A Laboratory Manual in Physics for Undergraduate Students (Vani Publication, New Delhi)
6. Verma, Ahluwalia, Sharma, Computational Physics, an Introduction (New Age Int. (P) Ltd.)

REFERENCE BOOKS

1. Olon, Experiments in Modern Physics.
Choose any 8 experiments from the list given below LIST OF EXPERIMENTS.

1. Young’s modulus – Koenig’s method (Non uniform bending)
2. Rigidity Modulus – Statistic Torsion
3. Specific latent heat of fusion of ice
4. Spectrometer- determination of N - normal incidence method
5. Field along the axis of the circular coil carrying current and determination of $B$
6. Carry-Foster's bridge - Temperature co-efficient of the material of a wire.
7. Potentiometer -Calibration of high range voltmeter
8. Figure of merit of a periodic moving coil galvanometer.
9. B.G. - Comparison of capacities.
10. Melde's string-Specific gravity of a solid and liquid.
11. Study of optical rotation by solutions.
12. Study of the rise and decay of current in a RL circuits
13. Junction and Zenor diode characteristics
14. Study of Half and full wave rectifier
15. Computer simulation of effect of magnetic field on charged particles
16. Computer simulation of propagation of electromagnetic waves

TEXTBOOKS
1. Practical Physics C.C Ouseph, V.J.Rao and V.Vijayendran
2. Practical Physics M.N.Srinivasan, Sultan son Pubs
3. D P Khandelwal, A Laboratory Manual in Physics for Undergraduate Students (Vani Publication, New Delhi)
6. Verma, Ahluwalia, Sharma, Computational Physics, an Introduction (New Age Int. (P) Ltd.)

REFERENCE BOOKS
1. Olon, Experiments in Modern Physics.
CORE 16: (SUPPORTIVE 4) CHEMISTRY II

Unit 1:
Co-ordination chemistry – definition of terms, classification of ligands, nomenclature. Chelation – examples, chelate effect explanation. Werner’s theory- conductivity and precipitation studies. Sedgwick’s theory- Effective atomic number concept. Pauling’s theory- postulates, applications to octahedral, square, planar and tetrahedral complexes.

Unit 2:

Unit 3:

Unit 4:

Unit 5:

Text books:
SEMESTER IV

CHEMISTRY II PRACTICAL

1. Detection of elements – nitrogen, sulphur and halogens.
2. Preliminary test and detection of carbohydrate, urea, benzamide and aromatic amines.
4. Reaction of aldehyde (aromatic), ketone (aliphatic and aromatic), carbohydrate, carboxylic acid (mono-and dicarboxylic-), phenol, aromatic primary amine, amide and diamide.
5. Systematic analysis of organic compounds containing one functional group and characterization by confirmatory tests or derivatives.
CORE 17: NUCLEAR PHYSICS

Unit I
General Properties of Nuclei: Constituents of nucleus and their Intrinsic properties, quantitative facts about size, mass, charge density (matter energy), binding energy, average binding energy and its variation with mass number, main features of binding energy versus mass number curve, N/Z plot, angular momentum, parity, magnetic moment, electric moments, nuclear excites states.

Unit II
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 decay:(a) Alpha decay: basics of α-decay processes, theory of α-emission, Gamow factor, Geiger Nuttall law, α-decay spectroscopy. (b) β-decay: energy kinematics for β-decay, positron emission, electron capture, neutrino hypothesis. (c) Gamma decay: Gamma rays emission & kinematics, internal conversion. Nuclear Reactions: Types of Reactions, Conservation Laws, kinematics of reactions, Q-value, reaction rate, reaction cross section, Concept of compound and direct reaction, resonance reaction, Coulomb scattering (Rutherford scattering).

Unit IV
Particle physics: Particle interactions; basic features, types of particles and its families. Symmetries and Conservation Laws: energy and momentum, angular momentum, parity, baryon number, Lepton number, Isospin, Strangeness and charm, concept of quark model, color quantum number and gluons.

Reference Books:
1. Introduction to the physics of nuclei & particles, R.A. Dunlap. (Thomson Asia, 2004)
2. Quarks and Leptons, F. Halzen and A.D. Martin, Wiley India, New Delhi

Text Books
1. Introductory nuclear Physics by Kenneth S. Krane (Wiley India Pvt. Ltd., 2008).
3. Introduction to Elementary Particles, D. Griffith, John Wiley & Sons
CORE 18: QUANTUM MECHANICS


Unit II: Time independent Schrödinger equation: Hamiltonian, stationary states and energy eigenvalues; expansion of an arbitrary wave function as a linear combination of energy eigen functions; General solution of the time dependent Schrodinger equation in terms of linear combinations of stationary states; Application to the spread of Gaussian wave packet for a free particle in one dimension; wave packets, Fourier transforms and momentum space wave function; Position-momentum uncertainty principle.

Unit III: General discussion of bound states in an arbitrary potential: continuity of wave function, boundary condition and emergence of discrete energy levels; application to one-dimensional problem- square well potential; Quantum mechanics of simple harmonic oscillator-energy levels and energy eigen functions.

Unit IV: Quantum theory of hydrogen-like atoms: time independent Schrodinger equation in spherical polar coordinates; separation of variables for the second order partial differential equation; angular momentum operator and quantum numbers; Radial wavefunctions; Orbital angular momentum quantum numbers l and m; s, p, d,.. shells (idea only).

Reference Books:
2. Introduction to Quantum Mechanics, David J. Griffith, 2nd Ed. 2005, Pearson Education
4. Quantum Mechanics, Bruce Cameron Reed, 2008, Jones and Bartlett Learning.

Text Books
SEMESTER VI

CORE 19: DIGITAL ELECTRONICS

UNIT-I

Digital Principles: Number system, binary arithmetic, Basic gates and universal gate operations. Boolean algebraic theorems and properties-Karnaugh map: two and four variable map, POS and SOP simplification, NAND and NOR implementation, don't care condition, Logic families: characteristics and parameters. TTL gates, TTL open collector gates, CMOS gates, TTL-CMOS interface. Combinational logic design: parity checker, half and full adders, demultiplexer, multiplexer, decoders, encoders, PAL.

UNIT-II

Flip Flops and Counters: RS flip - flops, clocked RS flip - flop, edge-triggering. JK flip - flop, D-type flip-flop, JK master slave flip-flop design procedure; serial –in – serial out. Serial – in –parallel out shift registers asynchronous counters; decade counter (Mod10 counter); NE 555 timer as astable multivibrator.

UNIT-III


UNIT -IV


TEXT BOOKS

1. Malvino&Leach, Digital Principles and Applications (Tata McGraw Hill)
3. Morris Mano.M Digital logic and computer design, (Prentice Hall of India)
4. Ramesh S.Gaonkar, Microprocessor Architecture-Programming and Applications with the 8085 (Prentice Hall)

REFERENCE BOOKS

2. Floyd L. Thomas; Digital fundamentals (Universal Book stall.)
3. Jacob Millman, Microelectronics (McGraw Hill)
4. Badri Ram, Fundamentals of Microprocessors and microcomputers, (Dhanpat Rai Publication)
Choose any 8 experiments from the list given below LIST OF GENERAL PHYSICS EXPERIMENTS:

1. Newton’s Rings: determination of refractive index of the material of the lens.
2. Spectrometer: Hartmann’s Interpolation Formula - Determination of wavelength
3. Spectrometer: i - i’ curve and determination of refractive index.
4. Spectrometer: Grating – wavelength by normal incidence method
5. Young’s modulus: Elliptical fringes method.
6. Ultrasonic velocity and compressibility of the liquids - Interferometer method.
7. Field along the axis of a circular coil - Determination of moment of a magnet
8. Temperature co-efficient of a Thermistor
11. B.G Internal resistance of a cell
13. B.G: Quantity or charge sensitivity.
15. Diode laser: characteristic study
16. Simulation of 3-D models of a given kind of crystal and their study

TEXTBOOKS

1. Practical Physics C.C Ouseph, V.J.Rao and V.Vijayendran
2. Practical Physics M.N.Srinivasan, (Sultan son Pubs)
3. D P Khandelwal, A Laboratory Manual for Physics for Undergraduate Students (Vani Publications, New Delhi)
5. Verma, Ahluwalia & Sharma, “Computational Physics, an Introduction” (New Age Int.)

REFERENCE BOOKS

1. Olon, "Experiments in Modern Physics"
SEMESTER VI

PHYSICS LABORATORY – VI

Choose any 8 experiments from the list given below LIST OF ELECTRONICS EXPERIMENTS:

1. Study of CRO.
2. Transistor characteristics - common emitter.
3. Tuned collector oscillator - Frequency measurement by CRO and Frequency counter.
4. Tuned base oscillator - Frequency measurement by CRO and Frequency counter.
5. Astable multivibrator - Using 555 Timer - Frequency measurements
7. Phase shift oscillator - Frequency measurement by CRO and Frequency counter.
8. Basic Logic and Universal gates using diodes and transistors components.
9. NAND and NOR as universal gates using ICs
10. Transistor Amplitude modulator and measurement of percentage of modulation.
11. OP-AMP characteristics (741 IC) - parameter measurement
12. Implementation of logic expression and their simplification
13. Half-adder and full-adder
14. Parity generator / checker
15. Flip-flop circuits using gates
16. Asynchronous counters using ICs
17. Diode AM detection
18. Assembly language programming - microprocessor – addition.

TEXTBOOKS
1. Practical Physics C.C Ouseph, V.J.Rao and V.Vijayendran
2. Practical Physics M.N.Srinivasan, ( Sultan son Pubs)
5. Verma, Ahluwalia, Sharma, “Computational Physics, an Introduction” (New Age International)

REFERENCE BOOKS
CORE 21: RENEWABLE ENERGY AND ENERGY HARVESTING

**Unit I**

**Unit II**
Solar energy: Solar energy, its importance, storage of solar energy, solar pond, non convective solar pond, applications of solar pond and solar energy, solar water heater, flat plate collector, solar distillation, solar cooker, solar green houses, solar cell, absorption air conditioning. Need and characteristics of photovoltaic (PV) systems, PV models and equivalent circuits, and sun tracking systems.

**Unit III**

**Unit IV**
Electromagnetic Energy Harvesting: Linear generators, physics mathematical models, recent applications Carbon captured technologies, cell, batteries, power consumption, Environmental issues and Renewable sources of energy, sustainability.

**TEXT BOOKS:**
2. Solar energy - M P Agarwal - S Chand and Co. Ltd.

**REFERENCE BOOKS**
2. Oxford University Press, in association with The Open University.
Choose any 8 experiments from the list given below.

**LIST OF GENERAL PHYSICS EXPERIMENTS:**

1. Air wedge: Determination of the thickness and insulation of the wire.
2. Spectrometer: i - i' curve for given angle of deviation II method
3. Spectrometer small angle prism
4. Spectrometer: Determination of Cauchy ‘s constants
5. Spectrometer: Dispersive power of a grating
6. Filed along the axis of acicular coil – Determination of BH using Searl’s vibration magnetometer
7. Potentiometer: Resistance of potentiometer and measurement of emf of a thermocouple.
8. Potentiometer: Temperature coefficient of resistance of the material of a coil of wire.
10. B.G absolute capacity of a condenser
11. Study of divergence of a laser beam
12. Characteristics of a solar cell
14. Measurement of e by Milliken's method
15. Determination of Planck's constant
16. Hall probe in magnetic field measurement
17. Computer simulation of 1 -D and 2-D lattice vibrations

**TEXT BOOKS**

1. Practical Physics C.C Ouseph, V.J.Rao and V.Vijayendran
2. Practical Physics M.N.Srinivasan, ( Sultan son Pubs)
3. D P Khandelwal, A Laboratory Manual for Physics for Undergraduate Students (Vani Publications, New Delhi)
5. Verma, Ahluwalia & Sharma, “Computational Physics, an Introduction” (New Age Int.)

**REFERENCE BOOKS**

1. Olon, "Experiments in Modern Physics"
SEMESTER VIII

PHYSICS LABORATORY – VIII

Choose any 8 experiments from the list given below

LIST OF ELECTRONICS EXPERIMENTS:

1. Transistor characteristics - common base
2. Power pack - construction with Bridge rectifier and IC regulator.
3. Emitter follower
5. Hartley oscillator - Frequency measurement by CRO and Frequency counter.
6. Colpitt's oscillator- Frequency measurement by CRO and Frequency counter.
7. Clipping and Clamping circuits using diodes
8. Astable –multivibrator using transistor frequency measurement
9. Basic and Universal logic gates using ICs
10. JFET characteristics.
11. OP-AMP addition, subtraction, multiplication, Integration and differentiation.
12. Implementation of logic expression and the simplification
13. Arithmetic circuits using gates
14. Multiplexers, Demultiplexers
15. RS, D, JK and Master Slave
flip-flops 16 Shift Registers
17. Synchronous counters using ICs
18. Assembly language programming - microprocessor - subtraction

TEXTBOOKS

1. Practical Physics C.C Ouseph, V.J.Rao and V.Vijayendran
2. Practical Physics M.N.Srinivasan, ( Sultan son Pubs)
5. Verma, Ahluwalia, Sharma, “Computational Physics, an Introduction” (New Age International)

REFERENCE BOOKS

PART III

CHEMISTRY
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CORE 1: CHEMISTRY–I: ATOMIC STRUCTURE, BONDING, GENERAL ORGANIC CHEMISTRY

Unit-I Atomic Structure


Postulates of Quantum Mechanics-Time independent Schrodinger equation (derivation not required) and meaning of various terms in it. Significance of \( \psi \) and \( \psi^2 \), Schrödinger equation for hydrogen atom. Radial and angular parts of the hydrogenic wavefunctions (atomic orbitals) and their variations for \( 1s, 2s, 2p, 3s, 3p \) and \( 3d \) orbitals (Only graphical representation). Significance of quantum numbers, orbital angular momentum and quantum numbers \( m_l \) and \( m_s \). Shapes of \( s, p \) and \( d \) atomic orbitals, nodal planes. Spin quantum number \( (s) \) and magnetic spin quantum number \( (m_s) \). Rules for filling electrons in various orbitals, Electronic configurations of the atoms. Stability of half-filled and completely filled orbitals, Anomalous electronic configurations.

(14 Lectures)

Unit- II Chemical Bonding and Molecular Structure


Covalent Bonding:

VB Approach: Shapes of inorganic molecules and ions on the basis of VSEPR and hybridization with suitable examples of linear, trigonal planar, square planar, tetrahedral, trigonal bipyramidal and octahedral arrangements. Concept of resonance and resonating structures in various inorganic compounds.

MO Approach: Rules for the LCAO method, bonding and antibonding MOs. MO treatment of homonuclear and heteronuclear diatomic molecules viz., \( \text{H}_2, \text{O}_2, \text{N}_2, \text{CO}, \text{NO} \) and \( \text{NO}^+ \). Comparison of VB and MO approaches.

(16 Lectures)

Unit- III Fundamentals of Organic Chemistry


Strength of organic acids and bases: Comparative study with emphasis on factors affecting \( pK \) values. Aromaticity: Benzenoids and Hückel’s rule.

(8 Lectures)

Unit- IV Stereochemistry

Conformations: Ethane, butane and cyclohexane. Interconversion of Wedge Formula, Newmann, Sawhorse and Fischer representations. Concept of chirality (up to two carbon atoms).

Configuration: Geometrical and Optical isomerism; Enantiomerism, Diastereomerism and Meso compounds. Threo and erythro; D and L; \( \text{cis} - \text{trans} \) nomenclature; CIP Rules: R/ S (for upto 2 chiral carbon atoms) and E / Z Nomenclature (for up to two C=C systems).

(10 Lectures)
Unit V Aliphatic Hydrocarbons

Functional group approach for the following reactions (preparations and reactions) to be studied in context to their structure.

**Alkanes:** *Preparation:* Catalytic hydrogenation, Wurtz reaction, Kolbe’s synthesis and, from Grignard reagent. *Reactions:* Free radical Substitution: Halogenation.

**Alkenes:** *Preparation:* Elimination reactions: Dehydration of alcohols and dehydrohalogenation of alkyl halides (Saytzeff’s rule); *cis* alkenes (Partial catalytic hydrogenation) and *trans* alkenes (Birch reduction). *Reactions:* *cis*-addition (alk. KMnO₄) and *trans*-addition (bromine), Addition of HX (Markownikoff’s and anti-Markownikoff’s addition), Hydration, Ozonolysis, oxymercuration-demercuration, Hydroboration-oxidation.

**Alkynes:** *Preparation:* Acetylene from CaC₂ and conversion into higher alkynes; by dehalogenation of tetra halides and dehydrohalogenation of vicinal-dihalides. *Reactions:* Formation of metal acetylides, addition of bromine and alkaline KMnO₄, ozonolysis and oxidation with hot alk. KMnO₄.

(12 Lectures)

Reference Books:

CORE 2: BASIC ANALYTICAL CHEMISTRY

Unit I - Introduction: Introduction to Analytical Chemistry and its interdisciplinary nature. Concept of sampling. Importance of accuracy, precision and sources of error in analytical measurements. Presentation of experimental data and results, from the point of view of significant figures.

Analysis of soil: a. Composition of soil, Concept of pH and pH measurement, Complexometric titrations, Chelation, Chelating agents, use of indicators
   a. Determination of pH of soil samples.
   b. Estimation of Calcium and Magnesium ions as Calcium carbonate by complexometric titration.

Unit II - Analysis of water: Definition of pure water, sources responsible for contaminating water, water sampling methods, water purification methods.
   a. Determination of pH, acidity and alkalinity of a water sample.
   b. Determination of dissolved oxygen (DO) of a water sample.

Analysis of food products: Nutritional value of foods, idea about food processing and food preservations and adulteration.
   a. Identification of adulterants in some common food items like coffee powder, asafoetida, chilli powder, turmeric powder, coriander powder and pulses, etc.
   b. Analysis of preservatives and colouring matter.

Unit III - Chromatography:

Definition, general introduction on principles of chromatography, paper chromatography, TLC etc.
   a. Paper chromatographic separation of mixture of metal ion (Fe3+ and Al3+).
   b. To compare paint samples by TLC method.
   Ion-exchange: Column, ion-exchange chromatography etc.
   Determination of ion exchange capacity of anion / cation exchange resin (using batch procedure if use of column is not feasible).

Unit IV - Analysis of cosmetics:

Major and minor constituents and their function
   a. Analysis of deodorants and antiperspirants, Al, Zn, boric acid, chloride, sulphate.
   b. Determination of constituents of talcum powder: Magnesium oxide, Calcium oxide, Zinc oxide and Calcium carbonate by complexometric titration.

Suggested Applications (Any one):
   a. To study the use of phenolphthalein in traps cases.
   b. To analyze arson accelerants.
   c. To carry out analysis of gasoline.

Unit V - Suggested Instrumental demonstrations:
   a. Estimation of macro nutrients: Potassium, Calcium, Magnesium in soil samples by flame photometry.
   b. Spectrophotometric determination of Iron in Vitamin / Dietary Tablets.
   c. Spectrophotometric Identification and Determination of Caffeine and Benzoic Acid in Soft Drink.
Reference Books:

CORE 3: GREEN CHEMISTRY

Unit I

Introduction and Principles - Part A
What is Green Chemistry? Need for Green Chemistry. Goals of Green Chemistry. Limitations/ Obstacles in the pursuit of the goals of Green Chemistry

(4 Lectures)

Principles of Green Chemistry and Designing a Chemical synthesis
Twelve principles of Green Chemistry with their explanations and examples and special emphasis on the following:
Designing a Green Synthesis using these principles; Prevention of Waste/ byproducts; maximum incorporation of the materials used in the process into the final products, Atom Economy, calculation of atom economy of the rearrangement, addition, substitution and elimination reactions.

Unit II Principles - Part B
Prevention/ minimization of hazardous/ toxic products reducing toxicity. risk = (function) hazard × exposure; waste or pollution prevention hierarchy.
Green solvents— supercritical fluids, water as a solvent for organic reactions, ionic liquids, fluorous biphasic solvent, PEG, solventless processes, immobilized solvents and how to compare greenness of solvents.
Energy requirements for reactions – alternative sources of energy: use of microwaves and ultrasonic energy.
Selection of starting materials; avoidance of unnecessary derivatization – careful use of blocking/protecting groups.

Unit III Principles - Part C
Use of catalytic reagents (wherever possible) in preference to stoichiometric reagents; catalysis and green chemistry, comparison of heterogeneous and homogeneous catalysis, biocatalysis, asymmetric catalysis and photocatalysis.
Prevention of chemical accidents designing greener processes, inherent safer design, principle of ISD “What you don’t have cannot harm you”, greener alternative to Bhopal Gas Tragedy (safer route to carbaryl) and Flixborough accident (safer route to cyclohexanol) subdivision of ISD, minimization, simplification, substitution, moderation and limitation. Strengthening/ development of analytical techniques to prevent and minimize the generation of hazardous substances in chemical processes.

(30 Lectures)

Unit IV Examples of Green Synthesis/ Reactions and some real world cases
1. Green Synthesis of the following compounds: adipic acid, catechol, disodium iminodiacetate (alternative to Strecker synthesis)
2. Microwave assisted reactions in water: Hofmann Elimination, methyl benzoate to benzoic acid, oxidation of tolune and alcohols; microwave assisted reactions in organic solvents
3. Diels-Alder reaction and Decarboxylation reaction
4. Ultrasound assisted reactions: sonochemical Simmons-Smith Reaction (Ultrasonic alternative to Iodine)
5. Surfactants for carbon dioxide – replacing smog producing and ozone depleting solvents with CO2 for precision cleaning and dry cleaning of garments.
6. Designing of Environmentally safe marine antifoulant.
7. Rightfit pigment: synthetic azo pigments to replace toxic organic and inorganic pigments.
Part III - B.Sc.B.Ed - Chemistry Syllabi

8. An efficient, green synthesis of a compostable and widely applicable plastic (poly lactic acid) made from corn.
9. Healthier fats and oil by Green Chemistry: Enzymatic inter esterification for production of no Trans-Fats and Oils
10. Development of Fully Recyclable Carpet: Cradle to Cradle Carpeting

(16 Lectures)

Unit – V Future Trends in Green Chemistry
Oxidation reagents and catalysts; Biomimetic, multifunctional reagents; Combinatorial greenchemistry; Proliferation of solventless reactions; co crystal controlled solid state synthesis (C2S3); Green chemistry in sustainable development.

(10 Lectures)

Reference Books:

List of Experiments for Practical
1. Safer starting materials
   Preparation and characterization of nanoparticles of gold using tea leaves.
2. Using renewable resources
   Preparation of biodiesel from vegetable/ waste cooking oil.
3. Avoiding waste
   Principle of atom economy.
   Use of molecular model kit to stimulate the reaction to investigate how the atom economy can illustrate Green Chemistry.
   Preparation of propene by two methods can be studied
   (I) Triethylamine ion + OH- → propene + trimethylpropane + water
   (II) 1-propanol + H2SO4/Δ → propene + water
   Other types of reactions, like addition, elimination, substitution and rearrangement should also be studied for the calculation of atom economy.
4. Use of enzymes as catalysts
   Benzoin condensation using Thiamine Hydrochloride as a catalyst instead of cyanide.
5. Alternative Green solvents
   Extraction of D-limonene from orange peel using liquid CO2 prepared from dry ice.
   Mechanochemical solvent free synthesis of azomethines.
6. Alternative sources of energy
   1. Solvent free, microwave assisted one pot synthesis of phthalocyanine complex of copper (II).
   2. Photoreduction of benzophenone to benzopinacol in the presence of sunlight.
Reference Books:
CORE 4: (SUPPORTIVE 1)- MATHEMATICS-I

UNIT-1 (ALGEBRA)
Matrices - Rank of a matrices - Consistency of a system of linear non-homogeneous equations (statement only) - Simple problems - Characteristic roots of a square matrix - Evaluation of Eigen values and Eigen vectors of a square matrix - Cayley Hamilton theorem (Ostatement only) - Simple problems.

UNIT -2 (TRIGNOMETRY)
De Moivre's theorem - Expansions of Cos(nΘ), Sin(n0) and tan(nΘ) - Powers of sines and cosines of Θ in terms of functions of multiples of Θ. Expansions of sin(Θ), cos(Θ) in a series of ascending powers of0- Limits and approximations.

UNIT-3 (FUNCTIONS OF COMPLEX VARIABLE)
Analytic functions - Cauchy Riemann equations - derivation and simple problems - Harmonic functions

UNIT-4 (VECTOR CALCULUS)
Vector differentiations - Scalar point functions - Vector point functions - Derivatives of a Vector point functions, sum of two vector point functions, product of scalar and Vector point function, Vector product - The vector operator Del, Gradient, Divergence and Curl - Simple application problems involving Cartesians - Laplace Operator.

UNIT - 5 (POLAR CO-ORDINATES)
Angle between radius and vector and tangent - Angle of intersection of two curves - Pedal equations of a curve

Text books:
1. S. Narayanan and T.K. Manicavachagom pillai, Calculus, S. Viswanathan Publishers
4. P. DuraiPandian, Vector Calculus, 1984

Reference Books:
CORE 5: CHEMISTRY-II; CHEMICAL ENERGETICS, EQUILIBRIA & FUNCTIONAL ORGANIC CHEMISTRY-I

Unit I - Chemical Energetics and Chemical Equilibria


Unit II - Ionic Equilibria

Types of electrolytes, degree of ionization, factors affecting degree of ionization, ionization constant and ionic product of water. Ionization of weak acids and bases, pH scale, common ion effect. Salt hydrolysis-Buffer solutions. Solubility and solubility product of sparingly soluble salts – applications of solubility product principle. (12 Lectures)

Unit III – Aromatic Hydrocarbons

Functional group approach for the following reactions (preparations and reactions) to be studied in context to their structure. 

**Preparation** (Case benzene): from phenol, by decarboxylation, from acetylene, from benzene sulphonic acid. 

**Reactions**: (Case benzene): Electrophilic substitution: nitration, halogenation and sulfonation. Friedel-Craft’s reaction (alkylation and acylation). Side chain oxidation of alkyl benzenes. (8 Lectures)

Unit IV - Alkyl and Aryl Halides

**Alkyl Halides**: Types of Nucleophilic Substitution ($S_N1$, $S_N2$ and $S_Ni$) reactions. 

**Preparation**: from alkenes and alcohols. 

**Reactions**: hydrolysis, nitrite and nitro formation, nitrile and isonitrile formation. 

Williamson’s ether synthesis: Elimination versus substitution. 

**Aryl Halides** 

**Preparation**: (Chloro, bromo and iodo-benzene case): from phenol, Sandmeyer & Gattermann reactions. 

**Reactions (Chlorobenzene)**: Aromatic nucleophilic substitution (replacement by –OH group) and effect of nitro substituent. Benzyne Mechanism: $\text{KNH}_2/\text{NH}_3$ (or $\text{NaNH}_2/\text{NH}_3$). (8 Lectures)

Unit V - Aliphatic and Aromatic Carbonyl Compounds, Alcohols, Phenols and Ethers

**Aldehydes and ketones (aliphatic and aromatic)**: (Formaldehyde, acetaldehyde, acetone and benzaldehyde) 

**Preparation**: from acid chlorides and from nitriles. 

Alcohols, Phenols and Ethers (Up To 5 Carbons)

**Alcohols:** Preparation: Preparation of 1°, 2° and 3° alcohols: using Grignard reagent, Ester hydrolysis, Reduction of aldehydes, ketones, carboxylic acid and esters.

Reactions: With sodium, HX (Lucas test), esterification, oxidation (alk. KMnO₄, acidic dichromate, conc. HNO₃). Oppenauer oxidation

**Diols:** (Up To 6 Carbons) Oxidation of diols. Pinacol-Pinacolone rearrangement.

**Phenols:** (Phenol case) Preparation: Cumene hydroperoxide method, from diazonium salts.


**Ethers (aliphatic and aromatic):** Cleavage of ethers with HI.

(14 Lectures)

**Reference Books:**
CORE 6: ANALYTICAL CLINICAL BIOCHEMISTRY

Basic understanding of the structures, properties and functions of carbohydrates, lipids and proteins:

Unit I: Review of concepts studied in the core course:

Carbohydrates: Biological importance of carbohydrates, Metabolism, Cellular currency of energy (ATP), Glycolysis, Alcoholic and Lactic acid fermentations, Krebs cycle. Isolation and characterization of polysaccharides.

Unit II - Proteins:
Classification, biological importance; Primary and secondary and tertiary structures of proteins: α-helix and β-pleated sheets. Isolation, characterization, denaturation of proteins.

Enzymes: Nomenclature, Characteristics (mention of Ribozymes), Classification; Active site, Mechanism of enzyme action, Stereospecificity of enzymes, Coenzymes and cofactors, Enzyme inhibitors, Introduction to Biocatalysis: Importance in “Green Chemistry” and Chemical Industry.

Unit III - Lipids:
Classification. Biological importance of triglycerides and phosphoglycerides and cholesterol; Lipid membrane, Liposomes and their biological functions and underlying applications. Lipoproteins.


Unit IV – DNA & RNA

Structure of DNA (Watson-Crick model) and RNA, Genetic Code, Biological roles of DNA and RNA: Replication, Transcription and Translation, Introduction to Gene therapy. Enzymes: Nomenclature, classification, effect of pH, temperature on enzyme activity, enzyme inhibition.

Unit V - Biochemistry of disease: A diagnostic approach by blood/ urine analysis.


List of Experiments for Practical
Identification and estimation of the following:
1. Carbohydrates – qualitative and quantitative.
2. Lipids – qualitative.
3. Determination of the iodine number of oil.
4. Determination of the saponification number of oil.
5. Determination of cholesterol using Liebermann-Burchard reaction.
7. Isolation of protein.
8. Determination of protein by the Biuret reaction.

Reference Books:
1. T.G. Cooper: Tool of Biochemistry.
CORE 7: CHEMISTRY-LABORATORY

CHEMISTRY LABORATORY–I: ATOMIC STRUCTURE, BONDING, GENERAL ORGANIC CHEMISTRY

List of Experiments for Practical

Volumetric Analysis
1. Estimation of sodium carbonate and sodium hydrogen carbonate present in a mixture.
2. Estimation of oxalic acid by titrating it with KMnO₄.
3. Estimation of water of crystallization in Mohr’s salt by titrating with KMnO₄.
4. Estimation of Fe (II) ions by titrating it with K₂Cr₂O₇ using internal indicator.
5. Estimation of Cu (II) ions iodometrically using Na₂S₂O₃.

Organic Chemistry
1. Detection of extra elements (N, S, Cl, Br, I) in organic compounds (containing up to two extra elements).
2. Separation of organic compounds based on solubility.
3. Separation of mixtures by Chromatography: Measurement of the Rₖ value in each case (combination of two compounds to be given)
   a) Identification and separation of the components of a given mixture of 2 amino acids (glycine, aspartic acid, glutamic acid, tyrosine or any other amino acid) by paper chromatography.
   b) Identification and separation of the sugars present in the given mixture by paper chromatography.

Reference Books:
List of Experiments for Practical

Physical Chemistry

(Thermochemistry)
1. Determination of heat capacity of calorimeter for different volumes.
2. Determination of enthalpy of neutralization of hydrochloric acid with sodium hydroxide.
3. Determination of enthalpy of ionization of acetic acid.
4. Determination of integral enthalpy of solution of salts (KNO₃, NH₄Cl).
5. Determination of enthalpy of hydration of copper sulphate.
6. Study of the solubility of benzoic acid in water and determination of ΔH.

Ionic Equilibria (pH measurements)
1. Measurement of pH of different solutions like aerated drinks, fruit juices, shampoos and soaps (use dilute solutions of soaps and shampoos to prevent damage to the glass electrode) using pH-meter.
2. Preparation of buffer solutions:
   a. Sodium acetate-acetic acid
   b. Ammonium chloride-ammonium hydroxide
3. Measurement of the pH of buffer solutions and comparison of the values with theoretical values.

Organic Chemistry
1. Purification of organic compounds by crystallization (from water and alcohol) and distillation.
2. Criteria of Purity: Determination of melting and boiling points.
3. Preparations: Mechanism of various reactions involved to be discussed. Recrystallisation, determination of melting point and calculation of quantitative yield to be done.
   a) Bromination of Phenol/Aniline
   b) Benzoylation of amines/phenols
   c) Oxime and 2,4-dinitrophenylhydrazone of aldehyde/ketone
4. (a) Estimation of Aniline
   (b) Estimation of Phenol.

Reference Books
CORE 8: (SUPPORTIVE 2) MATHEMATICS-II

UNIT -1 (INTEGRAL CALCULUS)
Evaluation of \( \int e^{ax} \cos(bx) \, dx \) and \( \int e^{ax} \sin(bx) \, dx \), - Bernoulli's formula for integration by parts – Definite integrals – reduction formulae – Related definite integrals – properties – reduction formula for \( \int e^{ax} x^n \, dx \), \( \int \sin^n x \, dx \) and \( \int \cos^n x \, dx \) (n is a positive integer) - Evaluation of \( \int_0^{\pi/2} e^{x^2} \, dx \), \( \int_0^{\pi/2} \sin^n x \, dx \), \( \int_0^{\pi/2} \cos^n x \, dx \), - Rule of writing down \( \int_0^{\pi/2} \sin^n x \cos^n x \, dx \) and illustrations

UNIT -2 (VECTOR INTEGRATION)
Gauss Divergence theorem and Stokes’s theorem (Statement only) – Simple problems

UNIT-3 (FOURIER SERIES)
Definition – Finding Fourier co-efficient for a given period function with period 2\( \pi \)
Odd and Even functions – Half range series

UNIT-4 (ORDINAR DIFFERENTIAL EQUATIONS)
Equations of the first order but not of the first degree – Equations solvable for \( dy/dx \), - equations solvable for \( y \) - Equations Solvable for \( x \) - Clairaut’s form (simple cases) – Linear equations with constant coefficients – Evaluation of the particular integral of the equation – \( e^x \), \( \sin(ax) \), \( \cos(ax) \), \( x^k \), \( e^{\alpha x} f(x) \)

UNIT – 5 (LAPLACE TRANSFORM)
Definitions – Condition for the existence of Laplace transform – Laplace transform of 1, \( e^{at} \), \( e^{-at} \), \( \cos(at) \), \( \sin(at) \), \( \sinh(at) \), \( \cosh(at) \) and \( t^n \) - Simple problems – Laplace transform of the derivatives – Laplace transform of the integral – first shifting theorem – change of scale of property – Laplace transform of function multiplied by \( t \), divisible by \( t \) – inverse Laplace transform – solution of ordinary differential equations using Laplace transforms

Text books:
1. S. Narayanan and T.K. Manicavachagom pillai, Calculus, S. Viswanathan Publishers
2. P. DuraiPandian, Vector Calculus, 1984

Reference Books:
CORE 9: CHEMISTRY-III: SOLUTIONS, PHASE EQUILIBRIUM, ELECTROCHEMISTRY & FUNCTIONAL GROUP ORGANIC CHEMISTRY-II

Unit I Solutions and Phase Equilibria Solutions
(8 Lectures)

Phase Equilibrium
Phases, components and degrees of freedom of a system. Gibbs Phase Rule. Derivation of Clausius–Clapeyron equation and its importance in phase equilibria. Phase diagrams of one-component systems (water) and two component systems involving eutectics (lead-silver, metal-organic compound system).
(8 Lectures)

Unit II Electrochemistry Conductance
Conductivity, equivalent and molar conductivity and their variation with dilution for weak and strong electrolytes. Kohlrausch law of independent migration of ions. Transference number. Ionic mobility. Applications of conductance measurements: determination of degree of ionization of weak electrolyte, solubility and solubility products of sparingly soluble salts, ionic product of water, hydrolysis constant of a salt. Conductometric titrations (only acid-base).
(6 Lectures)

Electrochemistry
(8 Lectures)

Unit III Carboxylic acids, Amines and Diazonium Salts
Functional group approach for the following reactions (preparations & reactions) to be studied in context to their structure.
Carboxylic acids (aliphatic and aromatic): Preparation (Acidic and Alkaline hydrolysis of esters) and Reaction: (Hell – Volhard - Zelinsky Reaction).
Carboxylic acid derivatives (aliphatic): Preparation (Acid chlorides, Anhydrides, Esters and Amides from acids) and their interconversion.
Reactions: Reformatsky Reaction, Perkin condensation.
(6 Lectures)

Amines (Aliphatic and Aromatic):
Preparation: from alkyl halides, Gabriel’s Phthalimide synthesis, Hofmann Bromamide reaction.
(6 Lectures)
Diazonium salts: Preparation: from aromatic amines. 
Reactions: conversion to benzene, phenol, dyes. (6 Lectures)

Unit IV Amino Acids, Peptides and Proteins:
Preparation of Amino Acids: Strecker synthesis, using Gabriel’s phthalimide synthesis. 
Zwitterion, Isoelectric point and Electrophoresis. 
Reactions of Amino acids: esterification of –COOH group, acetylation of –NH₂ group, complexation with Cu²⁺ ions, ninhydrin test.
Overview of Primary, Secondary, Tertiary and Quaternary Structure of proteins. Determination of Primary structure of Peptides by degradation - Edman degradation (N-terminal) and C-terminal (thiohydantoin and with carboxypeptidase enzyme). Synthesis of simple peptides (upto dipeptides) by N-protection (t-butyloxycarbonyl and phthaloyl) & C-activating groups and Merrifield solid-phase synthesis. (10 Lectures)

Unit V Carbohydrates:
Carbohydrates: Classification, and General Properties, Glucose and Fructose (open chain and cyclic structure), Determination of configuration of monosaccharides, Mutarotation, ascending and descending in monosaccharides. Structure of disaccharides (sucrose, cellobiose, maltose, lactose) and polysaccharides (starch and cellulose) excluding their structure elucidation. (8 Lectures)

Reference Books:
CORE 10: FUEL CHEMISTRY

Unit I - Review of energy sources (renewable and nonrenewable).
Classification of fuels and their calorific value.

Unit II - Coal:
Uses of coal (fuel and nonfuel) 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.

Unit III - 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, biogas, fuels derived from biomass), fuel from waste, synthetic fuels (gaseous and liquids), clean fuels.

Unit IV - Petrochemicals:
Vinyl acetate, Propylene oxide, Isoprene, Butadiene, Toluene and its derivatives Xylene.

Unit V - Lubricants:
Classification of lubricants, lubricating oils (conducting and nonconducting) Solid and semisolid lubricants, synthetic lubricants. Properties of lubricants (viscosity index, cloud point, pour point) and their determination.

Reference Books:
CORE 11: MOLECULAR MODELLING & DRUG DESIGN

Unit I Introduction to Molecular Modeling

Unit II Force Fields

Unit III Energy Minimization and Computer Simulation

Unit IV Molecular Dynamics & Monte Carlo Simulation
Molecular Dynamics Simulation Methods. Molecular Dynamics using simple models. Molecular Dynamics with continuous potentials. Molecular Dynamics at constant temperature and pressure. Metropolis method. Monte Carlo simulation of molecules. Models used in Monte Carlo simulations of polymers. (12 Lectures)

Unit V Structure Prediction and Drug Design

Reference Books:
CORE 12: (SUPPORTIVE 3) PHYSICS-I

UNIT-I: Moment of inertia – radius of gyration - parallel and perpendicular axis theorem, calculation of moment of inertia of (a) ring (b) disc (c) hollow and solid spheres. Angular momentum, torque and the relation between them. Simple harmonic motion, equation of SHM, composition of two SHM at right angles, Lissajous figures.

UNIT-II: Young’s modulus — bulk modulus — rigidity modulus and Poisson’s ratio — derivation of the expression for bending moment of a beam in terms of it curvature of neutral axis – determination of Young’s modulus of a rectangular bar — non – uniform bending — pin and microscope method - with theory (mathematical derivation) – expression for couple per unit twist-determination of rigidity modulus – torsion pendulum.


TEXTBOOKS:
1. Dr.Sabesan and others,ATextbook of Allied Physics Vol-Iand Vol-II
2. Ponnusamy and others, AncillaryPhysics.

REFERENCE BOOKS
PHYSICS I – PRACTICALS

Choose any 7 experiments from the list given below for each semester without overlap

LIST OF EXPERIMENTS:

1. Young’s modulus-Non-Uniform bending-Pin& Microscope
2. Rigidity modulus-Torsional oscillations without masses.
3. Comparison of coefficient of viscosity.
4. Surface tension of a liquid and interfacial surface tension by drop weight method.
5. Spectrometer –Refractive index of a liquid- Hollow prism.
7. Spectrometer -Grating-wavelength determination by minimum deviation method.
9. Thermal conductivity of a bad conductor - Lee’s disc method
11. Melde’s apparatus-Determination of frequency.
12. Meter Bridge - Temperature coefficient of the material of a coil of wire
13. Potentiometer – calibration of low range voltmeter (0 -1.5 V).
14. Potentiometer - calibration of ammeter (0-1.5 amps).
15. Figure of merit of a periodic moving coil galvanometer.
16. Field along the axis of the circular coil carrying current- Determination of BH.
17. Newton’s law of cooling and specific heat determination
18. Frequency measurement by forming Lissajous figures
20. Transistor characteristics-CE mode- only transfer characteristics.

TEXTBOOKS:

1. Ouseph and V.Srinivasan, Practical Physics- Part-I &II.

REFERENCE BOOKS

1. Mathchan Lazarus and others-Practical Physics
CORE 13: CHEMISTRY-IV: COORDINATION CHEMISTRY, STATES OF MATTER & CHEMICAL KINETICS

Unit-I Transition Elements (3d series)
General group trends with special reference to electronic configuration, variable valency, colour, magnetic and catalytic properties, ability to form complexes and stability of various oxidation states (Latimer diagrams) for Mn, and Cr.
Lanthanoids and actinoids: Electronic configuration, oxidation states, colour, magnetic properties, lanthanide contraction and its consequences, separation of lanthanides (ion exchange method only).
(12 Lectures)

Unit-II Coordination Chemistry
IUPAC system of nomenclature. Valence Bond Theory (VBT): Inner and outer orbital complexes of Cr, Fe, Co, Ni and Cu (coordination numbers 4 and 6). Structural and stereoisomerism in complexes with coordination numbers 4 and 6. Drawbacks of VBT.
(8 Lectures) Crystal Field Theory: Crystal field effect, octahedral symmetry. Crystal field stabilization energy (CFSE), Crystal field effects for weak and strong fields. Tetrahedral symmetry. Factors affecting the magnitude of D. Spectrochemical series. Comparison of CFSE for Oh and Td complexes, Tetragonal distortion of octahedral geometry. Jahn-Teller distortion.
(10 Lectures)

Unit-III Kinetic Theory of Gases
Postulates of Kinetic Theory of Gases and derivation of the kinetic gas equation. Deviation of real gases from ideal behaviour, compressibility factor, causes of deviation. vander Waals equation of state for real gases. Boyle temperature (derivation not required). Critical phenomena, critical constants and their calculation from van der Waals equation. Maxwell Boltzmann distribution laws of molecular velocities and molecular energies (graphic representation – derivation not required) and their importance.
Temperature dependence of these distributions. Most probable, average and root mean square velocities (no derivation). Collision cross section, collision number, collision frequency, collision diameter and mean free path of molecules. Viscosity of gases and effect of temperature and pressure on coefficient of viscosity (qualitative treatment only).
(8 Lectures)

Unit IV – Condensed States of Matter Liquids
Viscosity of a liquid and determination of coefficient of viscosity using Ostwald viscometer. Effect of temperature on coefficient of viscosity of a liquid (qualitative treatment only).
(6 Lectures)

Solids
(8 Lectures)

Unit-V Chemical Kinetics
for determination of order of a reaction. Concept of activation energy and its calculation from Arrhenius equation.

Theories of Reaction Rates: Collision theory and Activated Complex theory of bimolecular reactions.

(8 Lectures)

**Reference Books:**

CORE 14: NANO CHEMISTRY

Unit-I: Basics of Nanochemistry
Basics of nanomaterials: Properties of nanomaterials, quantum confinement effect, surface to volume ratio, surface properties of nanoparticles. Classification of the nano materials – zero dimensional, one dimensional, two dimensional and three dimensional nanostructures.

Unit-II: Properties of Nanomaterials
Mechanical, optical, electronic, magnetic, thermal and chemical properties of nanomaterials. Size dependent properties-size dependent absorption spectra

Unit-III: Synthetic Techniques
Chemical methods: sol-gel synthesis, solvothermal synthesis, thermolysis route. Physical methods: Pulsed laser deposition- Magnetron sputtering

Unit-IV: Applications of Nanomaterials
Catalysis on nanoparticles, semiconductors, sensors, and electronic devices, photochemistry and nanophotonics, applications of CNTs, nanomaterials in biology and medicine.

Unit-V: Characterization Techniques
X-ray diffraction- Electron microscopes – scanning electron microscopes (SEM) – transmission electron microscopes (TEM) – scanning probe microscopy – atomic force microscopy (AFM) – scanning tunneling electron microscope (STEM) – basic principles only.

Reference Books:

List of Experiments for Practical
1. Chemical synthesis of Ag nanoparticles; UV-Visible absorption of the colloidal sol; Mie formalism; Estimation of size by curve fitting
2. Chemical synthesis of CdS nanoparticles; Optical absorption spectra; Band gap estimation from the band edge
3. Synthesis of ZnS nanoparticles by chemical route and determination of band structure through UV-Vis spectroscopy.
4. Aqueous to organic phase transfer of Ag and CdS nanoparticles; Confirmation by UV- Visible absorption.
CORE 15: CHEMISTRY LABORATORY

CHEMISTRY LABORATORY III: SOLUTIONS, PHASE EQUILIBRIUM, ELECTROCHEMISTRY & FUNCTIONAL GROUP ORGANIC CHEMISTRY-II

List of Experiments for
Practical Physical Chemistry

Distribution
Study of the equilibrium of one of the following reactions by the distribution method:

\[ \text{I}_2(\text{aq}) + I^- (\text{aq}) \rightarrow \text{I}_3^- (\text{aq}) \]
\[ \text{Cu}^{2+}(\text{aq}) + x\text{NH}_2(\text{aq}) \rightarrow [\text{Cu}(\text{NH}_3)_x]^2+ \]

Phase Equilibria
a) Construction of the phase diagram of a binary system (simple eutectic) using cooling curves.
b) Determination of the critical solution temperature and composition of the phenol-water system and study of the effect of impurities on it.
c) Study of the variation of mutual solubility temperature with concentration for the phenol-water system and determination of the critical solubility temperature.

Conductance
I. Determination of cell constant
II. Determination of equivalent conductance, degree of dissociation and dissociation constant of a weak acid.
III. Performing the following conductometric titrations:
   i. Strong acid vs. strong base
   ii. Weak acid vs. strong base

Potentiometry
Performing the following potentiometric titrations:
   i. Strong acid vs. strong base
   ii. Weak acid vs. strong base
   iii. Potassium dichromate vs. Mohr's salt

Organic Chemistry
I. Systematic Qualitative Organic Analysis of Organic Compounds possessing monofunctional groups (-COOH, phenolic, aldehydic, ketonic, amide, nitro, amines) and preparation of one derivative.

II. 1. Separation of amino acids by paper chromatography.
    2. Determination of the concentration of glycine solution by formylation method.
    3. Titration curve of glycine.
    4. Action of salivary amylase on starch
    5. Effect of temperature on the action of salivary amylase on starch.
    6. Differentiation between a reducing and a nonreducing sugar.

Reference Books:
CHEMISTRY LABORATORY IV: COORDINATION CHEMISTRY, STATES OF MATTER & CHEMICAL KINETICS

List of Experiments for Practical

Inorganic Chemistry

Semi-micro qualitative analysis using H₂S of mixtures - not more than four ionic species (two cations and two anions and excluding insoluble salts) out of the following:
Cations: NH₄⁺, Pb²⁺, Cu²⁺, Cd²⁺, Fe³⁺, Al³⁺, Co²⁺, Cr³⁺, Ni²⁺, Mn²⁺, Zn²⁺, Ba²⁺, Sr²⁺, Ca²⁺.
Anions: CO₃²⁻, S²⁻, SO₄²⁻, NO₃⁻, CH₂COO⁻, Cl⁻, Br⁻, I⁻, NO₂⁻, SO₃²⁻, PO₃⁻, BO₃⁻, CO₂⁻, F⁻.
(Spot tests should be carried out wherever feasible)

1. Estimation of the amount of nickel present in a given solution as bis(dimethylglyoximato)nickel(II) or aluminium as oximate in a given solution gravimetrically.
2. Drawing calibration curve (absorbance at λ_max vs. concentration) for various concentrations of a given coloured compound (KMnO₄, CuSO₄) and estimation of the concentration of the same in a given solution.
3. Determination of the composition of the Fe³⁺-salicylic acid complex solution by Job’s method.
4. Estimation of (i) Mg²⁺ or (ii) Zn²⁺ by complexometric titrations using EDTA.
5. Estimation of total hardness of a given sample of water by complexometric titration.

Physical Chemistry

I. Viscosity measurement (use of organic solvents excluded).
   i. Determination of the relative and absolute viscosity of a liquid or dilute solution using an Ostwald’s viscometer.
   ii. Studying of the variation of viscosity of an aqueous solution with concentration of solute.

II. Chemical Kinetics

   Studying the kinetics of the following reactions.
   a. Initial rate method: Iodide-persulphate reaction
   b. Acid hydrolysis of Ethyl acetate with hydrochloric acid.
   c. Saponification of ethyl acetate.
   d. Comparison of the strengths of Acids by studying kinetics of hydrolysis of ethyl acetate

Reference Books:
CORE 16: (SUPPORTIVE 4)- PHYSICS -II


UNIT-II: Gauss’s law with proof – Electric intensity and potential due to a uniformly charged hollow conductor at a point outside, on the surface and inside a spherical conductor — capacity of a parallel plate condenser with and without a dielectric slab - capacity of a spherical conductor-Biot & Savart’s law — field along the axis of a circular coil carrying current – force on current carrying conductor placed in a magnetic field – theory of moving coil galvanometer.


UNIT-V: Rectifiers & filters (qualitative ideas) – Transistor characteristics – transistor as a RC coupled amplifier – frequency response (without derivation) – band width – basic principles of an oscillator-Hartley oscillator – working (without derivation) – elementary ideas about modulation – elementary ideas about TV transmission and reception.

TEXTBOOKS:
1. Dr. Sabesan and others, A Textbook of Allied Physics-Vol-I and Vol-II.
2. Ponnusamy and others, Ancillary Physics.

REFERENCEBOOKS
PHYSICS II – PRACTICALS

Ref: Physics Practical I
CORE 17: ANALYTICAL METHODS IN CHEMISTRY

Unit I Qualitative and quantitative aspects of analysis:
Sampling, evaluation of analytical data, errors, accuracy and precision, methods of their expression, normal law of distribution if indeterminate errors, statistical test of data; F, Q and t test, rejection of data, and confidence intervals.

(5 Lectures)

Unit II Optical methods of analysis:
UV-Visible Spectrometry: Basic principles of instrumentation (choice of source, monochromator and detector) for single and double beam instrument;
Infrared Spectrometry: Basic principles of instrumentation (choice of source, monochromator & detector) for single and double beam instrument; sampling techniques. Structural illustration through interpretation of data.

Unit III Flame Atomic Absorption and Emission Spectrometry
Flame Atomic Absorption and Emission Spectrometry: Basic principles of instrumentation (choice of source, monochromator, detector, choice of flame and Burner designs. Techniques of atomization and sample introduction. Techniques for the quantitative estimation of trace level of metal ions from water samples

Unit IV Thermal and Electroanalytical methods of analysis
Theory of thermogravimetry (TG), basic principle of instrumentation. Techniques for quantitative estimation of Ca and Mg from their mixture.

(5 Lectures)

Electroanalytical methods:
Classification of electroanalytical methods, basic principle of pH metric, potentiometric and conductometric titrations. Techniques used for the determination of equivalence points. Techniques used for the determination of pKa values.

(10 Lectures)

Unit V Separation techniques
Solvent extraction: Classification, principle and efficiency of the technique. Qualitative and quantitative aspects of solvent extraction: extraction of metal ions from aqueous solution, extraction of organic species from the aqueous and nonaqueous media.
Chromatography: Classification, principle and efficiency of the technique.

(15 Lectures)

Reference Books:
CORE 18: INDUSTRIAL CHEMICALS & ENVIRONMENT

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. (10 Lectures)

Unit II Industrial Metallurgy

Chief modes of occurrence of metals based on standard electrode potentials. Ellingham diagrams for reduction of metal oxides using carbon as reducing agent.

Hydrometallurgy, Methods of purification of metals (Al, Pb, Ti, Fe, Cu, Ni, Zn): electrolytic, oxidative refining, Kroll process, Parting process, van Arkel-de Boer process and Mond’s process.

Preparation of metals (ferrous and nonferrous) and ultrapure metals for semiconductor technology. (8 Lectures)

Unit III Environment and its Segments Part A


Pollution by SO\textsubscript{2}, CO\textsubscript{2}, CO, NO\textsubscript{x}, H\textsubscript{2}S and other foul smelling gases. Methods of estimation of CO, NO\textsubscript{x}, SO\textsubscript{x} and control procedures.

Effects of air pollution on living organisms and vegetation. Greenhouse effect and Global warming, Ozone depletion by oxides of nitrogen, chlorofluorocarbons and Halogens, removal of sulphur from coal. Control of particulates. (30 Lectures)

Unit IV Environment and its Segments

Water Pollution: Hydrological cycle, water resources, aquatic ecosystems, Sources and nature of water pollutants, Techniques for measuring water pollution, Impacts of water pollution on hydrological and ecosystems.

Water purification methods. Effluent treatment plants (primary, secondary and tertiary treatment).

Industrial effluents 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 wastewater, industrial water and domestic water. (30 Lectures)

UNIT V Energy & Environment

Sources of energy: Coal, petroleum and natural gas. Nuclear Fusion / Fission, Solar energy, Hydrogen, geothermal, Tidal and Hydro, etc.

Nuclear Pollution: Disposal of nuclear waste, nuclear disaster and its management.
Biocatalysis
Introduction to biocatalysis: Importance in “Green Chemistry” and Chemical Industry.

Reference Books:
CORE 19: ORGANOMETALLICS, BIOINORGANIC CHEMISTRY, POLYNUCLEAR HYDROCARBONS AND UV, IR SPECTROSCOPY

Unit I: Chemistry of 3d metals
Oxidation states displayed by Cr, Fe, Co, Ni and Co.
A study of the following compounds (including preparation and important properties); Peroxo compounds of Cr, K₂Cr₂O₇, KMnO₄, K₄[Fe(CN)₆], sodium nitroprusside, [Co(NH₃)₆]Cl₃, Na₃[Co(NO₂)₆].

(6 Lectures)

Unit II: Organometallic Compounds
Definition and Classification with appropriate examples based on nature of metal-carbon bond (ionic, s, p and multicentre bonds). Structures of methyl lithium, Zeiss salt and ferrocene. EAN rule as applied to carbonyls. Preparation, structure, bonding and properties of mononuclear and polynuclear carbonyls of 3d metals. p-acceptor behaviour of carbon monoxide. Synergic effects (VB approach)- (MO diagram of CO can be referred to for synergic effect to IR frequencies).

(6 Lectures)

Unit III: Bio-Inorganic Chemistry
A brief introduction to bio-inorganic chemistry. Role of metal ions present in biological systems with special reference to Na⁺, K⁺ and Mg²⁺ ions: Na/K pump; Role of Mg²⁺ ions in energy production and chlorophyll. Role of Ca²⁺ in blood clotting, stabilization of protein structures and structural role (bones).

(12 Lectures)

Unit IV: Polynuclear and heteronuclear aromatic compounds and Active methylene compounds:
Polynuclear and heteronuclear aromatic compounds:
Properties of the following compounds with reference to electrophilic and nucleophilic substitution: Naphthalene, Anthracene, Furan, Pyrrole, Thiophene, and Pyridine.

Active methylene compounds:
Preparation: Claisen ester condensation. Keto-enol tautomerism.
Reactions: Synthetic uses of ethylacetoacetate (preparation of non-heteromolecules having upto 6 carbon).

(6 Lectures)

Unit V: Application of Spectroscopy to Simple Organic Molecules
Application of visible, ultraviolet and Infrared spectroscopy in organic molecules.
Infrared radiation and types of molecular vibrations, functional group and fingerprint region.
IR spectra of alkanes, alkenes and simple alcohols (inter and intramolecular hydrogen bonding), aldehydes, ketones, carboxylic acids and their derivatives (effect of substitution on >C=O stretching absorptions).

(18 Lectures)
Reference Books:

3. J.D. Lee: *A New Concise Inorganic Chemistry*, E.L.B.S.
CORE 20: CHEMISTRY LABORATORY

CHEMISTRY LABORATORY-V: INDUSTRIAL CHEMICALS & ENVIRONMENT

List of Experiments for Practical
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 (AgNO3 and potassium chromate).
8. Study of some of the common bioindicators of pollution.
10. Preparation of borax/ boric acid.

Reference Books:
6. S. M. Khopkar, Environmental Pollution Analysis: Wiley Eastern Ltd, New Delhi
CHEMISTRY LABORATORY-VI: ORGANOMETALLICS, BIOINORGANIC CHEMISTRY, POLYNUCLEAR HYDROCARBONS AND UV, IR SPECTROSCOPY

List of Experiments for Practical

Inorganic Chemistry

1. Separation of mixtures by chromatography: Measure the $R_y$ value in each case. (Combination of two ions to be given)
   - Paper chromatographic separation of Fe$^{3+}$, Al$^{3+}$ and Cr$^{3+}$ or
   - Paper chromatographic separation of Ni$^{2+}$, Co$^{2+}$, Mn$^{2+}$ and Zn$^{2+}$

2. Preparation of any two of the following complexes and measurement of their conductivity:
   (i) tetraamminecarbonatocobalt (III) nitrate
   (ii) tetraamminecopper (II) sulphate
   (iii) potassium trioxalatoferrate (III) trihydrate
   Compare the conductance of the complexes with that of M/1000 solution of NaCl, MgCl$_2$ and LiCl$_3$.

Organic Chemistry

Systematic Qualitative Organic Analysis of Organic Compounds possessing mono functional groups (-COOH, phenolic, aldehydic, ketonic, amide, nitro, amines) and preparation of one derivative.

Reference Books:

1. A.I. Vogel: Qualitative Inorganic Analysis, Prentice Hall, 7th Edn.
CORE 21: POLYMER CHEMISTRY

Unit I Introduction and importance of polymeric materials
Different schemes of classification of polymers, Polymer nomenclature, Molecular forces and chemical bonding in polymers.

Functionality and its importance:

Unit II Kinetics of Polymerization
Mechanism and kinetics of step growth, radical chain growth and coordination polymerizations, Mechanism and kinetics of copolymerization, polymerization techniques.

Unit III Structure and Morphology of Polymers
Determination of crystalline melting point and degree of crystallinity, Morphology of crystalline polymers, Factors affecting crystalline melting point.
Glass transition temperature (Tg): Determination of Tg Factors affecting glass transition temperature (Tg).

Nature and structure of polymers - Structure Property relationships.
Polymer Solutions – Criteria for polymer solubility, Solubility parameter, Thermodynamics of polymer solutions, entropy, enthalpy, and free energy change of mixing of polymers solutions, Lower and Upper critical solution temperatures.

Determination of molecular weight of polymers (Mn, Mw, etc) light scattering and osmotic pressure methods. Molecular weight distribution and its significance. Polydispersity index.

Unit V P Preparation and Properties of Polymers
Properties of Polymers (Physical, thermal, Flow & Mechanical Properties).
Brief introduction to preparation, structure, properties and application of the following polymers: polyolefins, polystyrene and styrene copolymers, poly(vinyl chloride), poly(vinyl acetate), acrylic polymers, fluoropolymers, polyamides. Phenol formaldehyde resins (Bakelite, Novolac), polyurethanes, silicone polymers, polydienes, Polycarbonates, Conducting Polymers, [polyacetylene, polyaniline, poly(p-phenylene sulphide polypyrrole, polythiophene)].

Reference Books:
CORE 22: CHEMISTRY -LABORATORY

CHEMISTRY LABORATORY-VII: ANALYTICAL METHODS IN CHEMISTRY
AND ANALYTICAL CLINICAL BIOCHEMISTRY

List of Experiments for Practical: Analytical Methods in Chemistry

I. Separation Techniques Chromatography:
   (a) Separation of mixtures
      (i) Paper chromatographic separation of Fe$^{3+}$, Al$^{3+}$, and Cr$^{3+}$.
      (ii) Separation and identification of the monosaccharides present in the given mixture
           (glucose & fructose) by paper chromatography. Reporting the $R_f$ values.

      (b) Separate a mixture of Sudan yellow and Sudan Red by TLC technique and identify
           them on the basis of their $R_f$ values.
      (c) Chromatographic separation of the active ingredients of plants, flowers and juices
           by TLC.

II. Solvent Extractions:
   1. Separation of a mixture of Ni$^{2+}$ & Fe$^{2+}$ by complexation with DMG and extracting
      the Ni$^{2+}$ DMG complex in chloroform, and determine its concentration by
      spectrophotometry.
   2. Solvent extraction of zirconium with amberlite LA-1, separation from a mixture of
      iron and gallium.
   3. Determine the pH of the given aerated drinks fruit juices, shampoos and soaps.
   4. Determination of Na, Ca, Li in cola drinks and fruit juices using flame photometric
      techniques.
   5. Analysis of soil:
      a. Determination of pH of soil.
      b. Total soluble salt
      c. Estimation of calcium, magnesium, phosphate, nitrate
   6. Ion exchange:
      a. Determination of exchange capacity of cation exchange resins and anion
         exchange resins.
      b. Separation of metal ions from their binary mixture.
      c. Separation of amino acids from organic acids by ion exchange chromatography.

III Spectrophotometry
   1. Determination of $pK_a$ values of indicator using spectrophotometry.
   2. Structural characterization of compounds by infrared spectroscopy.
   3. Determination of dissolved oxygen in water.
   4. Determination of chemical oxygen demand (COD).
   5. Determination of Biological oxygen demand (BOD).
   6. Determine the composition of the Ferric-salicylate/ ferric-thiocyanate complex by
      Job’s method.

Reference Books:
   1. Jeffery, G.H., Bassett, J., Mendham, J. & Denney, R.C. Vogel’s Textbook of
   2. Willard, H.H., Merritt, L.L., Dean, J. & Settoe, F.A. Instrumental Methods of
      Analysis, 7th Ed. Wadsworth Publishing Company Ltd., Belmont, California, USA,


List of Experiments for Practical: Analytical Clinical Biochemistry

Identification and estimation of the following:

1. Carbohydrates – qualitative and quantitative.
2. Lipids – qualitative.
3. Determination of the iodine number of oil.
4. Determination of the saponification number of oil.
5. Determination of cholesterol using Liebermann- Burchard reaction.
7. Isolation of protein.
8. Determination of protein by the Biuret reaction.
9. Determination of nucleic acids

Reference Books:

1. T.G. Cooper: Tool of Biochemistry.
8. Mikes, O. Laboratory Handbook of Chromatographic & Allied Methods, Elles
CHEMISTRY LABORATORY-VIII: POLYMER CHEMISTRY AND MOLECULAR MODELLING & DRUG DESIGN

POLYMER CHEMISTRY

List of Experiments for Practical

1. Polymer synthesis
   1. Free radical solution polymerization of styrene (St) / Methyl Methacrylate (MMA)/Methyl Acrylate (MA) / Acrylic acid (AA).
      a. Purification of monomer
      b. Polymerization using benzoyl peroxide (BPO) / 2,2’-azo-bis-isobutyronitrile (AIBN)
   2. Preparation of nylon 6,6/6
   3. Interfacial polymerization, preparation of polyester from isophthaloyl chloride (IPC) and phenolphthalein
      a. Preparation of IPC
      b. Purification of IPC
      c. Interfacial polymerization
   4. Redox polymerization of acrylamide
   5. Precipitation polymerization of acrylonitrile
   6. Preparation of urea-formaldehyde resin
   7. Preparations of novolac resin / resole resin.
   8. Microscale Emulsion Polymerization of Poly(methyl acrylate).

Polymer characterization

1. Determination of molecular weight by viscometry:
   (i) Polyacrylamide-aq.NaNO2 solution
   (ii) (Poly vinyl pyrrolidone (PVP) in water
2. Determination of the viscosity-average molecular weight of polyvinyl alcohol (PVOH) and the fraction of “head-to-head” monomer linkages in the polymer.
3. Determination of molecular weight by end group analysis: Polyethylene glycol (PEG) (OH group).
5. Determination of hydroxyl number of a polymer using colorimetric method.

Polymer analysis

1. Estimation of the amount of HCHO in the given solution by sodium sulphite method
2. Instrumental Techniques
3. IR studies of polymers
4. DSC analysis of polymers
5. Preparation of polyacrylamide and its electrophoresis

*at least 7 experiments to be carried out.

Reference Books:

John Wiley & Sons (2002)
Seymour/Carraher’s *Polymer Chemistry*, 9th ed. by Charles E. Carraher, Jr. (2013)

**MOLECULAR MODELING AND DRUG DESIGN**

**List of Experiments for Practical**

1. Comparison of the optimized C-C bond lengths in ethane, ethene, ethyne and benzene.
   Visualization of the molecular orbitals of the ethane σ bonds and ethene, ethyne, benzene and pyridine π bonds.
   (a) Performing a conformational analysis of butane.
   (b) Determination of the enthalpy of isomerization of cis and trans 2-butene.
2. Visualization of the electron density and electrostatic potential maps for LiH, HF, N2, NO and CO and comments related to the dipole moments. Animation of the vibrations of these molecules.
3. (a) Relationship between the charge on the hydrogen atom in hydrogen halides with their acid character.
   (b) Comparison of the basicities of the nitrogen atoms in ammonia, methylamine, dimethylamine and trimethylamine.
4. (a) Comparison of the shapes of the molecules: 1-butanol, 2-butanol, 2-methyl-1-propanol, and 2-methyl-2-propanol. Noting the dipole moment of each molecule.
   (b) Interpreting the relationship between shapes and their effects in the trend observed in boiling points: (118 °C, 100 °C, 108 °C, 82 °C, respectively).
5. Building and minimizing organic compounds of your choice containing the following functional groups. Note the dipole moment of each compound:
   (a) alkyl halide (b) aldehyde (c) ketone (d) amine (e) ether (f) nitrile (g) thiol (h) carboxylic acid (i) ester (j) amide.
6. (a) Determination of the heat of hydration of ethylene.
   (b) Computing the resonance energy of benzene by comparison of its enthalpy of hydrogenation with that of cyclohexene.
7. Arranging 1-hexene, 2-methyl-2-pentene, (E)-3-methyl-2-pentene, (Z)-3-methyl-2-pentene, and 2,3-dimethyl-2-butene in order of increasing stability.
8. (a) Comparing the optimized bond angles of H2O, H2S and H2Se.
   (b) Comparing the HAH bond angles for the second row dihydrides and comparing with the results from qualitative MO theory.

**Note:** Software: ChemSketch, ArgusLab (www.planaria-software.com), TINKER 6.2 (dasher.wustl.edu/ffe), WebLab Viewer, Hyperchem, or any similar software.

**Reference Books:**
PART III

BOTANY
### B.Sc., B.Ed. LIBERAL OPTIONS

#### PART III: B.Sc.B.Ed.

**Branch: BOTANY**

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CORE 1: THALLOPHYTES, MICROBES AND PLANT PATHOLOGY

Unit 1: Algae
General characteristics; Ecology and distribution; Range of thallus organization and reproduction; Classification of algae (Chapman, 1970); Morphology of the following: Nostoc, Oedogonium, Caulerpa, Sargassum, Polysiphonia. Pigments (Phycobilins) and Economic importance of algae (Biodiesel and Single Cell Protein- Spirulina).

Unit 2: Fungi
General characteristics, ecology and significance, range of thallus organization, cell wall composition, nutrition, reproduction and classification (Alexopolous and Mims, 1996); Life cycle of Dictyostelium (Mold), Mucar (Zygomycota), Aspergillus, Yeast (Ascomycota), and Agaricus (Basidiomycota).

Unit 3: Lichens and Mycorrhiza

Unit 4: Bacteria and Viruses

Unit 5: Plant Pathology
Study of diseases caused by the following: Puccinia, Colletotrichum, and Pyricularia oryzae.

Suggested Readings
CORE 2: ARCHEGONIATAE (BRYOPHYTES, PTERIDOPHYTES, GYMNOSPERMS AND PALEOBOTANY)

Unit 1: Amphibians of Plant Kingdom (12 Lectures)
Unifying features of archegoniates, Transition to land habit. Bryophytes: Alternation of generations. General characteristics, Range of thallus organization. Classification- outline (Schuster, 1966; up to family).
Morphology, anatomy and reproduction of Marchantia (Hornworts), Anthoceros (Liverworts), and Funaria (Mosses). (Developmental details not to be included). Economic importance of bryophytes.

Unit 2: Pteridophytes (14 Lectures)
General characteristics, G.M.Smith (1955) Classification(up to Class), Introduction to early land plants.
Morphology, anatomy and reproduction of Psilotum, Lycopodium, Equisetum and Marsilea. (Developmental details not to be included). Heterospory and seed habit, stelar evolution. Economic importance of Pteridophytes.

Unit 3: Gymnosperms (14 Lectures)
General characteristics, classification according to K.R.Sporne (1962; up to class). Occurrence, external morphology, anatomy and reproduction of Cycas, Pinus and Gnetum. (Developmental details not to be included).
Wood yielding gymnosperms, secondary metabolites from gymnosperms.

Unit 4: Paleobotany (12 Lectures)
General account on fossils and fossilization; kinds of preservation: compressions, coal balls, impressions, incrustations (Casts), petrifications (mineralized plants), compactions (Mummified plants), ambers. Geological time scale, computation of age of fossils(radio carbon dating).Economic importance of Fossils.

Unit 5: Fossil Botany (12 Lectures)
Detailed study of the following fossil Pteridophytes: Rhynia, Lepidodendron. Detailed study of the following fossil Gymnosperms: Calamites and Williamsonia.

Suggested Readings
CORE 3: DEVELOPMENTAL BOTANY (CELL BIOLOGY, ANGIOSPERM ANATOMY AND EMBRYOLOGY)

Unit 1: Introduction to Cell Science  
(12 Lectures)

Unit 2: Tissues and Organs  
(12 Lectures)
Root (Histogen theory) and shoot apical meristems (Tunica-Corpus theory); Simple tissue (Parenchyma, Collenchyma, Sclerenchyma) and Complex tissues (Xylem and Phloem). Primary structure of dicot and monocot root, stem and leaf. Adaptive and productive systems – epidermis, cuticle, stomata-types, guard cells, subsidiary cells.

Unit 3: Secondary Growth  
(10 Lectures)

Unit 4: Organization of Flower and Pollination  
(12 Lectures)
Structure of anther and pollen; Structure and types of ovules; Types of embryo sacs, organization and ultrastructure of mature embryo sac. Pollination mechanisms and adaptations.

Unit 5: Fertilization, Embryo and Endosperm  
(14 Lectures)
Double fertilization; Seed-structure, appendages and dispersal mechanisms. Endosperm types, structure and functions; Dicot and monocot embryo; Embryo-endosperm relationship. Apomixis and polyembryony: Definition, types and practical applications.

Suggested Readings
CORE 4 (SUPPORTIVE 1): ZOOLOGY I

UNIT I
General classification of Animal kingdom- general characteristics of Invertebrata, Chordata and Vertebrata

UNIT II
Protozan parasites of human (Entamoeba, Trypanosoma), Canal system in sponges, Polymorphism in coelenterates, Helminth parasites of human (Tapeworm, Ascaris), Coelom and its significance.

UNIT III

UNIT IV
Life cycle and retrogressive metamorphosis in Ascidia. Life cycle of Amphioxus. Life cycle of Balanoglossus and affinities.

UNIT V

Suggested Readings
ZOOLOGY I- PRACTICAL

I. Major Practical:

A. Prawn:
1. Digestive system
2. Nervous system

B. Cockroach
3. Digestive system
4. Nervous system

II. Minor Dissection and Mounting:

a) Earth worm - Body setae
b) Honey bee - Mouth parts
c) Mosquito - Mouth parts
d) Prawn - Appendages

III. Spotters:

Amoeba, Paramecium, Entamoeba, Plasmodium, Sycon, Obelia geniculata, Sea anemone on hermit crab, Aurelia, Fasciola hepatica, Taenia solium, Ascaris – Male & Female, Leech, Fresh water mussel, star fish, Amphioxus, Shark (Placoid scale), Ichthyophis, Cobra, Pigeon (feathers) and Rabbit.

IV. Submission of Record
CORE 5: MEDICINAL BOTANY

Unit 1: Introduction (10 Lectures)
Introduction- Health through herbs. Historical back ground, present status, scope of medicinal botany, Indian contribution to medicinal botany, Ethnobotany, a brief outline on traditional systems of medicine – Ayurvedha, Siddha, Unani, Naturopathy and Homeopathy.

Unit 2: Raw materials for Drugs from Plants I (10 Lectures)
Plant secondary metabolites of medical importance: source, description of the products, chemical constituents, active principles and therapeutic uses of the following:
i. **Carbohydrates** - Ispaghula (*Plantago ovata*), Agar (*Gracilaria*).
   ii. **Glycosides** - Senna (*Cassia* sp), Digitalis, Glycorrhiza and Aloe.

Unit 3: Raw materials for Drugs from Plants II (16 Lectures)
Plant secondary metabolites of medical importance: source, description of the products, chemical constituents, active principles and therapeutic uses of the following:
i. **Tannins** - Acacia and Myrobalan (*Terminlia chebula*).
   ii. **Fixed oils** - Groundnut oil (*Arachis hypogea*) and Castor oil (*Ricinus communis*).
   iii. **Volatile oils** - Eucalyptus, Clove, lemon and Ocimum.
   v. **Alkaloids** - Cinchona, Rauwolfia, Atropa, Opium, Vasaka (*Adhatoda zeylanica*) and Ephedra.
   vi. **Steroids** – Solanum and Dioscorea.

Unit-4: Plant Toxins (6 Lectures)
Toxins of plant origin: Allergens, Teratogens and hallucinogens from hemp and mycotoxins and aflatoxins from fungi.

Unit-5: Antibiotics (12 Lectures)
Introduction to Antibiotics: Properties and Functions of antibiotics. Extraction, chemistry and therapeutic uses of the antibiotics obtained from *Penicillium*, *Aspergillus*, and *Streptomyces*. General account on neutraceuticals and cosmoceuticals.

Suggested Readings
CORE 6: FIELD BOTANY (ECOLOGY AND ANGIOSPERM TAXONOMY)

Unit 1: Introduction and Ecological factors (12 Lectures)

Unit 2: Plant communities and Ecosystem (12 Lectures)
Characters; Ecotone and edge effect; Succession; Processes and types. Structure; energy flow trophic organisation; Food chains and food webs, Ecological pyramids, production and productivity; Biogeochemical cycle; Cycle of carbon, nitrogen and phosphorous. Principles of biogeographical zones; Endemism.

Unit 3: Angiosperm Taxonomy- Introduction and Identification (10 Lectures)
Classification, Nomenclature and Identification.
Functions of Herbaria, important herbaria and botanical gardens of the world and India (BSI); Documentation: Flora, Keys (Indented and Bracketed).
Ranks, categories and taxonomic groups. Principles and rules (ICBN); binominal system, typification, author citation, effective and valid publication, rejection of names, principle of priority and its limitations.

Unit 4: Angiosperm Classification and Polypetalae Families (14 Lectures)
Types of classification- artificial, natural and phylogenetic. Bentham and Hooker (up to series), Engler and Prantl (upto series/ order).
Study of the following Polypetalae families and their economic importance: Annonaceae, Rutaceae, Anacardiaceae, Fabaceae, Caesalpiniaceae, Mimosaceae and Cucurbitaceae.

Unit 5: Gamopetalae, Monochlamydeae and Monocot Families (12 Lectures)
Study of the following Gamopetalae families and their economic importance: Asteraceae, Asclepiadaceae, Solanaceae, Lamiaceae.
Study of the following Monochlamydeae family and their economic importance: Euphorbiaceae.
Study of the following Monocot families and their economic importance: Liliaceae, and Poaceae.

Suggested Readings
CORE 7: BOTANY LABORATORY

BOTANY LABORATORY - I

THALLOPHYTES, MICROBES AND PLANT PATHOLOGY - PRACTICAL

1. Study of vegetative and reproductive structures of *Nostoc, Volvox* (electron micrographs), *Oedogonium, Caulerpa, Sargassum* and *Polysiphonia* through temporary preparations and permanent slides.
2. *Rhizopus* and *Penicillium*: Asexual stage from temporary mounts and sexual structures through permanent slides.
4. *Agaricus*: Sectioning of gills; Culture.
5. Lichens: Study of growth forms of lichens (crustose, foliose and fruticose).
7. Study of the following diseases: *Puccinia, Colletorichum* and *Pyricularia oryzae*.

ARCHEGONIATAE (BRYOPHYTES, PTERIDOPHYTES, GYMNOSPERMS AND PALEOBOTANY) - PRACTICAL

External and internal morphology of the following plants:
1. *Anthoceros*.
2. *Marchantia*.
3. *Funaria*.
4. *Psilotum*.
5. *Lycopodium*.
7. *Marsilea*.
8. *Cycas*.
10. *Gnetum*.
BOTANY LABORATORY - II

DEVELOPMENTAL BOTANY (CELL BIOLOGY, ANGIOSPERM ANATOMY AND EMBRYOLOGY)- PRACTICAL
1. To study eukaryotic cells with the help of light and electron micrographs.
2. Study of the photomicrographs of cell organelles.
3. To study the structure of plant cell through temporary mounts.
4. Study of mitosis and meiosis (temporary mounts and permanent slides).
5. Study of meristems through permanent slides and photographs.
6. Tissues (parenchyma, collenchyma and sclerenchyma); Macerated xylary elements, Phloem (Permanent slides, photographs)
9. Leaf: Dicot and Monocot leaf (sections).
10. Structure of anther (young and mature), tapetum (amoeboid and secretory) (sections).
11. Types of ovules: anatropous, orthotropous, circcinotrropous, amphitropous/campylotropous.
12. Female gametophyte: Polygonum (monosporic) type of Embryo sac Development (Permanent slides/photographs).
14. Pollination types and seed dispersal mechanisms (including appendages, aril, caruncle) (Photographs and specimens).
15. Dissection of embryo/endosperm from developing seeds.

MEDICINAL BOTANY- PRACTICAL
1. Morphological and anatomical studies of crude drugs of plants included in the syllabus.
2. Identification of crude drugs by histochemical and phytochemical methods.
3. Identification of drug adulterants.

FIELD BOTANY (ECOLOGY AND ANGIOSPERM TAXONOMY)- PRACTICAL
1. Study of instruments used to measure microclimatic variables: Soil thermometer, maximum and minimum thermometer, anemometer, psychrometer/ hygrometer, rain gauge and lux meter.
2. Determination of pH, and analysis of two soil samples for carbonates, chlorides, nitrates, sulphates, organic matter and base deficiency by rapid field test.
3. (a) Study of morphological adaptations of hydrophytes and xerophytes (four each). (b)Study of biotic interactions of the following: Stem parasite (Cuscuta), Root parasite (Orobanche), Epiphytes, Predation (Insectivorous plants).
4. Determination of minimal quadrat size for the study of herbaceous vegetation in the college campus by species area curve method (species to be listed).
5. Quantitative analysis of herbaceous vegetation in the college campus for frequency and comparison with Raunkiaer’s frequency distribution law.
6. Study of vegetative and floral characters of the families mentioned in the theory (Description, L.S. of flower, section of ovary, floral diagram/s, floral formula/e and systematic position according to Bentham & Hooker’s system of classification).
7. Mounting of a properly dried and pressed specimen of any ten plant species with herbarium label (to be submitted along with Field Note).
8. Study tour (female staff should accompany girl students).
CORE 8 (SUPPORTIVE 2) ZOOLOGY II- THEORY

Unit – I: Biodiversity and Human Welfare
Threats to Biodiversity - Habitat loss and Man-Wildlife conflict. National parks, Sanctuaries and Biosphere reserves

Unit – II:
Animal husbandry: Breeds of cattle- milk breeds- draft breeds- Dairy and Dairy products

Unit – III:
Culture: Vermiculture, Apiculture, Pisciculture and Poultry

Unit – IV
Communicable and non-communicable diseases
Tuberculosis and Typhoid; Hepatitis (A and B), AIDS, Gonorrhea and Syphilis Diseases of respiratory system- Asthma, Bronchitis.
Oral Cancer - cause/causeative agents, symptoms, diagnostics, precaution /prevention and remedy.

Unit – V
Non – Communicable Diseases
Stress related disorders, Hypertension, Diabetes type II, anxiety, insomnia, migraine, depression (cause, symptoms, precaution and remedy)

Suggested Readings

5. Medical Biochemistry- Ambika Shanmugam.
ZOOLOGY- II- PRACTICAL

1. Study of animals in Nature/National park

2. Study of various breeds of cattle.

3. Visit to a Fish culture pond.


5. Identification of parasites related to syllabus
CORE 9: ECONOMIC BOTANY

Unit 1: Origin of Crop Plants (16 Lectures)
Introduction to Economic Botany. Vavilov’s centres of origin of crop plants. Origin, distribution, brief idea of cultivation and economic uses of the following Food plants:
   i. Cereals (rice, wheat and maize)
   ii. Pulses (gram, arhar and pea)
   iii. Vegetables (potato, tomato and onion)

Unit 2: Fibre Plants (10 Lectures)
Origin, distribution, brief idea of cultivation and economic uses of the following Fibre plants:
   i. Cotton
   ii. Jute
   iii. Flax

Unit 3: Timber Plants (10 Lectures)
Origin, distribution, brief idea of cultivation and economic uses of the following Timber plants:
   (i) Neem
   (ii) Teak
   (iii) Cedar

Unit 4: Oil Plants (12 Lectures)
Origin, distribution, brief idea of cultivation and economic uses of the following Oil plants:
   i. Groundnut
   ii. Sunflower
   iii. Coconut

Unit 5: Spices and Condiments (12 Lectures)
Origin, distribution, brief idea of cultivation and economic uses of the following Spices:
   i. Coriander
   ii. Clove
   iii. Ginger

Suggested Readings:
CORE 10: MOLECULAR BIOLOGY - THEORY

Unit 1: The Genetic Material (14 Lectures)

Unit 2: Replication and Transcription of DNA (14 Lectures)

Unit 3: Protein synthesis (8 Lectures)
Translation- features of genetic code- Wobble hypothesis, role of t-RNA and ribosomes. Initiation, elongation and termination- peptidyl transferase.

Unit 4: Gene Regulation Gene Mutation (12 Lectures)
Regulation of gene expression- regulation at transcriptional level. Lac Operon- negative and positive control. Gene mutation- frame shift, substitution mutation, tautomerization, depurination, base analogues, chemical and physical mutagens.

Unit 5: Polymerase chain reaction (12 Lectures)

Suggested Readings
CORE 11: PLANT PHYSIOLOGY AND BIOCHEMISTRY - THEORY

Unit 1: Plant-water relations and Mineral Nutrition (16 Lectures)
Water as a universal solvent. Water potential and its components. Factors affecting transpiration; Root pressure and guttation. Essential growth elements, macro and micronutrients; Criteria of essentiality of elements; Role of essential elements; Transport of ions across cell membrane (active and passive transport), carriers, channels and pumps.

Unit 2: Carbohydrates and Lipids (14 Lectures)

Unit 3: Photosynthesis and Translocation of solutes (14 Lectures)
Photosynthetic Pigments (Chl a, b, xanthophylls, carotene); Photosystem I and II, reaction center, antenna molecules; Electron transport and mechanism of ATP synthesis; C3, C4 and CAM pathways of carbon fixation; Transpiration- Ascent of sap (Cohesion and Tension hypothesis) and its significance. Composition of phloem sap, girdling experiment; Pressure flow model; Phloem loading and unloading.

Unit 4: Amino acids, Proteins and Enzymes (10 Lectures)

Unit 5: Environmental Plant Physiology (6 Lectures)
Photoperiodism (SDP, LDP, Day neutral plants); Phytochrome (discovery and structure), red and far red light responses on photomorphogenesis. Vernalization. Phytohormones (natural Auxins and Gibberellins). Plant Stress- definition. Plant responses to Abiotic Stresses: - cold, drought, salt and UV.

Suggested Readings
CORE 12 (SUPPORTIVE 3): CHEMISTRY-I

Unit 1
Intermolecular forces - Vanderwall and London forces. Liquid state theory and properties of liquids, liquid-crystal formation and applications. Solid state- forces in solids- covalent, ionic, metallic, and Vanderwall’s, Lattice energy.

Unit 2

Unit 3
Covalent bond- Orbital Overlap- hybridization, geometry of organic molecules- methane, ethylene, acetylene, benzene. Electron displacement effects, inductive, resonance, hyperconjugative and steric effects-their effect on properties of compounds. Stereoisomerism- Optical isomerism-optical activity, lactic acid, tartaric acid, racemization, resolution.

Unit 4:
Aromatic compounds-electrophilic substitution in benzene, mechanism of nitration, halogenation, Alkylation and Acylation. Preparation, properties and uses of Naphthalene, Furan, Thiophene, Pyrrole, Pyridine, Chloroform and Carbon Tetrachloride.

Unit5:

Text books:
CHEMISTRY PRACTICALS I

1. Estimation of sodium hydroxide using sodium carbonate standard.
2. Estimation of hydrochloric acid using oxalic acid standard.
5. Estimation of oxalic acid using ferrous sulphate standard.
6. Preparation of the following inorganic compounds: ferrous ammonium sulphate, manganous sulphate, sodium thiosulphate.
CORE 13: MUSHROOM CULTURE – THEORY

Unit 1: History of Mushroom Culture  (12 Lectures)
Mushroom as food. Medicinal value of edible mushrooms; Poisonous mushrooms. Types of edible mushrooms available in India – *Volvariella volvacea*, *Pleurotus citrinopileatus*, *Agaricus bisporus*.

Unit 2: Infrastructure and Inputs  (12 Lectures)
Mushroom Cultivation: Infrastructure and implements-mushroom sheds, design, conditions, materials- Factors influencing mushroom cultivation.

Unit 3: Stages in Mushroom Production  (12 Lectures)

Unit 4: Harvest and Storage  (12 Lectures)

Unit 5: Mushroom Recipes  (12 Lectures)

Suggested Readings
CORE 14: BIOFERTILIZERS AND ORGANIC FARMING – THEORY

Unit 1: Manures and Biofertilizers (10 Lectures)

Unit 2: Bacterial Biofertilizers (14 Lectures)
General account on the microbes used as biofertilizer. Azotobacter: classification, characteristics—crop response to Azotobacter inoculum, maintenance and mass multiplication. Rhizobium – isolation, identification, mass multiplication, carrier based inoculants, Actinorhizal symbiosis.

Unit 3: Algal Biofertilizers (12 Lectures)

Unit 4: Fungal Biofertilizers (12 Lectures)

Unit 5: Organic Farming (12 Lectures)
Organic farming – Green manuring and organic fertilizers, Recycling of bio-degradable municipal, agricultural and industrial wastes, Biocompost making- types, method of vermicomposting, Panchakavya. Biological pest control (neem)

Suggested Readings
CORE 15: BOTANY LABORATORY

BOTANY LABORATORY-III

ECONOMIC BOTANY – PRACTICAL

1. Study of morphological features of food plats, vegetables, fibre yielding plants, oil yielding plants, Spices and Condiments.
2. Study of anatomical features of Coriander, Clove, Ginger Azadirachta, Withania.
3. Histochemical localization starch in rice and potato.
4. Economic significance of tea, coffee, rubber, sugarcane

MOLECULAR BIOLOGY- PRACTICAL

1. Isolation of DNA from plant tissues.
2. Isolation of RNA from plant tissues.
3. Isolation of bacterial plasmids.
4. Separation of DNA by Agarose gel electrophoresis.
5. Separation of RNA by Agarose gel electrophoresis.
6. Staining of nucleic acid in vivo (Giemsa stain).
**BOTANY LABORATORY-IV**

**PLANT PHYSIOLOGY AND BIOCHEMISTRY - PRACTICAL**

1. Determination of osmotic potential of plant cell sap by plasmolytic method.
2. To study the effect of two environmental factors (light and wind) on transpiration by excised twig.
3. Calculation of stomatal index and stomatal frequency of a mesophyte and a xerophyte.
4. Demonstration of Hill reaction.
5. Demonstration of the activity of catalase and study of the effect of pH and enzyme concentration.
6. To study the effect of light intensity and bicarbonate concentration on O2 evolution in photosynthesis.
7. Comparison of the rate of respiration in any two parts of a plant.
8. Separation of amino acids by paper chromatography.

**MUSHROOM CULTURE - PRACTICAL**

10. Sterilization of paddy straw.
11. Preparation of bed inside the polythene bags and incubation of bags.
12. Preparation of spawn.
13. Visit to a mushroom culture unit/industry

**BIOFERTILIZERS AND ORGANIC FARMING – PRACTICAL**

1. Isolation and culture of *Rhizobium* and Algae.
3. Mass cultivation of *Azolla*.
4. Isolation and culture of VAM.
CORE 16 (SUPPORTIVE 4): CHEMISTRY-II

Unit 1:
Co-ordination chemistry – definition of terms, classification of ligands, nomenclature. Chelation – examples, chelate effect explanation. Werner’s theory- conductivity and precipitation studies. Sedgwick’s theory- Effective atomic number concept. Pauling’s theory- postulates, applications to octahedral, square, planar and tetrahedral complexes.

Unit 2:

Unit 3:

Unit 4:

Unit 5:

Text books:
CHEMISTRY II PRACTICAL

1. Detection of elements – nitrogen, sulphur and halogens.
2. Preliminary test and detection of carbohydrate, urea, benzamide and aromatic amines.
4. Reaction of aldehyde (aromatic), ketone (aliphatic and aromatic), carbohydrate, carboxylic acid (mono- and dicarboxylic-), phenol, aromatic primary amine, amide and diamide.
5. Systematic analysis of organic compounds containing one functional group and characterization by confirmatory tests or derivatives.
CORE 17: BIOSTATISTICS AND COMPUTER APPLICATIONS IN BIOLOGY

Unit 1: Biostatistics-I  
(12 Lectures)
Introduction to Biostatistics, definition, characteristics, importance and usefulness, limitations. Collection, classification and presentation of data (tabulation, graphical representation-Histogram, simple bar, multiple bar and divided bar diagrams, pie diagram, frequency curve and frequency polygon). Frequency distribution: definition, types, class width, class mark, class frequency, relative frequency, percentage frequency and frequency density.

Unit 2: Biostatistics-II  
(12 Lectures)

Unit 3: Basics of Computer  
(12 Lectures)
Types of computers, accessories and its functions, input-output devices, concepts of different operation systems, details of Networks, Internet and email. Database types and its uses, fundamentals of digital imaging, uses of different programming languages.

Unit 4: Softwares used in Biology  
(12 Lectures)
Outline of MS-Office (MS-Word, MS-Excel and MS-Power point). Database softwares: MS access, Image editing softwares (Photoshop), Biological Sequence Searching and Comparison softwares (BLAST), Search engines (Google, Mozilla Firefox), GIS softwares (Google Earth).

Unit 5: Computer Applications in Biology  
(12 Lectures)

Suggested Readings
8. PSPP Tutorial. https://www.youtube.com/watch?v=GG-wbMS9i7g
11. EMBL Nucleotide Sequence Database http://www.ebi.ac.uk/
CORE 18: PLANT BIOTECHNOLOGY- THEORY

Unit 1: Plant Tissue Culture, Design of Lab and Media  (12 Lectures)

Unit 2: Types of Tissue Cultures- I and Secondary metabolites  (12 Lectures)
Callus culture and cell suspension culture. Direct and indirect organogenesis.Somaclonal variations and their uses in agriculture. Basics of Secondary metabolite production of Shikonin from Lithospermum erythrorhizon; Morphine from Papaver somniferum; Vincristine from Catharanthus roseus.

Unit 3: Types of Tissue Cultures- II  (12 Lectures)

Unit 4: Genetic Engineering and Cloning Vectors  (12 Lectures)
Principles and tools of genetic engineering: Restriction endonucleases- Type II enzymes; nomenclature. DNA ligase and DNA Polymerases. Cloning Vectors –Bacterial vectors (pBR322, pUC8), Viral vectors (M13, λ phage), Hybrid vectors (cosmids), Artificial Chromosomes (Bacterial and Yeast).

Unit 5: Transgenic Plants, Bioethics and Biosafety  (12 Lectures)

Suggested Readings
CORE 19: HORTICULTURE- THEORY

Unit 1: Landscaping and Gardening (12 Lectures)
Plants of aesthetic interest. Gardening types. Importance and classification of horticultural crops - their culture and nutritive value, area and production, exports and imports, fruit and vegetable zones of India and of different states, nursery management practices, soil and climate. Irrigation, fertilizer application, pest and diseases.

Unit 2: Orchard and Kitchen Garden Layout (12 Lectures)
Vegetable gardens, nutrition and kitchen garden and other types of gardens – principles, planning and layout, management of orchards, planting systems and planting densities. Rejuvenation of old orchards, top working, frame working, principles of organic farming.

Unit 3: Nursery and Canopy Management (12 Lectures)
Production and practices for fruit, vegetable and floriculture crops, propagation - cutting, layering, grafting. Principles and methods of pruning.

Unit 4: Cropping Systems (12 Lectures)
Types and use of growth regulators in horticulture, water management, weed management, fertility management, cropping systems: intercropping, multi-tier cropping, mulching, bearing habits, factors influencing the fruitfulness and unfruitfulness.

Unit 5: Disease Control and Pest Management
Horticultural crop diseases by:
(i) Rodents
(ii) Viruses
(iii) Insects

Suggested Readings
CORE 20: PLANT TISSUE CULTURE - THEORY

Unit 1: Introduction and History (6 Lectures)
History of Plant Tissue Culture (PTC). Totipotency, Dedifferentiation, Redifferentiation.

Unit 2: Culture Media (14 Lectures)

Unit 3: Sterilization Procedures (14 Lectures)

Unit 4: In Vitro Cultures
Callus induction, Cell suspension cultures, Somatic embryogenesis- artificial seeds. Somaclonal variations.
Micropropagation using meristems and nodal explants.
Haploid plant production through androgenesis and gynogenesis. Embryo and endosperm culture with their applications.

Unit 5: Applications of PTC (12 Lectures)
Secondary metabolites production in cultures. Production of plumbagin from Plumbago zeylanica, vincristine from Catherathus roseus, azadiractin from Azadirachta indica.
Applications of plant tissue cultures in Agriculture.

Suggested Readings
CORE 21: ETHNOBOTANY - THEORY

Unit 1: Ethnobotany (12 Lectures)
Introduction, concept, scope and objectives; Ethnobotany as an interdisciplinary science. The relevance of ethnobotany in the present context; Major and minor ethnic groups or Tribals of India, and their life styles. Plants used by the tribals: (a) Food plants (b) intoxicants and beverages (c) Resins and oils and miscellaneous uses.

Unit 2: Methodology of Ethnobotanical Studies
(a) Field work (b) Herbarium (c) Ancient Literature (d) Archaeological findings (e) temples and sacred places.

Unit 3: Role of Ethnobotany in Modern Medicine (16 Lectures)
Medico-ethnobotanical sources in India; Significance of the following plants in ethnobotanical practices (along with their habitat and morphology) (a) Azadirachta indica (b) Ocimum sanctum (c) Vitex negundo. (d) Gloriosa superba(e) Tribulus terrestris (f) Pongamia pinnata (g) Cassia auriculata (h) Indigofera tinctoria. Role of ethnobotany in modern medicine with special example Rauvolfia sepentina, Trichopus zeylanicus, Artemisia annua, Withania somnifera.

Unit 4: Conservation of Plant Genetic Resources (12 Lectures)
Role of ethnic groups in conservation of plant genetic resources. Endangered taxa and forest management (participatory forest management).

Unit 5: Ethnobotany and Legal Aspects (12 Lectures)
Ethnobotany as a tool to protect interests of ethnic groups. Sharing of wealth concept with few examples from India. Biopiracy, Intellectual Property Rights and Traditional Knowledge Patent

Suggested Readings
CORE 22: BOTANY LABORATORY

BOTANY LABORATORY-V

BIOSTATISTICS AND COMPUTER APPLICATIONS IN BIOLOGY- PRACTICAL

1. Tabulation of biological data.
2. Calculation of mean, median, mode, standard deviation and standard error using biological data.
3. To plot and import Graphs and Charts using biological and statistical data in MS-office.
4. Search biological information (texts and images) using Internet.
5. Biological sequence searching using BLAST software.

PLANT BIOTECHNOLOGY- PRACTICAL

2. Sterilization and inoculation of explants on culture media.
3. Callus culture.
4. Micropropagation (axillary bud or terminal bud).
5. Anther and Ovary culture.
6. Protoplast isolation and culture- demonstration.
7. Identification of photographs pertaining to chapters mentioned in the theory.
8. Identification of Crown gall disease by specimen or photograph.

HORTICULTURE- PRACTICAL

1. Vegetable gardening.
3. Pruning of crop plants.
BOTANY LABORATORY-VI

PLANT TISSUE CULTURE – PRACTICAL

1. Sterilization of glassware and culture media.
2. Preparation of MS medium.
3. Surface sterilization of explants.
4. Callus induction
5. Micropropagation using nodal explants and shoot tip explants.
6. Anther culture.

ETHNOBOTANY- PRACTICAL

1. Field visit to meet ethnic people of hills and preparation and submission of report on Botanical names, vernacular name, family, uses of plants for traditional medicines.
2. Preparation of 5 Herbarium of ethnobotanically important plants.
3. Study of habitat of ethnobotanical plants mentioned in theory.
4. Study of morphology of plants used in traditional medicine.
PART III

ZOOLOGY
# B.Sc., B.Ed. LIBERAL OPTIONS

**PART III: B.SC.B.ED.**

**Branch: ZOOLOGY**

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CORE 1: BIODIVERSITY OF INVERTEBRATES

Objectives:
1. To understand Biodiversity, Habitat, Adaptation organization and taxonomic status of invertebrates.
2. Explaining the basic aspects of classification, structural and functional details of Invertebrates.

Unit I:
PROTOZOA: General characters and classification up to classes with suitable examples of Indian context. Type study – Paramecium
PORIFERA: General characters and classification up to classes with suitable examples of Indian context. Type study – Leucosolenia

Unit II:
COELENTERATA: General characters and classification up to classes with suitable examples of Indian context. Type study – Obelia,
CTENOPHORA: Classification, Salient features with suitable examples of Indian context.

Unit III:
PLATYHELMINTHES: General characters and classification up to classes with suitable examples of Indian context. Type Study: Taenia solium
ASCHELMINTHES: General characters and classification up to classes with suitable examples of Indian context. Type study: Ascaris lumbricoidus

Unit IV:
ANNELIDA: General characters and classification up to classes with suitable examples of Indian context. Type study; Nereis
ARTHROPODA: General characters and classification up to classes with suitable examples of Indian context. Type study; Penaeus monodon

Unit V:
MOLLUSCA: General characters and classification up to classes with suitable examples of Indian context. Type study; Unio
ECHINODERMATA: General characters and classification up to classes with suitable examples of Indian context. Type study; Asterias.

Suggested Readings
CORE 2: BIODIVERSITY OF CHORDATES AND VERTEBRATES

Objectives: To discuss habitat, adaptations and organization of chordates.

UNIT – I
Salient Features of Phylum Chordata.

PROCHORDATA:
Characteristics and classification of Prochordata up to order level with examples Type study: Ascidia
General topic: Origin of Chordata.

UNIT – II PISCES
General characters and classification up to orders with examples Type study: Shark. (without endoskeleton)
General Topic: Accessory respiratory organs in fishes,

AMPHIBIA
General characters and classification up to orders with examples Type study: Frog (without endoskeleton)
General Topic: Parental care in Amphibians

UNIT – III REPTILIA
General characters and classification up to orders with examples Type study – Calotes. (without endoskeleton)
General Topic: Identification of poisonous and non-poisonous snakes.

UNIT – IV AVES
General characters and classification up to orders with examples Type study – Pigeon (without endoskeleton)

UNIT – V MAMMALIA
General characters and classification up to orders with examples Type study – Rabbit (without endoskeleton)
General Topic: Aquatic Mammals.

Suggested Readings
CORE 3: ANIMAL PHYSIOLOGY

Objectives: Explaining various aspects of physiological activities of animals with special reference to mammals.

UNIT – I
Nutrition: Types of nutrition, Food and feeding mechanisms, Digestive enzymes and their role in digestion,

UNIT – II
Respiration: Respiratory organs, Respiratory pigments and functions. Transport of gases (Co2 and O2) - Chloride Shift, Haldane and Bohr’s effect
Circulation: Composition, properties and functions of Blood, Mechanism of blood clotting, Structure of human heart- Cardiac cycle, Origin of heart beat, Pace maker, Regulation of heart beat, ECG, Blood Pressure, Arrhythmias

UNIT – III
Excretion: Kidney, Nephron - structure and mechanism of urine formation in mammals,.. Osmo ionoregulation and thermoregulation

UNIT – IV
Muscle Physiology: Types of muscles, Structure and chemical composition of skeletal muscle, Mechanism of muscle contraction

UNIT -V
Receptors: Photoreceptor – Structure of a mammalian eye, Retina – visual pigments, Physiology of vision. Phonoreceptor – Structure of mammalian ear, Mechanism of hearing, Physiology of equilibrium, Chemoreceptors

Suggested Readings

2. Parameswaran, Anantakrishnan and Ananta Subramanyam, 1975. Outlines of Animal Physiology,
CORE 4: (SUPPORTIVE 1) BOTANY I- THEORY

(Bacteria, Algae, Fungi, Archegoniatae, Angiosperms and Economic Botany)

Unit I: Monerans (12 Lectures)
Salient features of bacterium and cyanobacterium. Ultrastructure and reproduction of 
*Escherichia coli* and *Nostoc*.

Unit II: Algae and Fungi (12 Lectures)
General characters of Algae and Fungi. Study of structure and reproduction of *Volvax* and 
*Oedogonium*, *Aspergillus* and *Puccinia*.

Unit III: Archegoniatae (12 Lectures)
Salient features of Bryophytes, Pteridophytes and Gymnosperms. Structure, reproduction and 
life cycle of the following genera: *Marchantia*, *Selaginella* and *Pinus*.

Unit IV: Angiosperms (12 Lectures)
Introduction to flower, fruit and seeds. Study of Angiospermic families: Annonaceae, 
Asclepiadaceae, Nyctaginaceae and Poaceae.

Unit V: Economic Botany (12 Lectures)
Binomial, family and morphology of the useful parts of the following categories: Cereals(rice, 
wheat, barley), Millets (finger millet, pearl millet, broom-corn), Pulses (green gram, ground 
nut, soya bean), Oils (sunflower, coconut, gingelly), Spices (clove, pepper, cardamom), 
Beverages (cocoa, tea, coffee) and Medicines (*Adhatoda*, ginger, *Aloe*).

Suggested Readings
Chand and Company Ltd. New Delhi.
S.Chand and Company Ltd. New Delhi.
and Company Ltd. New Delhi.
Company Ltd. New Delhi.
BOTANY I- PRACTICAL

(Bacteria, Algae, Fungi, Archegoniatae, Angiosperms and Economic Botany)

1. Study of genera included in Unit I, II and III.
2. Study of families included in Unit IV.
3. Study of products of economic importance included in Unit V.
CORE 5: MICROBIOLOGY

Objectives: To emphasize the importance of integrating new knowledge on Microorganisms.

UNIT-I
Scope of Microbiology
Diversity of Microbes, Broad classification of bacteria, fungi, yeast and virus. Structure and functions of bacteria and virus, Bacterial Culture – Media & types.

UNIT-II
Microbes of the Environment
Air, Water and Soil and its role in ecosystem, Role of Microbes in Ecosystem Bioremediation of industrial wastes, sewage treatment plants,

UNIT-III
Agricultural Microbiology
Microorganisms as biofertilizers, production and application of. Microbial biopesticides; Mechanism of N2 fixation.

UNIT -IV
Food Microbiology:
Microbes of milk and food, Pasteurization and food spoilage. Fermentation techniques and Production of alcohol. Uses of microbes in food Industry - Bread, Vinegar,

UNIT- V
Microbial Control
Concept of Sterilization pasteurization, tyndalization; fumication, ultrasonication, and filtration.

Suggested Readings
CORE 6: DEVELOPMENTAL BIOLOGY

Objectives:
To understand ontogenesis, the development of animals including parthenogenesis and to study embryonic adaptations, human reproduction and reproductive technology in man.

UNIT – I
Theories of developmental biology; Gametogenesis – Spermatogenesis and Oogenesis Types of eggs and egg membranes ; Fertilization – External and internal fertilization, sperm – egg interaction, physiological changes in the organization of egg cytoplasm, theories of fertilization. Parthenogenesis ,types -. Natural and artificial parthenogenesis.

UNIT – II
Cleavage
Types, Patterns and factors affecting cleavage; Types of blastula Blastulation and Gastrulation in frog and chick, Fate maps in frog and Morphogenetic movements.

UNIT – III
Tubulation
Neurulation and organogenesis : Development of brain, eye , heart in frog ; Extra-embryonic membranes. Placentation in mammals.

UNIT-IV

UNIT V

Suggested Readings
CORE 7: ZOOLOGY LABORATORY

ZOOLOGY LABORATORY- I

BIODIVERSITY OF INVERTEBRATES-PRACTICAL

I. DISSECTION
A. Prawn:
   1. Digestive system
   2. Nervous system
B. Cockroach
   3. Digestive system
   4. Nervous system
   5. Male Reproductive system
   6. Female Reproductive system

II. MOUNTING
7. Earth worm- Body setae and Penial setae
8. Mouth parts of Mosquito
9. Sting apparatus of Honey bee
10. Prawn appendages:

III – SPOTTERS ( any 30 spotters)
A- Classify giving reasons up to order:
   1. Paramecium
   2. Scypha
   3. Aurelia
   4. Fasciola
   5. Ascaris
   6. Neanthes
   7. Penaeus
   8. Lamellidens
   9. Asterias

B- Draw labeled sketches:
   10. L.S. Sponge
   11. Obelia medusa
   12. Physalia
   13. Ephyra larva
   14. Redia larva
   15. Cercaria larva
   16. Mysis larva

   17. Alima larva
   18. Bipinnaria larva

C- Comment on Biological significance:
   19. Entamoeba
   20. Paramecium – Conjugation
   21. Plasmodium
   22. Obelia colony
   23. Velella
   24. Fasciola – Miracidium
   25. Taenia – Mature proglottid
   26. Ascaris
   27. Heteronereis
   28. Trochophore larva
   29. Chaetopterus
   30. Peripatus
   31. Hirudinaria
   32. Limulus
   33. Nauplius larva
   34. Zoea larva
   35. Chiton
   36. Sepia
   37. Octopus
   38. Sacculina on crab
   39. Sea anemone on Hermit crab

D – Relate structure and function:
   40. Sponge – Spicules
   41. Sponge – Gemmule
   42. Taenia – Scolex
   43. Neanthes – Parapodium
   44. Earth worm – Penial setae
   45. Penaeus – Petasma
   46. Honey bee – Sting apparatus
   47. Scorpion – Book – lung
   48. Starfish – Pedicellaria
   49. Starfish - Tube foot.
Biodiversity of Chordates and Vertebrates Practical

I. Dissection
Fish: Digestive, Nervous system, Male and female Reproductive system

II. Mounting
1. Scoliodon: Placoid scales.
2. Mugil: Ctenoid scales.

III - Spotters (any 30 spotters)
A. Classify giving reasons up to order:
1. Balanoglossus
2. Herdmania (=Ascidian)
3. Branchiostoma (=Amphioxus)
4. Petromyzon
5. Scoliodon sorrakowah
6. Mugil oeur
7. Rana hexadactyla
8. Calotes versicolor
9. Columba livia
10. Oryctolagus cuniculus

B. Draw labeled sketches:
12. Doliolum
13. Salpa
14. Arboreesant organ of catfish
15. Accessory respiratory organ of Anabas
16. Flight muscle of Birds

17. Poisonous apparatus of Snake
18. Narcine
19. Naja naja
20. Typhlops

C. Comment on Biological significance:
21. Tornaria larva
22. Ascidian Tadpole larva
23. Anabas scandens
24. Hippocampus
25. Echeneis
26. Rhacophorus
27. Ichthyophis
28. Amblystoma
29. Axolotle larva
30. Chamaeleon
31. Vipera russelli (=Russel’s viper)
32. Draco volans
33. Bat

D. Relate structure and function:
34. Fish - air bladder
35. Fang of Snake
36. Placoid-Scale of Shark.
37. Filter feeding structure of Whale-Balen plates
38. Quill Feather of pigeon
39. Aquatic mammals- limbs
40. Contour feather
ZOOLOGY LABORATORY - II

ANIMAL PHYSIOLOGY PRACTICAL
1. Qualitative detection of human salivary amylase in relation to either pH or temperature.
3. Detection of nitrogenous waste products (Ammonia, urea and uric acid). in fish tank water, frog tank water, bird excreta and mammalian urine/ Kidney.
4. Estimation of Haemoglobin from Human Blood
5. Determination of blood clotting time
6. Calculation of Body Mass Index (BMI)
7. Estimation of Erythrocyte Sedimentation Rate(ESR)
8. Measurement of Blood Pressure (BP)
9. Pulmonary function test by Spirometer

Spotters
1. B.P.apparatus
2. Stethoscope.
3. ECG apparatus
4. Types of Muscle cell
5. Pace Maker
6. Nerve Cell
7. Nephron
8. Spirometer

MICROBIOLOGY PRACTICAL
1. Identification of microorganisms from the habitats [simple staining, differential staining.]
2. Morphological Observation of bacterial cell.
4. Motility study of Lactobacillus – Hanging drop method

Spotters:-
Mycoplasmas, Rickettsiae, Chlamydiae, Staphylococcus aureus, Streptococcus pneumoniae, Salmonella, HIV, Hepatitis virus and Rabies virus.
Fermentor, Bioreactors, Biofilters

DEVELOPMENTAL BIOLOGY PRACTICAL
1. Blastoderm mounting in Chick (demonstration only)
2. Study of the following prepared slides / models
3. Section of testis and Ovary [ Mammalian]
4. Slides of Mammalian sperm and ovum.
6. Study of cleavage stages 2 Cell, 4Cell, 8Cell
8. Slides of different stages of chick embryo – 18 hours [primitive streak stage], 24 hours, 48 hours 72 hours and 96 hours.
CORE 8: (SUPPORTIVE 2) BOTANY II - THEORY

(Cytology, Anatomy, Physiology, Microbiology and Plant Ecology)

Unit I: Cell and Organelles (10 Lectures)
Study of plant cell organelles with emphasis on cell wall, Chloroplast, Mitochondria and Nucleus.

Unit II: Plant Anatomy (12 Lectures)
Anatomy of primary and secondary structure of dicot- stem and root; primary structure of stem and root in monocot, anatomy of dicot and monocot leaf.

Unit III: Plant Physiology (12 Lectures)
Brief study of mechanism of ion uptake and transport, photosynthesis (photochemical reactions, carbon assimilation reactions- C_3 and C_4 cycles), nitrogen fixation by symbiotic bacteria and phytohormones (auxins and cytokinins).

Unit IV: Microbiology (14 Lectures)
Survey of useful microbes: Agricultural uses of microbes: biodegradation and biodeterioration. Soil microflora - biofertilizers. Industrial uses of microbes (fermentation, alcoholic beverages); Food microbiology (microbial spoilage of food, microbial contamination of milk and water).

Unit V: Plant Ecology (12 Lectures)
Plant Ecology: Brief study of ecosystems, plants as primary producers, food chain and food web, ecological pyramids. Forests their importance and conservation, urban and rural forestry. Plants as pollution indicators.

Suggested Readings
BOTANY - II- PRACTICAL

(Cytology, Anatomy, Physiology, Microbiology and Plant Ecology)

4. Study of Cell Organelles include in Unit I from electron micrographs.
5. Anatomical studies of plant parts included in Unit II.
6. To perform simple experiments as included in Unit III.
7. Study of microbes as included in Unit IV.
8. Study of ecological processes included in Unit V.
CORE 9: VECTOR BIOLOGY

Objectives:
To understand insect vectors of economic importance To study vector born diseases and their control

Unit-1
Introduction - Scope of vector biology; Classification of insects vectors; - Morphological features of Insect vectors, Mouth parts, feeding habits; Types of Vectors (mechanical and biological ), Adaptations of vectors, Reservoirs, Host Specificity

Unit-2
Dipteran insect vectors – Mosquitoes, Sand fly, Houseflies; transmission cycles, Study of Dipteran-borne diseases – Malaria, Dengue, Filariasis; Leishmaniasis, Phlebotomus fever; cholera and dysentery

Unit-3
Siphonapteran insect vectors – Flea, transmission cycles; Study of Flea-borne diseases – Plague, Endemic Typhus.
Siphunculatan insect vectors-Human louse, transmission cycles; Study of louse-borne diseases – Relapsing fever, Trench fever.

Unit-4
Hempiteran insect vectors – Bugs, transmission cycles; Bug-borne diseases; Chagas disease, Q fever.

Unit - 5
Control of vector and vector borne diseases; Vector control- Chemical, Biological, Genetic and Environmental. Insecticide resistance in vectors. Drug resistance in pathogens. Importance of education, awareness and Community participation.

Suggested Readings
CORE 10: IMMUNOLOGY

Objectives: To study the process which help to maintain the organisms internal environment, when challenged with foreign substances.
To understand the advances in Immunology

Unit: I
Introduction-Scope of immunology- Historical perspectives - Immunohaematology- blood groups, blood transfusion, Rh-incompatibilities; Types of immunity- innate and acquired immunity.

Unit: II
Anatomy of lympho-reticular system- primary and secondary lymphoid organs; Cells of the immune system, T and B cells receptors-activation and function.

Unit: III
Antigens- Types, properties, antigenic determinants, haptens, adjuvants. Immunoglobins-types, structure and properties, Monoclonal and polyclonal antibodies; Antigen-antibody interactions. Vaccines- types, toxoids, antitoxins.

Unit: IV
Immune responses- Primary and secondary immune response- Cell mediated and humoral immune responses, Immune responses against tumors, Immunologic tolerance and disorders, autoimmune diseases.

Unit: V
Complement system- Classical and alternate pathway, MHC-classes, haplotype, MHC and peptide interactions. Hypersensitivity reactions – types and diseases. Types of grafts, graft Vs host reactions.

Suggested Readings
CORE 11: ORNAMENTAL FISH CULTURE AND AQUARIUM TECHNOLOGY

Objective:
To impart training on Aquarium fish keeping technology
To create knowledge on self employment opportunity

UNIT - I
Importance and scope of ornamental fish culture – Economic potential, commercial and aesthetic value of ornamental fish culture, trends in ornamental fish farming in the world and in India. Taxonomy of important freshwater and marine ornamental fish of indigenous and exotic species.

UNIT – II

UNIT – III

UNIT –IV
Disease management: Common bacterial, viral, fungal, protozoan and crustacean infections - treatment and control.

UNIT –V

Suggested Readings.
CORE 12: (SUPPORTIVE 3) CHEMISTRY-I

Unit 1
Intermolecular forces - Vanderwall and London forces. Liquid state theory and properties of liquids, liquid-crystal formation and applications. Solid state- forces in solids- covalent, ionic, metallic, and Vanderwall’s, Lattice energy.

Unit 2

Unit 3
Covalent bond- Orbital Overlap- hybridization, geometry of organic molecules- methane, ethylene, acetylene, benzene. Electron displacement effects, inductive, resonance, hyperconjugative and steric effects-their effect on properties of compounds. Stereoisomerism- Optical isomerism-optical activity, lactic acid, tartaric acid, racemization, resolution.

Unit 4:
Aromatic compounds-electrophilic substitution in benzene, mechanism of nitration, halogenation, Alkylation and Acylation. Preparation, properties and uses of Naphthalene, Furan, Thiophene, Pyrrole, Pyridine, Chloroform and Carbon Tetrachloride.

Unit 5:

Text books:

CHEMISTRY LAB I

1. Estimation of sodium hydroxide using sodium carbonate standard.
2. Estimation of hydrochloric acid using oxalic acid standard.
5. Estimation of oxalic acid using ferrous sulphate standard.
6. Preparation of the following inorganic compounds: ferrous ammonium sulphate, manganous sulphate, sodium thiosulphate
CORE 13: CELL AND MOLECULAR BIOLOGY

Objectives:
To learn the structure and functions of various cellular components.
To understand the molecular basis of cell structure DNA structure and functions.

Unit – I
History of cell biology – Cell theory – Cell as the basic unit of living organism,
Difference between Prokaryotic and Eukaryotic cell, Ultra structure of an Animal Cell, Plasma membrane – Ultra structure, chemical composition, models ( Bilayer, Unit membrane, fluid mosaic) and functions.

Unit-II

Unit – III

Unit – IV
Nucleic acids – Molecular structure of DNA and RNA , DNA replication, Transcription, Types of RNA, Protein Synthesis (Eukaryotic) , Regulation of Protein Synthesis.

Unit – V
Gene Mutation, Molecular basis of Gene Mutation (Sickle cell anemia, phenylketonuria) – Mutagenic agents - Physical and chemical. DNA Repair , DNA Recombination DNA barcoding- role of mitochondrial DNA in barcoding;

Suggested Readings:
CORE 14: BIOCHEMISTRY AND INTERMEDIARY METABOLISM

Objectives:
To define and explain the basic principles of biochemistry and metabolic pathway

UNIT I
Scope of Biochemistry – Dissociation constant of water, Hydrogen ion concentration, Buffers and electrolytes. Acidity, alkalinity and pH determination.

UNIT-II

UNIT-III

UNIT-IV
Intermediary metabolism -Glycolysis -TCA Cycle- Electron transport chain, Deamination, of aminoacids, B- Oxidation of fatty acids. HMP shunt pathway

UNIT – V

Suggested Readings
VECTOR BIOLOGY PRACTICAL
1. Study of different kinds of mouth parts of insects
2. Study of following insect vectors through permanent slides/photographs:
   Aedes, Culex, Anopheles, Pediculus humanus capitis, Pediculus humanus corporis, Phthirus pubis, Xenopsylla cheopis, Cimex lectularius, Phlebotomus argentipes, Musca domestica, through permanent slides/photographs
3. Study of different diseases transmitted by above insect vectors

IMMUNOLOGY PRACTICAL
1. Human Blood grouping [ABO and Rh]
2. Study of prepared slides of primary and secondary lymphoid organs. Thymus, Spleen, Bone marrow, Lymph node. Peyers patches Bursa fabricus T – cell, B-cell MALT GALT

ORNAMENTAL FISH CULTURE AND AQUARIUM TECHNOLOGY PRACTICAL
1. Identification of Common freshwater aquarium fishes
2. Identification of Common marine ornamental fishes
3. Identification of plants and décor materials for aquarium
4. Identification, symptoms and treatment of diseases of aquarium fishes
5. Field visit: Visit to ornamental/aqua farms (Tour report submission)
ZOOLOGY LABORATORY-IV

CELL AND MOLECULAR BIOLOGY PRACTICAL

1. Onion root tip – squash preparation and study of mitosis
2. Chironomous larva - squash preparation of giant chromosome.
3. Squash preparation of squamous epithelial cells from buccal smear
4. Measurement of cell dimensions by using stage and ocular micrometer
5. Total count of RBC and WBC using Haemocytometer.
7. Study of prepared slides of histology. Columnar Epithelium, Ciliated epithelium, Glandular Epithelium, Cartilage T.S., Bone T.S.
8. Isolation and Estimation of DNA and RNA (Demonstration only)
9. Protein separation by Gel electrophoresis (PAGE) (Demonstration only)

BIOCHEMISTRY AND INTERMEDIARY METABOLISM PRACTICAL

1. Qualitative analysis of sugar
2. Qualitative analysis of Glycogen
3. Qualitative analysis of Protein
4. Quantitative analysis of glucose
5. Quantitative analysis of protein
6. Separation of Aminoacid by Paper Chromatography
7. Enzyme Assay – Urease
8. pH meter
9. Models of biomolecules
CORE 16: (SUPPORTIVE 4) CHEMISTRY-II

Unit 1:
Co-ordination chemistry – definition of terms, classification of ligands, nomenclature. Chelation – examples, chelate effect explanation. Werner’s theory- conductivity and precipitation studies. Sedgwick’s theory- Effective atomic number concept. Pauling’s theory- postulates, applications to octahedral, square, planar and tetrahedral complexes.

Unit 2:

Unit 3:

Unit 4:

Unit 5:

Text books:
CHEMISTRY LAB II

1. Detection of elements – nitrogen, sulphur and halogens.
2. Preliminary test and detection of carbohydrate, urea, benzamide and aromatic amines.
4. Reaction of aldehyde (aromatic), ketone (aliphatic and aromatic), carbohydrate, carboxylic acid (mono-and dicarboxylic-), phenol, aromatic primary amine, amide and diamide.
5. Systematic analysis of organic compounds containing one functional group and characterization by confirmatory tests or derivatives.
CORE 17: BIOINSTRUMENTATION

Objectives:
To acquire the knowledge of basic principles and applications of tools. To know the techniques for the measurement of physical, physiological, biochemical and biological factors in man and other living organism.

UNIT – I
Microscope - Principles and types of light Microscope, Phase Contrast Microscope, X-ray Microscope, Fluorescence Microscope, Confocal microscope, Type of Electron Microscope (SEM and TEM)

UNIT – II
Centrifuge - Types of Centrifuge – Clinical, Refrigerated and High Speed centrifuges. pH meter and its application, Colorimeter, Spectrophotometer - Principle, Structure and Uses.

UNIT – III

UNIT – IV
Blotting techniques – Southern, Northern and Western DNA and RNA sequencing method (First, second and third generation), PCR and gene amplifier.

UNIT – V
Geiger Muller Counter, Biochemical application of radioisotopes, Radio isotopic technique – Radio Immuno assay, Autoradiography

Suggested Readings
CORE 18: ENDOCRINOLOGY AND REPRODUCTIVE BIOLOGY

Objectives: Explaining the role of hormones on physiological activities of animals with special reference to humans.

UNIT – I
Scope of Endocrinology, Endocrine glands, hormones and hormone action, Structure, hormone secretion and functions of hypothalamus and pituitary gland. Pineal gland – circadian rhythm.

UNIT – II
Structure of thyroid gland – Biosynthesis of thyroid hormones, Biological functions of Thyroid hormones, Regulation of Thyroid secretion. Hormones of parathyroid Glands and their biological action.

UNIT – III
Adrenal Cortex – Glucocorticoids, Mineralocorticoids and their biological function. Renin Angiotensin System
Adrenal Medulla – Catecholamines – Synthesis and Biological action.

UNIT – IV
Pancreatic (Islets of Langerhans) hormones – Insulin, Glucagon – Biosynthesis, Regulation, Biological action. Gastrointestinal Hormones.

UNIT – V
Male reproductive system: Structure of Testes, Biosynthesis of testosterone, Regulation and functions.

Suggested Readings
CORE 19: POULTRY AND DAIRY SCIENCE

Objectives:
To impart training on Modern Poultry and Dairy Science Technology To create knowledge on self employment opportunity.

UNIT – I
External morphology of a fowl, Classification of fowls based on their Use.
Nutritive value of meat and egg, Meat type – Broilers, Egg type- White Leghorn, Dual purpose Varieties, Game and Ornamental purpose Varieties

UNIT-II
Management of Broilers and Egg Layers – Housing and Equipment, Brooding, feeding and health care Poultry diseases- prevention and control ( any five), Vaccination

UNIT-III
Dairy breeds of India : Cattle and Buffaloes, Native and Exotic Breeds
Nutritive value of Milk and meat , Milk synthesis and Secretion, Composition of Milk. Artificial Insemination Programme, Merits and Demerits of Inbreeding and Outbreeding

UNIT-IV
Farm Management : Housing and Equipments of dairy forms- Feed, Care and Management of adult and newborn calves, Live Stock diseases and Management

UNIT-V
Storage and Marketing of Poultry and Dairy Products, Role of Govt. and Co operative Societies in Production and Marketing. Progressive plans to promote Poultry and Dairy technology as a Self employment Venture.

Suggested Readings
CORE 20: EVOLUTION AND CONSERVATION BIOLOGY

Objectives:
To explain the scientific concepts of animal evolution through theories and evidences.

Unit –I

Unit –II
Theories of Evolution : Lamarckism, Neo-lamarckism, Darwinism, Neo-Darwinism, Devries concept of Mutation, Modern version of Mutation theory.

Unit –III
Origin of Species, Phylogentic and biological concept of species: Mechanisms of reproductive isolation; Models of speciation

Hardy –Weinberg law of genetic equilibrium. natural selection, mutation, genetic drift and migration.

Unit –IV

Unit – V
Threats to biodiversity: Habitat loss; invasive species, Overexploitation, Climatic changes. Anthropogenic activities: Pollution. Biodiversity management : Ex-situ and In-situ conservation. Protected areas- Wild life wealth of India, Hot spots, Restoration of damaged ecosystem and endangered population

Suggested Readings
CORE 21: GENETICS AND BIOTECHNOLOGY

Objectives:
To know the principles of genetics and to integrate biology with technology.

UNIT – I
Introduction to genetics, Basis of Mendelian Inheritance and Mendelian Laws, Interaction of Genes – Multiple Alleles – Blood Groups and their Inheritance in Human.

UNIT – II

UNIT – III

UNIT – IV

UNIT – V
Techniques of Genetic Engineering – an overview of R DNA technology, application of R DNA technology in agriculture, medicine and environment.

Suggested Readings
1) Verma P.S. and Agarwal V.K. – Concepts of Genetics
2) Rastogi V.B. A text book of Genetics, Kadarnath, Ramnath, Meerat.
CORE 22: ZOOLOGY LABORATORY

ZOOCOLOGY LABORATORY-V

BIOINSTRUMENTATION PRACTICAL

Experiment/Spotter

1. Determination of pH by pH meter
2. Principle and Operation of Centrifuge
3. Principle and Operation of Colorimeter
4. Principle and Operation of Spectrophotometer
5. Principle and Operation of Electrophoresis

ENDOCRINOLOGY AND REPRODUCTIVE BIOLOGY PRACTICAL

1. Observation of permanent slides – Pancrease, Testes, Ovary, Adrenal Pituitary
2. Test for Pregnancy
3. Fertility test
ZOOLOGY LABORATORY -VI

POULTRY AND DAIRY SCIENCE PRACTICAL
1. Identification of feathers
2. Incubation of Eggs: Temperature and humidity control.
3. Identification of eggs
4. Biochemical estimation of nutritive contents in a hen’s egg (demonstration)
5. Visit to poultry markets and study of specific marketing problems.
6. Testing freshness of Egg
7. Screening of fertilization

Spotters/Chart
1. Identification of different varieties of poultry and dairy
2. Equipments

EVOLUTION AND CONSERVATION BIOLOGY PRACTICAL
1. Study of Fossils
2. Field Visit to wild life sanctuaries and National parks( Tour report submission)
3. Homologous organs
4. Analogous organs
5. Industrial melanism
6. Adaptive radiation (Darwin finches)
7. Living fossils
8. Connecting link
9. Hardy Weinberg law calculation

GENETICS AND BIOTECHNOLOGY PRACTICAL

GENETICS
1. Observation of wild and Mutant forms of Drosophila.
3. Study on Normal Karyotype - male and female,

BIOTECHNOLOGY
5. Study of prepared slides, Models or specimen. Escherichia coli, Bacteriophage Plasmid
PART III

COMPUTER SCIENCE
### B.Sc., B.Ed. LIBERAL OPTIONS

**PART III: B.SC.B.ED.**

**Branch: COMPUTER SCIENCE**

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*note: Stream for Supportive Papers should be chosen in the first semester, same stream should be chosen in the successive semesters*

- **Stream A:** Science related papers (Physics I, II)
- **Stream B:** Mathematics related paper (Operations Research, Discrete Mathematics)
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CORE 1: INTRODUCTION TO PROBLEM SOLVING USING C

Prerequisite: - Basic knowledge of Mathematics and Computers

Objective
• To learn the concepts of “ C ” Programming
• To learn how to use develop software programs for day-to-day applications.

MODULE – I

MODULE- II

MODULE – III
C Functions - Program Modules in C - Math Library Functions – Functions- Function Definitions -Function Prototypes: A Deeper Look - Function Call Stack and Stack Frames- Passing Arguments By Value and By Reference - Recursion vs. Iteration - C Arrays - Defining Arrays - Passing Arrays to Functions- Sorting Arrays- Searching Arrays - Multidimensional Arrays

MODULE – IV
Structure & Union - C Pointers- Pointer Variable Definitions and Initialization- Pointer Operators- Passing Arguments to Functions by Reference - sizeof Operator - Pointer Expressions and Pointer Arithmetic- Relationship between Pointers and Arrays - Pointers to Functions - C Characters and Strings – Character - Handling Library- String-Conversion Functions - Standard Input/Output Library Functions- String-Manipulation Functions -C Formatted Input/Output

MODULE –V
C File Processing - Files and Streams- Creating a Sequential-Access File- Reading Data from a Sequential-Access File - Random-Access Files - Creating a Random-Access File- Writing Data Randomly to a Random-Access File- Reading Data from a Random-Access File- C Preprocessor

Text Books:
CORE 2: DIGITAL ELECTRONICS & COMPUTER ORGANIZATION

Prerequisite: Basic knowledge about computers

Objectives:

- To learn the fundamentals of digital system design.
- To learn combinational and sequential logic.
- To learn hardware fundamentals of computer design.

MODULE – I
Number systems & Conversions – Arithmetic of number systems – binary codes –
BCD – The excess – 3code – Gray code – ASCII – EBCDIC - Introduction to Logic
Circuits – logic functions & gates – Inversion – truth tables – logic gates – truth table
of basics gates – timing diagrams of NOT, AND & OR gates – Boolean algebra –
NAND & NOR logic gates - truth table of a logic circuit – de-morgan’s theorem

MODULE – II
Logic families – factors affecting performance of a logic family – register transistor
logic – diode transistor logic – DCTL – ECL – TTL logic family – Karnaugh maps –
two, three & four-variables K-map – loops in K-map – mapping of K-maps – don’t
care condition

MODULE – III
Sequential logic circuits – sequential circuits – SR flip flop – D flip flop – JK flip
flop – T flip flop – flip flop triggering – Shift registers – data movements in digital
systems – classification of counters – Combinatorial logic circuits – designing
procedure– code converters – multiplexers – multiplexer tree – demultiplexers
/decoders – half & full adder – half & full subtractor – encoders – BCD adder

MODULE – IV
Basic Structure of Computers - Computer Types, Functional Modules, Basic
operational Concepts, Bus Structures, Software, Performance, Multiprocessors and
Multi-computers, Historical perspective - Input/Output Organization - Accessing I/O
devices, Interrupts, Processor examples, Direct memory access, Buses, Interface
circuits, Standard I/O interfaces.

MODULE – V
Memory System - Basic concepts, Semi-conductor RAM memories, Read-
only memories, Speed, Size and Cost, Cache memories, Performance considerations,
Virtual Memories, memory management requirements, Secondary Storage.

Text Books:
   2014.
   publishing. New Delhi, 2013.
CORE 3: COMPUTER LAB

Lab-I: PROGRAMMING IN C LAB

LIST OF EXERCISES
1. Simple C programs
2. Program to illustrate control statements
3. Program to illustrate FOR loop
4. Program to illustrate SWITCH & WHILE statements
5. Program to illustrate functions
6. Program to illustrate user-defined functions
7. Program to illustrate arrays
8. Program to illustrate usage of pointers
9. Program to illustrate character handling libraries.
10. Program to illustrate string manipulation
11. Program to illustrate creation of files & streams.
12. Program to illustrate creation, reading & accessing sequential & random files
Lab-II: DIGITAL LAB

LIST OF EXERCISES

1. Study of Logic Gates
2. Design of Adder and Subtractor
3. Design and Implementation of Code Convertors
4. Design of 4-Bit Adder And Subtractor
5. Design and Implementation of Magnitude Comparator
6. 16 Bit Odd/Even Parity Checker and Generator
7. Design and Implementation of Multiplexer and Demultiplexer
8. Design and Implementation of Encoder And Decoder
9. Design and Implementation of 3 Bit Synchronous Up/Down Counter
10. Design and Implementation of Shift Register
11. Simulation of Logic Gates
12. Simulation of Adder and Subtractor
13. Design of 4-Bit Adder and Subtractor
CORE 4: (SUPPORTIVE 1) MATHEMATICS I

UNIT-1 (ALGEBRA)
Matrices - Rank of a matrices - Consistency of a system of linear non-homogeneous equations (statement only) - Simple problems - Characteristic roots of a square matrix - Evaluation of Eigen values and Eigen vectors of a square matrix - Cayley Hamilton theorem (Statement only) - Simple problems.

UNIT-2 (TRIGNOMETRY)
De Moivre's theorem - Expansions of \( \cos(n\Theta) \), \( \sin(n\Theta) \) and \( \tan(n\Theta) \) - Powers of sines and cosines of \( \Theta \) in terms of functions of multiples of \( \Theta \). Expansions of \( \sin(\Theta) \), \( \cos(\Theta) \) in a series of ascending powers of \( \Theta \)- Limits and approximations.

UNIT-3 (FUNCTIONS OF COMPLEX VARIABLE)
Analytic functions - Cauchy Riemann equations - derivation and simple problems - Harmonic functions

UNIT-4 (VECTOR CALCULUS)
Vector differentiations - Scalar point functions - Vector point functions - Derivatives of a Vector point functions, sum of two vector point functions, product of scalar and Vector point function, Vector product - The vector operator Del, Gradient, Divergence and Curl - Simple application problems involving Cartesians - Laplace Operator.

UNIT - 5 (POLAR CO-ORDINATES)
Angle between radius and vector and tangent - Angle of intersection of two curves - Pedal equations of a curve

Text books:
1. S. Narayanan and T.K. Manicavachagom pillai, Calculus, S. Viswanathan Publishers
4. P. DuraiPandian, Vector Calculus, 1984

Reference Books:
CORE 5: PYTHON PROGRAMMING

Prerequisite: Knowledge of any programming language

Objectives:

• To learn about the fundamentals of computers
• To learn how to install Python, start the Python shell
• To learn to perform basic calculations, print text on the screen and create lists, and perform simple control flow operations using if statements and for loops
• To learn how to reuse code with functions

MODULE – I
Computer Systems - Python Programming Language Computational Thinking - Python Data Types - Expressions, Variables, and Assignments – Strings – Lists – Objects & Classes – Python standard library

MODULE – II
Imperative programming – Python modules – print() function – functional eval() - Execution Control Structures – user-defined functions python variables & assignments parameter passing

MODULE – III
Text Data, Files & Exceptions – Strings revisited – formatted output – files – errors & exceptions - Execution Control Structures – decision control & the IF statement

MODULE – IV
Container and Randomness – Dictionaries – other built-in container types – character encodings & strings – module random

MODULE – V
FOR loop & Iteration Patterns – two-dimensional lists- while loop – more loop patterns – additional iteration control statements- namespaces – encapsulation in functions – global vs local namespaces exceptional flow control – modules as namespaces

Text Books:
CORE 6: DATA STRUCTURES AND ALGORITHMS

Prerequisite: Knowledge of any programming language Objectives:

- To acquaint students with data structures used when programming for the storage and manipulation of data.
- The concept of data abstraction and the problem of building implementations of abstract data types are emphasized.
- Data Structure Algorithms for stack, queues, linked list, trees, graphs, sorting and searching.

MODULE-I
Definition of a Data structure - primitive and composite Data Types, Arrays, Operations on Arrays, Ordered lists - Stacks - Operations - Applications of Stack - Infix to Postfix Conversion.

MODULE-II

MODULE-III
Trees: Binary Trees - Operations - Graph - Definition, Types of Graphs, Graph Traversal - DFS and BFS.

MODULE-IV

MODULE - V
Role of algorithms in computing - Sorting and Searching Techniques - Elementary sorting techniques –Bubble Sort, Insertion Sort, Merge Sort, Quick Sort

Text Books
CORE 7: COMPUTER LAB

Lab III: PYTHON LAB

LIST OF EXERCISES

1. Program to convert the given temperature from Fahrenheit to Celsius and vice versa depending upon user’s choice.
2. Program to calculate total marks, percentage and grade of a student. Marks obtained in each of the three subjects are to be input by the user. Assign grades according to the following criteria:
   - Grade A: Percentage >=80
   - Grade B: Percentage>=70 and <80
   - Grade C: Percentage>=60 and <70
   - Grade D: Percentage>=40 and <60
   - Grade E: Percentage<40
3. Program using user-defined functions to find the area of rectangle, square, circle and triangle by accepting suitable input parameters from user.
4. Program to display the first n terms of Fibonacci series.
5. Program to find factorial of the given number.
6. Program to find sum of the following series for n terms: \[ 1 - \frac{2}{2!} + \frac{3}{3!} - \cdots - \frac{n}{n!} \]
7. Program to calculate the sum and product of two compatible matrices.
8. Program to calculate the mass m in a chemical reaction. The mass m (in gms) disintegrates according to the formula \( m = \frac{60}{(t+2)} \), where t is the time in hours. Sketch a graph for t vs. m, where t>=0.
9. A population of 1000 bacteria is introduced into a nutrient medium. The population p grows as follows:
   \[ P(t) = \frac{15000(1+t)}{15+e} \]
   where the time t is measured in hours. WAP to determine the size of the population at given time t and plot a graph for P vs t for the specified time interval.
10. Input initial velocity and acceleration, and plot the following graphs depicting equations of motion:
    I. velocity wrt time \( v = u + at \)
    II. distance wrt time \( s = ut + 0.5at^2t \)
    III. distance wrt velocity \( s = (v^2 - u^2) / 2a \)
Lab IV: DATA STRUCTURE & ALGORITHM LAB

LIST OF LAB EXERCISES

1. Implementation of stack
2. Implementation of Queue
3. Implementation of Singly Linked List
4. Implementation of Doubly linked list
5. Implementation of Binary tree and traversals (BFS & DFS)
6. Implementation of Insertion sort
7. Implementation of Selection Sort
8. Implementation of Quick sort
9. Implementation of Merge sort
10. Implementation of Infix to Postfix & Infix to Prefix notations.
UNIT - 1 (INTEGRAL CALCULUS)
Evaluation of \( \int e^{ax} \cos (bx) \, dx \) and \( \int e^{ax} \sin (bx) \, dx \), - Bernoulli’s formula for integration by parts – Definite integrals – reduction formulae – Related definite integrals – properties – reduction formula for \( \int e^{ax} x^n \, dx \), \( \int \sin^n x \, dx \) and \( \int \cos^n x \, dx (n \text{ is a positive integer}) \) - Evaluation of \( \int e^{x^2} \, dx \), \( \int \sin^n x \, dx \), \( \int \cos^n x \, dx \), - Rule of writing down \( \int \sin^n x \cos^n x \, dx \) and illustrations

UNIT - 2 (VECTOR INTEGRATION)
Gauss Divergence theorem and Stokes’s theorem (Statement only) – Simple problems

UNIT-3 (FOURIER SERIES)
Definition – Finding Fourier co-efficient for a given period function with period \( 2\pi \) - Odd and Even functions – Half range series

UNIT-4 (ORDINAR DIFFERENTIAL EQUATIONS)
Equations of the first order but not of the first degree – Equations solvable for \( dy/dx \), - equations solvable for \( y \) - Equations Solvable for \( x \) - Clairaut’s form (simple cases) – Linear equations with constant coefficients – Evaluation of the particular integral of the equation – \( e^x \), \( \sin(ax) \), \( \cos(ax) \), \( x^k \), \( e^{ax} f(x) \)

UNIT – 5 (LAPLACE TRANSFORM)
Definitions – Condition for the existence of Laplace transform – Laplace transform of \( 1 \), \( e^{at} \), \( e^{-at} \), \( \cos(at) \), \( \sin(at) \), \( \sinh(at) \), \( \cosh(at) \) and \( t^n \) - Simple problems – Laplace transform of the derivatives – Laplace transform of the integral – first shifting theorem – change of scale of property – Laplace transform of function multiplied by \( t \), divisible by \( t \) – inverse Laplace transform – solution of ordinary differential equations using Laplace transforms

Text books:
1. S. Narayanan and T.K. Manicavachagom pillai, Calculus, S. Viswanathan Publishers
2. P. DuraiPandian, Vector Calculus, 1984

Reference Books:

Comp_12
CORE 9: SOFTWARE ENGINEERING

Prerequisite: Basic knowledge of programming

Objectives:

- Identify, formulate, and solve software engineering problems, including the specification, design, implementation, and testing of software systems that meet specification, performance, maintenance and quality requirements
- Elicit, analyze and specify software requirements through a productive working relationship with various stakeholders of a software project.
- Need to function effectively as a team member
- Understanding professional, ethical and social responsibility of a software engineer
- Participate in design, development, deployment and maintenance of a medium scale software development project.

MODULE – I

MODULE – II

MODULE – III
Software Project Planning – size estimation – cost estimation – models – Constructive cost model – software risk management – software design – what is design – modularity – strategy of design – function oriented design - object oriented design

MODULE – IV

MODULE – V
Software testing – strategic approach to software testing – terminologies – functional testing – structural testing – levels of testing – validation testing – the art of debugging – testing tools

Text Book:
CORE 10: OPERATING SYSTEMS

**Prerequisite:** Knowledge of computers & computer organization

**Objectives:**
- To learn Structure and functions of OS
- To learn Processes and Threads, Scheduling algorithms
- To learn Principles of concurrency and Memory management
- To learn I/O management and File systems

**MODULE - I**

**MODULE - II**

**MODULE - III**

**MODULE - IV**

**MODULE - V**

**Text Books:**
CORE 11: DATABASE MANAGEMENT SYSTEM

Prerequisite: Knowledge of data structures and file-handling Objectives:

- To learn about the basics of database management systems (DBMS), with an emphasis on how to organize, maintain and retrieve efficiently, and effectively the information from a DBMS.
- To learn the fundamental concepts of the relational model, including relations, attributes, domains, keys, foreign keys, entity integrity and referential integrity.
- To learn how to normalize the data using 1st, 2nd & 3rd normal forms
- To define and manipulate the relational databases in SQL.

MODULE - I

MODULE - II
Entity-Relationship Model - Introduction, the building blocks of an entity relationship diagram, classification of entity sets, attribute classification, relationship degree, relationship classification, reducing ER diagram to tables, enhanced entity-relationship model (EER model), generalization and specialization, ISA relationship and attribute inheritance, multiple inheritance, constraints on specialization and generalization, aggregation and composition - advantages of ER modeling.

MODULE - III

MODULE - IV
Structured Query Language - Introduction, History of SQL Standard, Commands in SQL, Data Types in SQL, Data Definition Language, Data Manipulation Language, Data Control Language - Table Modification Commands – primary & foreign keys

MODULE - V
PL/SQL: Introduction, Shortcoming in SQL, Structure of PL/SQL, PL/SQL Language Elements, Data Types, Operators Precedence, Control Structure, steps to Create a PL/SQL, steps to create a Cursors, Procedure, Function, Packages, Exceptions Handling, Database Triggers, Types of Triggers.

Text Books
CORE 12: (SUPPORTIVE 3) PHYSICS I

UNIT-I: Moment of inertia – radius of gyration - parallel and perpendicular axis theorem, calculation of moment of inertia of (a) ring (b) disc (c) hollow and solid spheres. Angular momentum, torque and the relation between them. Simple harmonic motion, equation of SHM, composition of two SHM at right angles, Lissajous figures.

UNIT-II: Young’s modulus — bulk modulus — rigidity modulus and Poisson’s ratio — derivation of the expression for bending moment of a beam in terms of it curvature of neutral axis – determination of Young’s modulus of a rectangular bar — non – uniform bending — pin and microscope method-with theory (mathematical derivation) – expression for couple per unit twist-determination of rigidity modulus – torsion pendulum.


UNIT -IV: Newton’s law of cooling – determination of specific heat of liquid-Barton’s cooling correction in calorimetric experiments – specific heat capacity of gases – ratio of specific heat capacities


TEXTBOOKS:
1. Dr.Sabesan and others,ATextbook of Allied Physics Vol-Iand Vol-II
2. Ponnusamy and others, AncillaryPhysics.

REFERENCE BOOKS
Choose any 7 experiments from the list given below for each semester without overlap.

**LIST OF EXPERIMENTS:**

1. Young’s modulus-Non-Uniform bending-Pin & Microscope
2. Rigidity modulus-Torsional oscillations without masses.
3. Comparison of coefficient of viscosity.
4. Surface tension of a liquid and interfacial surface tension by drop weight method.
5. Spectrometer – Refractive index of a liquid- Hollow prism.
7. Spectrometer -Grating-wavelength determination by minimum deviation method.
9. Thermal conductivity of a bad conductor - Lee’s disc method
11. Melde’s apparatus-Determination of frequency.
12. Meter Bridge - Temperature coefficient of the material of a coil of wire
13. Potentiometer – calibration of low range voltmeter (0 - 1.5 V).
14. Potentiometer - calibration of ammeter (0-1.5 amps).
15. Figure of merit of a periodic moving coil galvanometer.
16. Field along the axis of the circular coil carrying current- Determination of BH.
17. Newton’s law of cooling and specific heat determination
18. Frequency measurement by forming Lissajous figures
20. Transistor characteristics-CE mode- only transfer characteristics.

**TEXTBOOKS:**

1. Ouseph and V. Srinivasan, Practical Physics- Part-I & II.

**REFERENCE BOOKS**

1. Mathchan Lazarus and others-Practical Physics
CORE 12: (SUPPORTIVE 3) - OPERATIONS RESEARCH

1. Linear programming problem Graphical method - Simplex method.
2. Transportation problem.
4. Replacement problem Replacement of items that deteriorate with time and Replacement of items that fail completely.
5. Network analysis Basic concepts Construction of network diagram CPM and PERT.

Text book:
Unit 1: Chapter 2 Sections 2.1 to 2.3 and Chapter 3 Sections 3.1 to 3.3 Chapter 4 Sections 4.1, 4.3,4.4
Unit 2: Chapter 10 Sections 10.1 to 10.12
Unit 3: Chapter 11 Sections 11.1 to 11.3 and 11.6
Unit 4: Chapter 18 Sections 18.1 to 18.3
Unit 5: Chapter 21 Sections 21.1 to 21.6
CORE 13: VISUAL PROGRAMMING USING C#

Prerequisite: Knowledge of C language and DBMS

Objectives:
- To understand the various types of applications
- To get expertise in visual programming
- To understand the functionalities of middleware platform

MODULE – I

MODULE – II
Introduction to Classes and Objects – Introduction - Classes, Objects, Methods, Properties and Instance Variables - Declaring a Class with a Method and Instantiating an Object of a Class - Declaring a Method with a Parameter - UML Class Diagram with a Property - Software Engineering with Properties and set and get Accessors - Initializing Objects with Constructors - Floating-Point Numbers and Type decimal - Control Statements

MODULE – III
Classes and Objects: A Deeper Look – Introduction - Controlling Access to Members - Referring to the Current Object’s Members with the this Reference – Indexers - Default and Parameterless Constructors – Composition - Garbage Collection and Destructors- static Class Members - Data Abstraction and Encapsulation - Object Initializers – Delegates Object-Oriented Programming: Inheritance - Polymorphism, Interfaces and Operator Overloading-Exception Handling

MODULE – IV

MODULE – V
Databases and LINQ - Introduction - relational Databases - LINQ to SQL - Querying a Database with LINQ - Dynamically Binding Query Results - Retrieving Data from Multiple Tables with LINQ - Creating a Master/Detail View Application - Tools and Web Resources Case Study

Text Book:
CORE 14: COMPUTER NETWORKS

**Prerequisite:** Basic knowledge of computers

**Objectives:**

- Given an environment, after analyzing the channel characteristics, appropriate channel access mechanism and data link protocols are chosen to design a network.
- Given an environment, analyzing the network structure and limitations, appropriate routing protocol is chosen to obtain better throughput.
- Given various load characteristics and network traffic conditions, decide the transport protocols and timers to be used.

**MODULE - I**
Introduction to Networks – Topology - Network Architecture - Reference Models - Example Networks – Transmission Medias

**MODULE - II**

**MODULE - III**

**MODULE - IV**
Application layer - Domain Naming System - DNS Namespace, Resource Records, Name Servers - Electronic mail - Architecture and Services, The User Agent, Messages Formats, Message Transfer

**MODULE - V**

**Text Books:**
CORE 15: COMPUTER LAB

Lab -V: VISUAL PROGRAMMING & DBMS LAB

LIST OF EXERCISES

DBMS

For any TWO online application such as library information system, students; information system, employee information systems, payroll system, ticket reservation system etc., do the followings:

1. Create database and establish relationships between tables
2. Draw ER diagrams
3. Create view to extract details from two or more tables
4. Create stored procedures
5. Create functions
6. Create cursors & database triggers.
7. Create PL/SQLs.

C#

1. Implement Classes and Objects, Inheritance & Polymorphism
2. Implement Interfaces, Operator Overloading, Delegates and Events
3. Implement Exception Handling & Multi-Threading
4. Create Console application & Window Applications.
5. Create programs using SDI & MDI
6. Create program using Database Controls
7. Develop any TWO case studies listed below:
   I. Inventory Control
   II. Retail Shop Management
   III. Employee Information System
   IV. Personal Assistant Program
   V. Students’ Information System
Lab-VI: NETWORKS LAB

LIST OF EXERCISES

1. Implementation of Error Detection / Error Correction Techniques
2. Implementation of Stop and Wait Protocol and sliding window
3. Implementation and study of Go back-N and selective repeat protocols
4. Implementation of High Level Data Link Control
5. Study of Socket Programming and Client – Server model
6. Write a socket Program for Echo/Ping/Talk commands.
7. To create scenario and study the performance of network with CSMA / CA Protocol and compare with CSMA/CD protocols.
8. Network Topology - Star, Bus, Ring
9. Implementation of distance vector routing algorithm
10. Implementation of Link state routing algorithm
11. Encryption and decryption.
CORE 16: (SUPPORTIVE 4) PHYSICS II


UNIT-II: Gauss’s law with proof – Electric intensity and potential due to a uniformly charged hollow conductor at a point outside, on the surface and inside a spherical conductor — capacity of a parallel plate condenser with and without a dielectric slab - capacity of a spherical conductor-Biot & Savart’s law — field along the axis of a circular coil carrying current – force on current carrying conductor placed in a magnetic field – theory of moving coil galvanometer.

UNIT-III: Magnetic properties of materials – relation between – the three magnetic vectors


UNIT-V: Rectifiers & filters (qualitative ideas) – Transistor characteristics – transistor as a RC coupled amplifier – frequency response (without derivation) – band width – basic principles of an oscillator-Hartley oscillator – working (without derivation) – elementary ideas about modulation – elementary ideas about TV transmission and reception.

TEXTBOOKS:
1. Dr.Sabesan and others, A Textbook of Allied Physics-Vol-I and Vol-II.
2. Ponnusamy and others, Ancillary Physics.

REFERENCEBOOKS
PHYSICS II – PRACTICALS

Ref: Physics Practical I
CORE 16: (SUPPORTIVE 4) DISCRETE MATHEMATICS

UNIT I: Mathematical Logic:
Connectives Well formed formulas Tautology Equivalence of formulas Duality law
Tautological implications Normal forms.

UNIT II: Algebraic Structures:
Algebraic systems and their properties Semigroups and monoids Homomorphisms of semi
groups and monoids Subsemigroups and submonoids Grammars and languages, Syntax
analysis Polish expressions and their compilation Finite state machines.

UNIT III: Graph Theory:
Definition Application of graphs Finite and infinite graphs Incidence and degree, Isolated
vertex, pendent vertex and null graph Isomorphism Sub graphs.

UNIT IV: Paths and Circuits:
Walks, paths and circuits Connected graphs, disconnected graphs and components, Euler
graphs Operations on graphs More on Euler graphs - Hamiltonian paths and circuits.

UNIT V: Trees
Trees Some properties of trees Pendent vertices in a tree Distance and centers in a tree
Rooted and binary trees Counting trees - Spanning trees.

TEXT BOOK:
1. J.P.Trembley and R.Manohar, Discrete Mathematical Structures with Applications to
   Chapters 3 and 4 (Sections 3.1, 3.2, 3.3, 3.4 and 4.6) Relevant portions in Chapters
   1.

2. Narasinga Deo: Graph Theory with Applications to Engineering and Computer
Science, Prentice Hall of India Private Limited, New Delhi.
   Relevant portions in Chapters 1, 2 and 3.
CORE 17: OBJECT ORIENTED PROGRAMMING USING JAVA

**Prerequisite:** Basic knowledge of programming

**Objectives:**
- On successful completion of the course the students should have understood the object oriented programming in java
- Should have idea about GUI bases programming
- Should have idea about database programming

**MODULE – I**
Introduction – Introduction to java applications – Introduction to classes, objects, methods & Strings - Control statements - Arrays

**MODULE – II**
Class & Objects – constructor – function overloading & overriding - Inheritance - Polymorphism – Interface – package - exception handling - Introduction to Multithreading

**MODULE – III**

**MODULE – IV**
Files, Streams & Object Serialization – Introduction – Files & Streams – Sequential Access Text Files – Object Sterilization

**MODULE – V**

**Text Books:**
CORE 18: WEB TECHNOLOGY

Prerequisite: Knowledge of operating system, computer network, DBMS, and java language.

Objectives:

- To inculcate knowledge of web technological concepts and functioning of internet
- To learn and program features of web programming languages.
- To understand the major components of internet and associated protocols.
- To design an innovative application for web.

MODULE – I

MODULE - II

MODULE – III

MODULE – IV
Server-Side Programming: Java Servlets - Model-View-Controller Paradigm - Servlet Architecture Overview - Servlets Generating Dynamic Content - Servlet Life Cycle - Parameter Data

MODULE – V
Sessions - Cookies - URL Rewriting - Servlets and Concurrency – database programming using Servlet.

Text Book:
CORE 19: COMPUTER LAB

Lab VII: OBJECT ORIENTED PROGRAMMING USING JAVA

LAB LIST OF EXERCISES

1. Program to illustrate various data types in Java.
2. Program to illustrate class and objects.
3. Program to illustrate control structures (if-then, while, switch).
4. Program to illustrate the concept of arrays (creation, initialization and processing).
5. Program to illustrate Multidimensional arrays.
6. Program to illustrate Constructor and its overloading.
7. Program to illustrate Inheritance and Packages.
8. Program to illustrate Interface and static methods.
9. Program to illustrate modifiers protected, this, final and super.
10. Program to illustrate Exception Handling Technique.
11. Program to illustrate input/output streams.
12. Program to illustrate File handling technique.
13. Program to illustrate threading.
14. Program to illustrate simple Java applets.
15. Program to illustrate database programming.
Lab VIII: WEB TECHNOLOGY LAB

LIST OF EXPERIMENTS

1. Creation of HTML Files
2. Working with Client Side Scripting
   2.1 JavaScript
3. Configuration of web servers
   3.1 Apache Web Server
   3.2 Internet Information Server (IIS)
4. Experiments in Servlet
   5.1 Implementing MVC Architecture using Servlets
   5.2 Data Access Programming (using ADO)
   5.3 Session and Application objects
   5.4 File System Management
5. Write programs in Java to create three-tier applications using servlets
   • for conducting on-line examination.
   • for displaying student mark list. Assume that student information is available in a database which has been stored in a database server.
CORE 20 - OPEN ELECTIVE (Any one)

OPEN ELECTIVE – I : DISTRIBUTED SYSTEM

Prerequisite: Knowledge of operating systems, DBMS and Computer Networks

Objective:
- To make the students to understand the collaborative operations of collections of computer systems.

MODULE I

MODULE II

MODULE III
Remote Invocation – Introduction - Request-reply protocols - Remote procedure call - Remote method invocation - Group communication - Publish-subscribe systems - Message queues - Shared memory approaches -Distributed objects - Case study: CORBA -from objects to components

MODULE IV
Peer-to-peer Systems – Introduction - Napster and its legacy - Peer-to-peer – Middleware - Routing overlays - Overlay case studies: Pastry, Tapestry

MODULE V
- Distributed File Systems –Introduction - File service architecture - Distributed mutual exclusion – Elections

Text Book:
OPEN ELECTIVE II : COMPUTER GRAPHICS

Prerequisite: Knowledge of computers and programming

Objectives:
- Gain knowledge about graphics hardware devices and software used.
- Understand the two dimensional graphics and their transformations.
- Understand the three dimensional graphics and their transformations.
- Be familiar with understand clipping technique

MODULE - I

MODULE - II

MODULE - III

MODULE - IV

MODULE - V

Text Book:
OPEN ELECTIVE – III: ARTIFICIAL INTELLIGENCE

**Prerequisite:** Knowledge of predicate calculus and programming

**Objectives:**
- To study the concepts of Artificial Intelligence and Methods of solving problems using Artificial Intelligence
- To understand the basic techniques of knowledge representation and their use and components of an intelligent agent
- To be able to implement basic decision making algorithms, including search based and problem solving techniques, and first-order logic.
- To know the basic issues in machine learning

**MODULE - I**
Introduction to AI & Production Systems - Introduction - AI problems, foundation of AI and history of AI intelligent agents - Agents and Environments - the concept of rationality, the nature of environments, structure of agents, problem solving agents, problem formulation.

**MODULE - II**

**MODULE - III**
Representation of Knowledge - Knowledge Representation & Reasons logical Agents, Knowledge – based Agents, the Wumpus world, logic, propositional logic, Resolution patterns in propositional logic, Resolution, Forward & Backward Chaining

**MODULE - IV**
First order logic - Inference in first order logic, propositional vs. first order inference, unification & lifts forward chaining, Backward chaining, Resolution - Learning - Learning from observations – forms of learning

**MODULE - V**
An Overview of Prolog - An example program: defining family relations - Extending the example program by rules -A recursive rule definition - How Prolog answers questions - Declarative and procedural meaning of programs - Syntax and Meaning of Prolog Programs - Lists, Operators, Arithmetic - Using Structures: Example Programs

**Text Books:**
OPEN ELECTIVE – IV: INTRODUCTION TO E-COMMERCE

Prerequisite: Knowledge of computer networks

Objectives:
- To learn both the technical and business-related implications of electronically mediated commerce.
- To learn the development of electronic business from its origins in electronic data interchange to its current growing importance.
- To learn the potential of electronic business for future development and the development of the ‘Information Society’ and ethical issues facing business organizations in their daily use of the Internet

MODULE – I
Introduction to e-commerce – benefits of e-commerce – impact of e-commerce – classification of e-commerce – Web 2.0 based social networking platform for social media e-commerce – application of e-commerce technologies

MODULE – II

MODULE – III

MODULE - IV

MODULE – V

Text Book:
CORE 21: MICROPROCESSORS AND MICROCONTROLLERS

Prerequisite: Knowledge of computer organization

Objectives:
- To understand the architectures and the instruction set of 8085 microprocessor
- To understand the architectures and the instruction set of 8086 microprocessor
- To understand the architectures and the instruction set of 8051 microcontroller
- To learn the assembly language program using 8085, 8086 and 8051 instructions
- To learn interfacing of microprocessors and microcontrollers with various devices

MODULE – I

MODULE – II
Intel 8085 Interrupts and DMA: 8085 Interrupts – Software and Hardware Interrupts – 8259 Programmable Interrupt Controller - Data Transfer Techniques – Synchronous, Asynchronous and Direct Memory Access (DMA) and 8237 DMA Controller - 8253 Programmable Interval Timer.

MODULE – III

MODULE – IV

MODULE – V

Text Books:
CORE 22: COMPUTER LAB & PROJECT

Lab -IX: MICROPROCESSOR LAB

LIST OF EXERCISES

1. Basic Arithmetic and Logical Operations 16 Bit Addition
2. Basic Arithmetic and Logical Operations 16 Bit Subtraction
3. Basic Arithmetic and Logical Operations 16 Bit Multiplication
4. Basic Arithmetic and Logical Operations 16 Bit Division
5. Move a Data Block Without Overlap
7. Code Conversions – Decimal to Hexadecimal
8. Code Conversion – Hexadecimal to Decimal
9. Floating Point Operations- String Manipulations, Sorting and Searching, Copying a String
10. Ascending & Descending
PROJECT

The objective of the project is to motivate them to work in emerging/latest technologies, help the students to develop ability, to apply theoretical and practical tools/techniques to solve real life problems related to industry, academic institutions and research laboratories.

The project is of 2 hours/week for one semester duration and a student is expected to do planning, analyzing, designing, coding, and implementing the project. The initiation of project should be with the project proposal. The synopsis approval will be given by the project guides.

The project proposal should include the following:
- Title
- Objectives
- Input and output
- Details of modules and process logic
- Limitations of the project
- Tools/platforms, Languages to be used
- Scope of future application

The project work should be either an individual one or a group of not more than three members and submit a project report at the end of the semester. The students shall defend their dissertation in front of experts during viva-voce examinations.
B.A., B.Ed.

PART III

SPECIALIZATION OF THE SUBJECTS
(MAIN)

HISTORY
GEOGRAPHY
ENGLISH
HINDI
PART III

HISTORY
### B.A., B.Ed. LIBERAL OPTIONS

**PART III: B.A.B.ED.**

**Branch: HISTORY**

<table>
<thead>
<tr>
<th>SEM</th>
<th>No.</th>
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<th>CCE</th>
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Post- Mauryan Period- The Indo-Greeks, Minanader -The Satavahanas,Western Satraps– Sakas Kushanas, Kanishka- Socio-economic changes in Post-Mauryan Period

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India on the Eve of Arab Invasion- Arab Conquest of Sind –The invasions of Mohammad of Ghazani –The invasions of Mohammad of Ghur - Causes for the defeat of the Indian rulers

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Unit V

Administration of Delhi Sultanate- Concept of Sovereignty- Central administration- Iqta system-Economic and Social life under the Delhi Sultanate- Art and Architecture- Bhakti Movement

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CORE 3: INTRODUCTION TO ANCIENT CIVILIZATIONS

Unit I
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Unit IV
Chinese civilization; Society, economy and Religion

Unit V
Greek and Roman civilizations- Roman Society and Culture- Rise of Christianity

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Unit II

Indian Executive- President–Powers and Functions – Prime Minister and Council of Ministers, Powers and functions –Relation with the council of Ministers and Parliament.

Unit III

Indian Legislature: Composition, Powers and Functions –Legislative procedures- Indian Judiciary–Powers of the Supreme Court

Unit IV

Relation between the Union and States –Sarkaria Commission and its recommendation and Implementation –Important Amendments

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CORE 5: HISTORY OF INDIA 1526- 1707 C.E.

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Babur’s Conquests and Founding of the Mughal Empire- Humayun- Sher Shah’s rise to power and administration

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Akbar- Conquests, Administration, Mansabdari System, Land Revenue system- Religious policy- Rajput policy- Jahangir’s career- Nurjahan

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Causes for the decline of the Roman Empire- Characteristic features of Medieval period – Merovingian Dynasty - Clovis- Carolingian dynasty - Charlemagne

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Unit IV
Medieval Contacts: Rise of Islam—Ummayids and Abbasids- State, Society and Economy under Caliphs–Education

Unit V
Islam and Europe- Crusades- Effects- Fall of Constantinople- Technological and Military Revolution

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Reformation–Counter Reformation- Ignatius Loyola

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Unit IV
Rise of Nation States, Enlightened Despotism, Revolutions: Glorious Revolution 1688, Industrial Revolution and Factory System

Unit V
Louis XVI and Europe on the Eve of French Revolution

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Reference Books

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CORE 10: HISTORY OF INDIA 1858-1947 C.E.

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CORE 11: HISTORY OF EUROPE 1789- 1871 C.E.

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French Revolution- Causes, Course and Consequences- Rise and Fall of Napoleon Bonaparte- Reforms and foreign policy, Continental System, Battle of Waterloo

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The Eastern Question- Decline of Ottoman Empire- Serbian Revolutions- Greek war of Independence- Crimean war- Treaty of Frankfurt

Unit IV

Paris Commune –1871 and its significance

Unit V

Unification of Italy and Germany

Reference Books

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3. Grant and Temperley, Europe in 19th and 20th century
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CORE 12: (SUPPORTIVE 3) ECONOMICS I - INDIAN ECONOMY

Unit 1: Indian Economy during the Colonial Period
People, resources and institutions in the pre-independent India – Structure of Indian villages, land and agriculture, traditional industries and handicrafts, infrastructure – urban centres, roadways, railways and ports, economic consequences of the Colonial rule and the theory of drains.

Unit 2: Indian Economy at the time of Independence
Structure of the Indian economy – natural resources – land, forest, mineral resources, fisheries; national income and contributions from various sectors; theory of demographic transition, age and sex ratio, density of population, social infrastructure.

Unit 3: Planning in India
Need for planning in India, objectives, overview of plans in India – approaches, outlays, targets and priorities, broad achievements and failures, new-economic reforms, Liberalization, Privatisation, and Globalisation – rationale behind new economic reforms, progresses during the post-reform period.

Unit 4: Planning and Indian Agriculture
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Reference Book:
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Unit I
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CORE 14: HISTORY OF SOUTH INDIA UPTO 1335 C.E.

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Reference Books

1. R. Champakalakshmi, Trade, Ideology and Urbanization : South India 300 BC to AD 1300 (1996)
8. Subbarayalu, South India under Cholas
9. Vedachalam, South India under Cholas
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Reference Books

8. Williams, Current & Freidel, A History of United States to 1877
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Definition, Functions and Theories of Money  
- advantages of money – banking – nature and functions of banks – process of credit creation – Gurley and Shaw hypothesis – NBFIs - money and banking in the era of globalisation.

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CORE 18: INDIA SINCE INDEPENDENCE 1947 –2000 C.E.

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CORE 19: INTERNATIONAL RELATIONS 1945 – 2000 C.E.

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Reference Books

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CORE 21: HISTORY OF USA 1865 –1945 C.E.

Unit I
Presidential Reconstruction- Congress Reconstruction and Radical Reconstruction

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Reference Books

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Reference Books
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PART III

GEOGRAPHY
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CORE 1: PHYSICAL GEOGRAPHY

2. Earth Movements: Plate Tectonics, Types of Folds and Faults, Earthquakes and Volcanoes. (Types and Distribution)

Reading List

CORE 2: CARTOGRAPHIC TECHNIQUES (P)

1. Cartography – History and Importance of cartography
2. Scales – Concept and application; Graphical Construction of Plain, Comparative and Diagonal Scales.
4. Topographical Map – Interpretation of a Mountain area with the help of Cross and Longitudinal Profiles.
5. Slope Analysis – Wentworth’s method.

Practical Record:

A Project File in pencil, comprising one exercise each, on scale, map projection, interpretation of topographic sheet and slope analysis.

Reading List

CORE 3: HUMAN GEOGRAPHY

1. **Introduction**: Defining Human Geography; Major Themes, (Determinism, Possibilism, Neo determinism), emergence of man, Race of Mankind,

2. **Population**: Population Growth and Distribution; Population Composition; Demographic Transition Theory

3. **Settlements**: Types of Rural Settlements; Classification of Urban Settlements; Trends and Patterns of World Urbanization

4. **Population-Resource Relationship** (Population problems of developed & developing countries,

**Reading List**

CORE 4: (SUPPORTIVE 1) CIVICS I- INDIAN CONSTITUTION

Unit I


Unit II

Indian Executive- President–Powers and Functions – Prime Minister and Council of Ministers, Powers and functions –Relation with the council of Ministers and Parliament.

Unit III

Indian Legislature: Composition, Powers and Functions –Legislative procedures- Indian Judiciary–Powers of the Supreme Court

Unit IV

Relation between the Union and States –Sarkaria Commission and its recommendation and Implementation –Important Amendments

Reference Books

1. Agarwal, R.C., Constitutional Development and National Movement of India,
CORE 5: MAP PROJECTION (P)

1. **Map Projection**: Definition, significance and types. Choices of map projections.

2. **Construction, properties, merits, demerits and uses of Conical Projections**: Conical Projection with two standard parallels, Polyconic Projection and Bonne’s Projection.

3. **Construction, properties, merits, demerits and uses of Zenithal Projections**: Gnomonic, Stereographic, Orthographic, Equidistant and Equal Area Projection.


**Reading List:**

CORE 6: ECONOMIC GEOGRAPHY

1. **Introduction**: Concept and classification of economic activity

2. Factors Affecting location of Economic Activity with special reference to Agriculture (Von Thunen theory), Industry (Weber’s theory).

3. **Primary Activities**: Subsistence and Commercial agriculture, forestry, fishing and mining.

4. **Secondary Activities**: Manufacturing (Cotton Textile, Iron and Steel), Concept of Manufacturing Regions, Special Economic Zones and Technology Parks.

5. **Tertiary Activities**: Transport, Trade and Services, & Quaternary activities

**Reading List**

CORE 7: THEMATIC MAPPING TECHNIQUES (P)

1. Map Scale, Types

2. Map classification and Types; Principles of Map Design.


Practical Record: A Thematic Atlas should be prepared on a specific theme with five plates of any state in India.

Reading List

CORE 8: (SUPPORTIVE 2) CIVICS II - INTRODUCTION TO HUMAN RIGHTS

Unit I

Unit II
Civil and political Rights – Social and Economic Rights – Women’s Rights – Children’s Rights

Unit III

Unit IV
National Human Rights Commission (NHRC) - State Human Rights Commission (SHRC) - Non Governmental Organizations - International Human Rights Organizations (UN).

Reference Books
1. Fleiner, Thomas, What is Human Rights, Federation Press, NSW, 1999
2. Griffin, James, On Human Rights, OUP, New Delhi, 2008
3. Muthirulandi, Raja, Human Rights, PHI Learning, New Delhi, 2000
5. Selvam, S., Human Rights Education: Modern Approaches and Strategies, Concept, New Delhi, 1970
CORE 9: CLIMATOLOGY

1. Composition and Structure of atmosphere – Variation with Altitude, Latitude and Season.


4. Atmospheric Moisture – Evaporation, Humidity, Condensation, Fog and Clouds, Precipitation Types, Air Mass, Climatic Regions (Koppen)


Reading List

CORE 10: STATISTICS METHODS IN GEOGRAPHY. (P)

1. **Use of Data in Geography:** Geographical Data Matrix, Significance of Statistical Methods in Geography; Sources of Data.

2. **Tabulation and Descriptive Statistics:** Frequencies (Deciles, Quartiles), Cross Tabulation, Central Tendency (Mean, Median and Mode, Dispersion (Standard Deviation, Variance and Coefficient of Variation).

3. **Sampling:** Purposive, Random, Systematic and Stratified.

4. **Theoretical Distribution:** Probability and Normal Distribution.

5. **Association and Correlation:** Rank Correlation, Product Moment Correlation, and Simple Regression.

**Class Record:** Each student will submit a record containing five exercises:

1. Construct a data matrix of about \((10 \times 10)\) with each row representing an areal unit (districts or villages or towns) and about 10 columns of relevant attributes of the areal units.

2. Based on the above table, a frequency table, measures of central tendency and dispersion would be computed and interpreted for any two attributes.

3. Histograms and frequency curve would be prepared on the entire data set and attempt to fit a normal curve and interpreted for one or two variables.

4. From the data matrix a sample set (20 Percent) would be drawn using, random - systematic and stratified methods of sampling and locate the samples on a map with a short note on methods used.

5. Based on of the sample set and using two relevant attributes, a scatter and regression line would be plotted and residual and regression line would be mapped with a short interpretation.

**Reading List**

1. Berry B. J. L. and Marble D. F. (eds.): *Spatial Analysis – A Reader in Geography.*
CORE 11: POPULATION GEOGRAPHY

1. Defining the Field – Nature and Scope; Sources of Data with special reference to India (Census, Vital Statistics and NSS).


4. Population Composition and Characteristics – Age-Sex Composition; Rural and Urban Composition; Literacy.

5. Contemporary Issues – Ageing of Population; Declining Sex Ratio; HIV/AIDS.

Reading List

CORE 12: (SUPPORTIVE 3) ECONOMICS I - INDIAN ECONOMY

Unit 1: Indian Economy during the Colonial Period
People, resources and institutions in the pre-independent India – Structure of Indian villages, land and agriculture, traditional industries and handicrafts, infrastructure – urban centres, roadways, railways and ports, economic consequences of the Colonial rule and the theory of drains.

Unit 2: Indian Economy at the time of Independence
Structure of the Indian economy – natural resources – land, forest, mineral resources, fisheries; national income and contributions from various sectors; theory of demographic transition, age and sex ratio, density of population, social infrastructure.

Unit 3: Planning in India
Need for planning in India, objectives, overview of plans in India – approaches, outlays, targets and priorities, broad achievements and failures, new-economic reforms, Liberalization, Privatisation, and Globalisation – rationale behind new economic reforms, progresses during the post-reform period.

Unit 4: Planning and Indian Agriculture
Land and agriculture in India – land, climate and irrigational infrastructure; land reforms and its implementation across states, green revolution and the advent of HYV seeds, green revolution in retrospect – pros and cons; Nationalization of banks and farmers’ access to formal credit and its social implications.

Unit 5: Indian Industries
Role of Indian industries – industrial development during the planning period – industrial policies – licensing policy – growth and problems of some large scale industries: iron and steel, cotton, jute, sugar and cement – growth and problems of small scale enterprises – role, growth and problems of public sector enterprises in India.

Reference Book:
12. Uma Kapila (Ed), Indian Economy since Independence, Academic Foundation, EPW articles.
CORE 13: URBAN GEOGRAPHY

1. Urban geography: Introduction, Origin of Urbanisation, Urban Morphology, major aspect of Urbanisation

2. Patterns of Urbanisation in developed and developing countries

3. Functional classification of cities: Quantitative and Qualitative Methods

4. Urban Issues: problems of housing, slums, civic amenities (water and transport)

5. Case studies of Delhi, Mumbai, Kolkata, Chennai, Chandigarh and Port Blair with reference to Land use and Urban Issues

Reading List

CORE 14: GEOGRAPHY OF HEALTH AND WELL BEINGS

1. Perspectives on Health: Definition; linkages with environment, development and health; driving forces in health and environmental trends - population dynamics, urbanization, poverty and inequality.

2. Pressure on Environmental Quality and Health: Human activities and environmental pressure land use and agricultural development; industrialisation; transport and energy.

3. Exposure and Health Risks: Air pollution; household wastes; water; housing; workplace.

4. Health and Disease Pattern in Environmental Context with special reference to India, Types of Diseases and their regional pattern (Communicable and Lifestyle related diseases).

5. Climate Change and Human Health: Changes in climate system – heat and cold; Biological disease agents; food production and nutrition.

Reading List:

CORE 15: ISLAND STUDIES

1. Introduction of Island studies: emerging interdisciplinary and comparative study of island and archipelagos-cultures-geography of islands and island states-historical development-environment issues.

2. Island biogeography-physical features-climate-ecosystem, biodiversity-flora and fauna ecosystem processes-island vulnerability-managing beach resource-coastal resource and island tourism-is sustainability possible?

3. Island migration dependency and in equality- globalisation, new labour migration and development of islands-government policy to support migrant workers-promoting sustainable rural coastal and island communities.


5. Integrated Coastal zone management plan for India islands-existing management regulations and local level policy, coastal erosion and shore protection, conflicts and perceptions of the stakeholders in Islands.

(A field trip to any place in Andaman and Nicobar Islands and to submit a report of 25 marks)

References


CORE 16: (SUPPORTIVE 4) ECONOMICS II - MONEY AND BANKING

Unit 1: Concept of Money and Banking
Definition, Functions and Theories of Money

Unit 2: Demand for Money
Theories of demand for money: classical approach, the transactions and cash balance approach, Keynesian analysis, post-Keynesian developments, monetarist approach.

Unit 3: Money Supply
Theories of money supply – mechanistic model of money supply determination – high powered money and behavioral model of money supply determination – methods of monetary control – Interest rates in closed and open economies.

Unit 4: Central Banking
Functions of a central bank – quantitative and qualitative methods of credit control – bank rate policy, open market operations, cash reserve ratio, selective methods – banking regulation and supervision – Basel prudential norms on capital adequacy and NPA management.

Unit 5: Conduct of Monetary Policy in India
Monetary Policy
Role and functions of Reserve Bank of India (RBI) – evolution of RBI’s monetary policy – Objectives, Instruments and targets of monetary policy in India – operating procedure – lags in monetary policy – rules versus discretion debate – limitations of monetary policy with special reference to India.

Reference
CORE 17: GEOGRAPHY OF TOURISM

1. **Scope and Nature**: Concepts and Issues, Tourism, Recreation and Leisure Inter-Relations; Geographical Parameters of Tourism by Robinson.

2. **Type of Tourism**: Nature Tourism, Cultural Tourism, Medical Tourism, Pilgrimage

3. **Recent Trends of Tourism**: International and Regional; Domestic (India); Eco-Tourism, Sustainable Tourism, Meetings Incentives Conventions and Exhibitions (MICE)

4. **Impact of Tourism**: Economy; Environment; Society

5. **Tourism in India**: Tourism Infrastructure; Case Studies of Himalaya, Desert and Coastal Areas; National Tourism Policy, Andaman Islands: Factor influencing tourism, Structure, Mode of transport, Major tourist spots.

**Reading List**

6. Tourism Recreation and Research Journal, Center for Tourism Research and Development, Lucknow
CORE 18: GEOGRAPHY IN INDIA

1. India in the context of the world and Asia. Relief, climate, drainage, soil and natural vegetation. Marine resources.

REFERENCES.

CORE 19: AGRICULTURAL GEOGRAPHY

1. Defining the Field: Introduction, nature and scope; Land use/land cover definition and classification.

2. Determinants of Agriculture: Physical, Technological and Institutional

3. Agricultural Regions of India: Agro-climatic, Agro-ecological & Crop Combination Regions.

4. Agricultural Systems of the World (Whittlesey’s classification) and Agricultural Land use model (Von Thuenen, modification and relevance).

5. Agricultural Revolutions in India: Green, White, Blue, Pink

Reading List

CORE 20: POLITICAL GEOGRAPHY


2. State, Nation and Nation State – Concept of Nation and State, Attributes of State – Frontiers, Boundaries, Shape, Size, Territory and Sovereignty, Concept of Nation State; Geopolitics; Theories (Heartland and Rimland)

3. Electoral Geography – Geography of Voting, Geographic Influences on Voting pattern, Geography of Representation, Gerrymandering.


5. Politics of Displacement: Issues of relief, compensation and rehabilitation: with reference to Dams and Special Economic Zones

Reading List

CORE 21: WATER MANAGEMENT

1. Sources of water, Atmospheric relationship of water: rainfall and temperature, evapotranspiration, rainfall and runoff relationship, hydrological cycle. Rain harvesting as strategies of water resource conservation, other strategies of water conservation; water recycling.


3. Watershed management; concept of watershed; morphological units, morphogenetic classification, morphometric analysis, importance of watershed protection and approaches to watershed protection, watershed management.


Reading List:

CORE 22: CLIMATIC CHANGE: VULNERABILITY & ADAPTATION

1. Science of Climate Change: Understanding Climate Change; Green House Gases and Global Warming; Global Climatic Assessment- IPCC

2. Climate Change and Vulnerability: Physical Vulnerability; Economic Vulnerability; Social Vulnerability

3. Impact of Climate Change: Agriculture and Water; Flora and Fauna; Human Health


5. National Action Plan on Climate Change; Local Institutions (Urban Local Bodies, Panchayats)

Further Readings


PART III

ENGLISH
### B.A., B.Ed. LIBERAL OPTIONS

**PART III: B.A.B.ED.**  
Branch: ENGLISH

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CORE 1: INDIAN WRITING IN ENGLISH

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<tr>
<th>Objectives:</th>
<th>To introduce students to different genres of Indian writing in English</th>
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2. Sarojini Naidu, ‘Palanquin Bearers’  
3. Nissim Ezekiel, ‘Enterprise’  
4. Kamala Das, ‘The Old Play House’  
5. Shiv. K.Kumar, ‘Indian Women’ |
2. Dr. Abdul Kalam, “My Visions for India” |
| UNIT 4: Drama | Manjula Padmanabhan, *Harvest* |
Sudha Murthy, ‘Humility in Sahyadri Hills’ |

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William Hazlitt, “On Reading Old Books” |
| UNIT – 4 | Russell, ‘An Ideal Individual’  
G.K. Chesterton, ‘Advantages of Having One Leg’ |
| UNIT – 5 | Doris Lessing, ‘The Golden Book’  
Orwell, ‘Sporting Spirit’ |

CORE 3: POETRY

| Objectives: | To introduce students to the poetic thought down the ages. Selections from the  
The Winged Word (Ed. David Greene, Macmillan) |
|-------------|--------------------------------------------------------------------------------------------------|
| UNIT – 1 | 1. William Shakespeare, Sonnet 116 ‘Let me not to the marriage of true minds’  
2. John Donne, ‘The Sun Rising’  
5. William Blake, ‘Chimney Sweeper’ |
7. S.T.Coleridge, ‘Kubla Khan’  
8. P.B.Shelley, ‘Ode to the Sky Lark’  
9. John Keats, ‘Ode to a Nightingale’ |
| UNIT – 4 | 10. Robert Browning, ‘My Last Duchess’  
11. Lord Tennyson, ‘Lotus Eaters’ |
| UNIT – 5 | 12. W. B. Yeats, ‘The Second Coming’  
13. Ted Hughes, Thought Fox’  
### CORE 4: (SUPPORTIVE 1) - COMMUNICATION SKILLS

**Objectives:** To familiarize the students with the patterns of English Language.

| UNIT – 1 | To impart speaking skills.  
| | Effective communication / miscommunication  
| | The secrets of good conversation |
| UNIT – 2 | Talking to strangers  
| | Talking to familiar people |
| UNIT – 3 | Telephone conversation  
| | Interviews |
| UNIT – 4 | Group Discussion |
| UNIT – 5 | Public Speech - Compering |


### CORE 5: FICTION

**Objectives:** to familiarize students with some master pieces of British Fiction.

| UNIT – 1 | Introducing Fiction |
| UNIT – 2 | Jane Austen, Mansfield Park |
| UNIT – 3 | Charlotte Bronte, Jane Eyre |
| UNIT – 4 | Charles Dickens, Christmas Carol |
| UNIT – 5 | Virginia Woolf, Mrs. Dalloway |

### CORE 6: HISTORY OF ENGLISH LITERATURE

**Objectives:** To facilitate an appreciation of literature by providing a brief survey of British literature through ages and to introduce students to the best works of each age.

| UNIT – 1 | Elizabethan Age. |
| UNIT – 2 | Augustan Age. |
| UNIT – 3 | Romantic Age. |
| UNIT – 4 | Victorian Age |
| UNIT – 5 | Modern Age |

**Reference:** 1. History of English Literature by E.Albert  
2. History of English Literatureby Hudson.
### CORE 7: ENGLISH LANGUAGE AND LINGUISTICS

**Objectives:** To introduce students to the sound system and the structure of English Language.

<table>
<thead>
<tr>
<th>UNIT – 1</th>
<th>Introduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>UNIT – 2</td>
<td>Phonetics</td>
</tr>
<tr>
<td>UNIT – 3</td>
<td>Phonology</td>
</tr>
<tr>
<td>UNIT – 4</td>
<td>Morphology</td>
</tr>
<tr>
<td>UNIT – 5</td>
<td>Syntax</td>
</tr>
</tbody>
</table>

**Reference:** A Text book of English Phonetics and Structure for Indian Students by V. Shyamala (Sharath Ganga Publishers, Trivandrum)

### CORE 8: (SUPPORTIVE 2) - ENGLISH FOR COMPETITIVE EXAMINATIONS

| UNIT – 1 | Basics of English  
|Spotting Errors |
|----------|------------------|
| UNIT – 2 | Sentence Completion |
| UNIT – 3 | Reading comprehension  
|Précis Writing |
| UNIT – 4 | Foreign Expressions  
|Idioms and Phrases |
| UNIT – 5 | Letter Writing  
|Writing Reports  
|General Essays |

**Reference**
1. F T Wood: *A Remedial English Grammar for Foreign Students.* (Macmillan)
2. R.P. Bhatnagar and Rajul Bhargava: *English for Competitive Examinations* (Macmillan)

### CORE 9: BRITISH DRAMA

**Objectives:** To introduce students to British Drama

<table>
<thead>
<tr>
<th>UNIT – 1</th>
<th>Introducing Drama - Origin and development of British Drama</th>
</tr>
</thead>
<tbody>
<tr>
<td>UNIT – 2</td>
<td>Marlowe, <em>Doctor Faustus</em></td>
</tr>
<tr>
<td>UNIT – 3</td>
<td>Oscar Wilde, <em>The Importance of Being Earnest.</em></td>
</tr>
<tr>
<td>UNIT – 4</td>
<td>T.S. Eliot, <em>Murder in the Cathedral</em></td>
</tr>
<tr>
<td>UNIT – 5</td>
<td>Osborn, <em>Look Back in Anger</em></td>
</tr>
</tbody>
</table>

Eng_5
### CORE 10: LITERARY FORMS

**Objectives:** To introduce students to various types of Drama and Literary Terms.

<table>
<thead>
<tr>
<th>UNIT</th>
<th>Topic</th>
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</thead>
<tbody>
<tr>
<td>UNIT – 1</td>
<td>Literary Terms</td>
</tr>
<tr>
<td>UNIT – 2</td>
<td>Poetry</td>
</tr>
<tr>
<td>UNIT – 3</td>
<td>Prose</td>
</tr>
<tr>
<td>UNIT – 4</td>
<td>Drama</td>
</tr>
<tr>
<td>UNIT – 5</td>
<td>Fiction</td>
</tr>
</tbody>
</table>

**Reference:**
1. English Literary Forms: A Background to the Study of English Literature by Prasad
2. The Oxford Dictionary of Literary terms.

---

### CORE 11: LITERARY CRITICISM

**Objectives:** To introduce students to the evolution of critical thoughts.

<table>
<thead>
<tr>
<th>UNIT</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>UNIT – 1</td>
<td>Classical – Aristotle, Horace, Longinus</td>
</tr>
<tr>
<td>UNIT – 2</td>
<td>Dr. Johnson – Preface to Shakespeare,</td>
</tr>
<tr>
<td>UNIT – 4</td>
<td>I. A. Richards – “Four Kinds of Meaning”</td>
</tr>
</tbody>
</table>

**Reference:**

---

### CORE 12: (SUPPORTIVE 3)- TRANSLATION STUDIES

**Objectives:** To acquaint the students with theories of Translation.

<table>
<thead>
<tr>
<th>UNIT</th>
<th>Topic</th>
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</thead>
<tbody>
<tr>
<td>UNIT – 1</td>
<td>Introduction to Translation Theories</td>
</tr>
<tr>
<td>UNIT – 2</td>
<td>History of Translation</td>
</tr>
<tr>
<td>UNIT – 3</td>
<td>Key concepts in Translation Studies</td>
</tr>
<tr>
<td>UNIT – 4</td>
<td>Problems of Translation</td>
</tr>
<tr>
<td>UNIT – 5</td>
<td>Recent Translation Theories</td>
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</table>

**Reference:**

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### CORE 13: SHAKESPEARE

**Objectives:** To introduce students to the works of Shakespeare

<table>
<thead>
<tr>
<th>UNIT</th>
<th>Topic</th>
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</thead>
<tbody>
<tr>
<td>UNIT – 1</td>
<td>Introduction to Shakespeare</td>
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<tr>
<td>UNIT – 2</td>
<td><em>Macbeth</em></td>
</tr>
<tr>
<td>UNIT – 3</td>
<td><em>Julius Caesar</em></td>
</tr>
<tr>
<td>UNIT – 4</td>
<td><em>As You Like it</em></td>
</tr>
<tr>
<td>UNIT – 5</td>
<td><em>Measure for Measure</em></td>
</tr>
</tbody>
</table>
**CORE 14: AMERICAN LITERATURE**

<table>
<thead>
<tr>
<th>Objectives: To give an overview of American writings.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>UNIT – 1</strong></td>
</tr>
</tbody>
</table>
| **UNIT – 2** | 1. Walt Whitman – “O Captain My Captain”  
2. Emily Dickinson – “Success is counted sweetest”  
5. Maya Angelou – “When the Caged Bird Sings” |
| **UNIT – 3** | Eugene O’neil – Hairy Ape |
| **UNIT – 4** | Hemingway – *Old Man and the Sea* |
| **UNIT – 5** | Alice Walker – *In search of My Mother’s Garden* |

**CORE 15: NEW LITERATURES IN ENGLISH**

*Post-Colonial Literature*

<table>
<thead>
<tr>
<th>Objectives: To introduce the literature of the marginalized and the subaltern.</th>
</tr>
</thead>
</table>
| **UNIT – 1 PROSE** | 1. Chapter 1 in *New Literatures in English: Cultural Nationalism in a Changing World* by Bruce King.  
| **UNIT – 2 POETRY** | 1. Atwood – ‘Photograph of me’.  
2. Emily Liang – ‘United We Stand’.  
3. A.D. Hope – ‘Australia’  
4. Allen Curnow – ‘House and Land’ |
| **UNIT – 3 DRAMA** | Douglas Stewart – *Ned Kelly* |
| **UNIT – 4 FICTION** | Chimamanda Adichi – *Purple Hibiscus* |
| **UNIT – 5 SHORT STORY** | Chinua Achebe – ‘Marriage is a Private Affair’ |

**CORE 16: (SUPPORTIVE 4)- INDIAN CULTURE THROUGH LITERATURE**

<table>
<thead>
<tr>
<th>Objectives: To Introduce the students to notions of Culture and familiarize them with the history of Indian Culture through Literature.</th>
</tr>
</thead>
</table>
| **UNIT – 1 PROSE** | Sri Aurobindo- ‘The Renaissance in India’  
A.K Ramanujan- ‘Where Mirrors are Windows’  
Michel Danino- ‘Effects of Colonisation’ |
| **UNIT – 2 POETRY** | Swami Vivekananda- “Angel Unawares”  
Rabindranath Tagore –“Freedom”  
Toru Dutt –“Lakshman” |
| **UNIT – 3 DRAMA** | Girish Karnad - *Nagamandala* |
| **UNIT – 4 FICTION** | Neela Padmanaban- *Generations* |
| **UNIT – 5 SHORT STORIES** | Devdutt Pattanaik - *Indian Mythology* |
CORE 17: ENGLISH FOR MASS MEDIA


CORE 18: LITERATURE IN TRANSLATION

**Objectives:**
- To introduce students to the art of Translation through works of Literature
- To lead them to National and Global Literature through Translation

| UNIT – 1 | A.K.Ramanujan – “Hymns for the Drowning”
|          | Pablo Neruda – “Ode to Hope”
|          | V.V.S.Iyer – “Thirukkural”
|          | Octavia Paz – “No More Clichés”
| UNIT – 2 | Pushkin – “The Tale of Tsar Saltan”
| UNIT – 3 | Jayamohan – “The Elephant Doctor”
| UNIT – 4 | Thagazhi Sivasankaram Pillai – *Chemeen*
| UNIT – 5 | Antoine de Saint-Exupéry- *The Little Prince*
|          | Herman Hesse – *Siddhartha*

CORE 19: CONTEMPORARY LITERARY THEORIES

| UNIT – 1 | Marxism
|          | Subaltern Studies
| UNIT – 2 | Post Colonialism
| UNIT – 3 | Post Modernism
| UNIT – 4 | Eco-criticism
| UNIT – 5 | Gender Studies
| **Reference** | Peter Barry – ‘Beginning Theory’ (Latest Edition)

CORE 20: ADVANCED ENGLISH GRAMMAR

Text: Advanced English Grammar by Raymond Murphy (OUP)
### CORE 21: WOMEN WRITING

<table>
<thead>
<tr>
<th>UNIT – 1</th>
<th>POETRY</th>
<th>Elizabeth Bishop - ‘I am in Need of Music’ Halina Poswiatowska - ‘It’s we who gave birth…’ Adrienne Rich – ‘Diving into the Wreck’ Gaurie Desponde – ‘Female of the Species’</th>
</tr>
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<tbody>
<tr>
<td>UNIT – 2</td>
<td>PROSE</td>
<td>Leila Seth - <em>Talking of Justice</em> (Chapter on women’s rights) Chandra Talpade – “Under Western Eye”</td>
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<tr>
<td>UNIT – 3</td>
<td>SHORT STORY</td>
<td>Mahaswetha Devi – <em>Rudali</em></td>
</tr>
<tr>
<td>UNIT – 4</td>
<td>FICTION</td>
<td>Monica Ali - <em>The Brick Lane</em></td>
</tr>
<tr>
<td>UNIT – 5</td>
<td></td>
<td><em>Lights and Shadows</em> (Collection of Short stories)</td>
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### CORE 22: GREEN LITERATURE

**Objectives:** To create Environmental Consciousness through a study of Literature.

<table>
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<tr>
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<tbody>
<tr>
<td>UNIT – 2</td>
<td>PROSE</td>
<td>Rabindranath Tagore – ‘She Dwelt on the Hill side’ Sarojini Naidu – ‘Autumn Song’</td>
</tr>
<tr>
<td>UNIT – 3</td>
<td>DRAMA</td>
<td>Thoreau – ‘Where I lived and what I lived for’</td>
</tr>
<tr>
<td>UNIT – 4</td>
<td>DRAMA</td>
<td>Chekhov – <em>The Cherry Orchard</em></td>
</tr>
<tr>
<td>UNIT – 5</td>
<td>FICTION</td>
<td>Indra Sinha - <em>Animal’s People</em></td>
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PART III

HINDI
<table>
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<tr>
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<th>UE</th>
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<td>ANUVAD SIKSHAN</td>
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<td>II</td>
<td>Core 5</td>
<td>Main 4</td>
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<td>Core 7</td>
<td>Main 6</td>
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<tr>
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<td>Core 8 (Supportive 2)</td>
<td>Anci 1-2</td>
<td>RAJBHASHA PRASIKSHAN</td>
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<td>III</td>
<td>Core 9</td>
<td>Main 7</td>
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<td>Main 13</td>
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<td>VI</td>
<td>Core 19</td>
<td>Main 15</td>
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<td>Main 16</td>
<td>NIBANDH TATA ANYA GADHYA VIDAYEN</td>
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<tr>
<td>VII</td>
<td>Core 21</td>
<td>Main 17</td>
<td>BHSHA VIGYAN</td>
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<td>VIII</td>
<td>Core 22</td>
<td>Main 18</td>
<td>BHARATIYA SAHITYA</td>
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</tbody>
</table>
Core 1 - हिन्दी कथा साहित्य - I (कहानी)

पाठ्य विषय
खण्ड : ‘क’ कहानी की परिभाषा, सृजन, तत्त्व एवं पुस्तक, कहानी और अन्य गद्याध्यायों अन्तर, हिन्दी कहानी उद्धव और विकास
खण्ड : ‘ख’ क्याबूया एवं विवेचन के लिए निर्धारित ‘हिन्दी की पुस्तिनिधि कहानियाँ’ सम्पा. डॉ. कृष्ण रेना, वाणी पुस्तक, नई दिल्ली।

1. उसने कहा था – चंद्रधि गुलेरी 2. पूस की रात - प्रेमचंद
3. पुस्तक - जयशंकर प्रसाद 4. नारंगियाँ - अजेय
5. अकेली - मदु भंडारी 6. वापसी - उषा हप्रयंवदा

प्रश्नों के लिए सहायक पुस्तकें

• कहानी स्वरूप और संवेदना, राजेंद्र यादव, नेशनल पुस्तिनिधि हाउस, दिल्ली
• हिन्दी कहानी : उद्धव और विकास, मुरेश सिन्हा अशोक प्रकाशन, इलाहाबाद
• हिन्दी कहानी की शिलां विधि का विकास, लक्ष्मीनारायण लाल साहित्य भवन, इलाहाबाद
• कहानी नथी कहानी, नामवर तिह, लोकभारती प्रकाशन, इलाहाबाद
• हिन्दी कहानी का इतिहास, डॉ. लालचंद्र गुप्त भंग्लों राधाकृष्ण प्रकाशन दिल्ली
• हिन्दी कहानी का इतिहास, गोपाल राय, राजकमल प्रकाशन दिल्ली
Core 2 - पुष्पोजनमूलक हिंदी - I
(पत्रकारिता, मीडिया लेखन तथा व्याकरण)

पाठ्य विषय

खण्ड : ‘क’

• पत्रकारिता : पत्रकारिता का स्वरूप और वर्तमान परिदृश्य, समाचार लेखन, शीर्षकीकरण, पृष्ठ विवास
• सम्पादन कला : प्रिंट मीडिया, इलेक्ट्रॉनिक मीडिया, फीचर लेखन, पृष्ठ सज्जा एवं प्रस्तुतिकरण
• मीडिया लेखन : संचार भाषा का स्वरूप और वर्तमान संचार व्यवस्था
• प्रमुख जनसंचार माध्यम : प्रेस, रेडियो, टी.वी. फिल्म, वीडियो तथा इंटरनेट
• माध्यमोपयोगी लेखन प्रविधि

खण्ड : ‘ख’

• हिंदी की ध्वनियाँ – स्वर और व्यंजन – परिचय तथा वर्गीकरण।
• संज्ञा, सर्वनाम, विशेषण, क्रिया विशेषण, अङ्क – भेदोपभेद सहित।
• लिंग और वचन
• कारक
• बायक रचना

अध्ययन के लिए सहायक पुस्तकें

• हिंदी पत्रकारीता विविध आयाम (भाग 1 तथा भाग 2) सम्पा; बेंद्रपताप बैदिक, हिंदी बुक सेंटर, दिल्ली
• पत्रकारिता के विविध रूप, रामचंद्र लिचारी, आलेख प्रकाशन, दिल्ली
• जन माध्यम और पत्रकारिता (भाग 1 तथा भाग 2) प्रवीण दीपक, मह्योगी, साहित्य संस्थान, कानपुर
• जनसंचार माध्यम, सम्प्रेषण और विकास, देवेन्द्र इस्सर, इन्द्रप्रस्थ प्रकाशन, दिल्ली
• प्रयोजनमूलक हिंदी, विजयपाल सिंह, हिंदी बुक सेंटर, दिल्ली
• आजीविका साधक हिंदी, पुरनचन्द्र टण्डन, नमन प्रकाशन, दिल्ली
Core 3 - हिन्दी कथा साहित्य - II (उपन्यास)

पाठ्य विषय

व्याख्या एवं विवेचन के लिए निर्धारित
‘तमस’ – भीष्म साहिनी

द्वितीय के लिए निर्धारित

- उपन्यास : परिभाषा, स्वरूप, स्वरूप प्रकार उपन्यास और अन्य गद्य विधाओं में अन्तर, हिन्दी उपन्यास उद्देश्य और विकास
- भीष्म साहिनी – जीवन और कथा साहित्य तथा उनका जीवन दर्शन

अध्ययन के लिए सहायक पुस्तकें

- प्रेमचन्द और उनका युग - डॉ. रामचन्द्र शर्मा, राजकमल प्रकाशन, दिल्ली
- कथाकार प्रेमचन्द, रामदरश मिश्र, नेशनल पब्लिशिंग हाउस, दिल्ली
- प्रेमचन्द के उपन्यासों का शिल्प वित्त, कमलकिशोर गोयलनका, सरस्वती प्रेस, दिल्ली
- कलम का सिपाही, अमृतराय हंस प्रकाशन, इलाहाबाद
- काव्य के रूप, गुलाबराय, आत्माराम एण्ड सेंस, दिल्ली
Core 4 (Supportive 1) - अनुवाद शिक्षण

विषय प्रतिपादन –
भाषा मनुष्य द्वारा स्वीकृत और संप्रेरण व्यवस्था है। अनुवाद और भाषा विज्ञान के संबंधों को रेखांकित करने समय यह ध्यान देना आवश्यक है कि भाषा विज्ञान से अनुवाद का संबंध मूलतः अनुवाद सिद्धांत से स्थापित होता है। अनुवाद मूलतः व्यवहार है और भाषा से ही साबित होता है। अनुवाद की विभिन्न परिभाषाओं के आधार पर विभिन्न सिद्धांत प्रतिपादित हुए हैं। विभिन्न के तौर पर यही कहा जाता है कि अनुवाद एक सत्ता भाषा की प्रकृति है। भाषा के साथ-साथ अनुवाद साधन भी है। इसमें जो जितना भाषासतह होगा वह उतना ही अधिक सफल एवं कुशल अनुवाद करोगा। इन सिद्धांतों की सार्वजनिक सिद्ध करने के लिए अनुवादक को सुधी पाठक होना चाहिए।

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संदर्भ ग्रन्थ
1. हिंदी भाषा – डॉ. भोलानाथ तिवारी
2. हिंदी भाषा का उद्भव और विकास – डॉ. उदयनारायण तिवारी
3. व्यावहारिक हिंदी – भाषा विज्ञान- शरद भसीन, मनीष प्रकाशन, दिल्ली
4. काव्यानुवाद की समस्या – डॉ. भोलानाथ तिवारी
5. अनुवाद सिद्धांत और समस्याएं – रविन्द्रनाथ श्रीवास्तव और कुंजुकुमार गोस्वामी आलेख प्रकाशन, दिल्ली
6. व्यावहारिक हिंदी – मं. डॉ. विनोदप्रसिद्ध, द. शा. हि. प्रचार सभा
7. व्यावहारिक हिंदी – डॉ. भोलानाथ तिवारी, आलेख प्रकाशन, दिल्ली।
8. अनुवाद विज्ञान – डॉ. बोला नाथ तिवारी – किताब घर प्रकाशन-, 24/4855, अंसारी रोड दिल्ली, नई, दिल्ली-110 002
9. अनुवाद कला, डॉ. एन. इ. विद्वंदन आयर, प्रकाश प्रकाशन, 4/19, आसिफ-अली रोड, नई दिल्ली – 110 002
10. अनुवाद विज्ञान: सिद्धांत एवं अनुप्रयोग– डॉ. नगेंद्र, हिंदी माध्यम कार्यालय निदेशालय, दिल्ली विद्या विद्यालय, दिल्ली – 110 007
11. अनुवाद : मिद्धां प्रयोग व भाषाएँ – जी. गोपीनाथन, लोकभारती प्रकाशन, पहली मंजिल, महात्मा गाँधी मार्ग, सिविल लाइंस, इलाहाबाद, 211 001.

12. अनुवाद : विज्ञान की भूमिका – कृष्ण कुमार गोस्वामी, राजमल प्रकाशन, प्राइंट्र लिमिटेड, 1 वी. नेताजी सुभाष मार्ग, दरिया गंज, नई दिल्ली-110 002.

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15. भारतीय भाषाएँ और हिंदी अनुवाद, एवं साम्प्रदाय साधारण – (सं) कैलाश, चन्द्र भारट, वाणी प्रकाशन, 21-ए, दयानाद मार्ग, दरिया गंज, नई दिल्ली-110 002.

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18. अनुवाद मिद्धांत एवं व्यवहार– डॉ. जयन्ती प्रसाद नौरट, राधाकृष्ण प्रकाशन, 1 वी. नेताजी सुभाष मार्ग, दरिया गंज, नई दिल्ली-110 002.

19. अनुवाद अवधारणा एवं विशेष – श्रीनारायण खंडीर - लोकभारती प्रकाशन, पहली मंजिल, महात्मा गाँधी मार्ग, सिविल लाइंस, इलाहाबाद, 211 001.

20. अनुवाद का व्याकरण – (सं) डॉ. सागी चौहान, डॉ. लोकनाथ तिवारी, भारतीय अनुवाद परिषद्, 24 स्कूल लेन, बेससेट, बंगाली मार्केट, नई दिल्ली-110 001.


22. अनुवाद प्रक्रिया एवं व्यवहारिकता – संतोष अनोखा, Authorspress, Q-2A Hauz Khas, New Delhi.

23. Approaches to translation : Peter New Mark, Shanghai Foreign Language Education press, 558 Dalian W. road, Luxun Gong Yuan, Hongkow Qu., Shanghai Shi, China.


Core 5 - पृष्ठोत्तर मूलक हिंदी -II (कामकाजी हिंदी और अनुवाद)

पाठ्य विषय

- प्रयोजनमूलक हिंदी का अभिप्राय
- कामकाजी हिंदी

पत्राचार : कार्यालयी पत्र, व्यावसायिक पत्र, व्यावहारिक पत्र, संक्षेपण, पत्रवर्ण, प्रारूपण, टिप्पण
भाषा कंप्यूटिंग : वर्ड प्रोसेसिंग, डाटा प्रोसेसिंग और पॉट प्रबंधन
अनुवाद : स्वरूप और प्रक्रिया, कार्यालयी अनुवाद, वैज्ञानिक अनुवाद, तकनीकी अनुवाद, वाणिज्यिक अनुवाद, विधिक अनुवाद, परिभाषित शब्दावली, बैटिंग, आश अनुवाद

अध्ययन के लिए सहायक पुस्तकें

- प्रयोजनमूलक हिंदी, विजयपाल सिंह, हिंदीबुक सेंटर, दिल्ली
- प्रयोजनमूलक हिंदी, सम्पा. रवीन्द्रनाथ थ्रीवास्तव, केन्द्रीय हिंदी संस्थान, आगरा
- प्रयोजनमूलक कामकाजी हिंदी डॉ. कैलाशचन्द्र भाटिया तथाशिला प्रकाशन, दिल्ली
- अनुवाद विज्ञान, भोलानाथ निबारी, शब्दाकार प्रकाशन, दिल्ली
- अनुवाद कला, डॉ. एन.ई. विब्धनाथ अव्वर, प्रभात प्रकाशन, दिल्ली
- अनुवाद समस्या एवं समाधान, डॉ. अरुण चण्ड्र, अभिमुक्त प्रकाशन रामबाण, कानपुर
- अनुवाद : कला सिद्धान्त और प्रयोग, डॉ. कैलाशचन्द्र भाटिया, तथाशिला प्रकाशन नई, दिल्ली
Core 6 - आधुनिक हिन्दी काव्य - I

पाठ्य विषय

'हिन्दी भारती' सम्पादक डॉ. शशिचंद्र निवारी, नेशनल प्रकाशित हाउस, 23, दरियागंज, नई दिल्ली (व्याख्या तथा आलोचनात्मक प्रश्नों के लिए निर्देशलिखित तीन कवियों एवं उनकी कविताओं का अध्ययन किया जायेगा)

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2. जगशंकर प्रसाद - 'तू बनकर प्राण समा जा रे', 'हिमाद्रि-तुंग श्रुंग से', अरुण यििििलहििििििििि', 'बढ़ा', 'शिखर पर'
3. सूर्यकांत त्रिपाठी निराला - 'बर दे दीणा वादिनी बर दे', 'जायो फिर एक बार', 'वह लोकती पत्थर', 'मानव जहाँ बैल-घोड़ा है', 'स्तंभ निकर बह गया है' इस पाठ हेतु निर्देशलिखित दो कवि जिनसे लघुत्तम प्रश्न पूछे जायेंगे

अध्ययन के लिए सहायक पुस्तकें

- आधुनिक हिन्दी कविता की प्रवृत्तियाँ - डॉ. नामक गाँगन सिंह, लोकभारती प्रकाशन, इलाहाबाद
- आधुनिक साहित्य की प्रवृत्तियाँ - डॉ. नंदेश्वर, नेशनल प्रकाशित हाउस, दिल्ली
- छायावाद के आधार स्वर्ण डॉ. गंगा प्रसाद, पाण्डेय लिपि प्रकाशन, नई दिल्ली
- हिन्दी के प्रतिनिधि कवि, डॉ. द्वारिका प्रसाद संके०, विनोद पुस्तक मन्दिर, आगरा
- आधुनिक कवि: निराला, रघुवंश, लोकभारती प्रकाशन, इलाहाबाद
- प्रसाद का काव्य, प्रेमशंकर, वाणी प्रकाशन, दिल्ली
- छायावाद की परमप्राक, श्याम किशोर मिश्र, लोकभारती प्रकाशन, इलाहाबाद
Core 7 - हिन्दी साहित्य का इतिहास - I (रीतिकाल तक)

पाठ्य विषय

- हिन्दी साहित्य का इतिहास: काल विभाजन, सीमानिधरण और नामकरण
- आदिकाल की पृष्ठभूमि, आदिकाल की विशेषतायें, प्रतिनिधि रचनाकार और उनकी रचनाएं
- पूर्वमध्यकाल (मधिकाल) की पृष्ठभूमि, भक्ति के उद्देश्य के कारण, भक्तिकाल की विभिन्न काव्यधाराएँ (सन्तकाव्यधारा, गृहीकाव्यधारा, रामकाव्यधारा, कृष्णकाव्य धारा) की विशेषतायें, प्रतिनिधि रचनाकार और उनकी रचनायें।
- उत्तरमध्यकाल (रीतिकाल) की ऐतिहासिक पृष्ठभूमि, नामकरण की समस्या, रीतिकालीन साहित्य की विभिन्न काव्यधाराओं (रीतिबद्ध, रीतिमित्र और रीतिकुंत) की विशेषतायें, प्रतिनिधि रचनाकार और उनकी रचनायें।

अध्ययन के लिए सहायक पुस्तकें

- हिन्दी साहित्य का मुख्य-इतिहास, बाबू गुलाबीय कालेन्द्र, अध्यात्म अकादमी, दिल्ली
- हिन्दी साहित्य का इतिहास, आचार्य रामचन्द्र शुक्ल, नागरी प्रचारणी समा, बाराणसी
- हिन्दी साहित्य उद्देश्य और विकास, आचार्य हजारीप्रसाद द्विवेदी, राजकमल प्रकाशन, दिल्ली
- हिन्दी साहित्य का इतिहास सम्पा. डॉ. नगेन्द्र, नेशनल पुस्तकियंग हाउस, दिल्ली
- हिन्दी साहित्य का वैज्ञानिक इतिहास, गणनमित्व चन्द्र गुस्सा, लोकभारती प्रकाशन, इलाहाबाद
- हिन्दी साहित्य का इतिहास, विजयनंद स्नातक, साहित्य अकादमी, दिल्ली
Core 8 (Supportive 2) – राजभाषापूर्णशिक्षण

पृष्ठावर्तना –
कार्यालय हिंदी का एक नया सूची इंडिया विश्वविद्यालय द्वारा विकसित हुआ है। इसका क्रयविवर्त न, पूरीत कर लेने पर रोजगार की संभावनाओं में अभिवृद्धि होगी और राजभाषा का स्वरूपांकन भी होगा।

पाठ्यविषय
• प्रशासन – भाषा और भाषा
• भारत की भूमिगतिका और एक संपर्क भाषा की अवस्थानता
• राजभाषा : कार्यालयी हिंदी के प्रवेश;

इकाई-2
• राजभाषा विषयक संविदाधिक प्रवास
• राजभाषा अधिनियम अनुसार 343 से 351 तक, राजपत्र से आदेश 1952, 1955, 1960 राजभाषा अधिनियम 1963 वथा संरचनासंरचना 1967, राजभाषा संरचना 1968 वथामोटिवित 1969, राजभाषा विवरण 1976, दिव्यांगी नीति और प्रवासी सुविधा। हिंदी के प्रवासी के प्रथम प्रवास में हिंदी की स्थिति। अंतरराष्ट्रीय स्तर पर हिंदी। हिंदी के प्रचार प्रसार में विभिन्न हिंदी संस्थाओं की भूमिका। हिंदी और देवनागरी लिपि के मानकीकरण की संभावना।
• राजभाषा का अनुप्रयोग पक्ष हिंदी अनुप्रयोग, दिव्यांगी, संरचनाओं तथा पत्रकार।
• कार्यालयी विश्वविद्यालय के हिंदी अनुसंधान की सम्पति।
• हिंदी कम्प्यूटरीकरण
• हिंदी में संवेदनशीलता और कुतूहल तित्तर।
• हिंदी में मैंनेक और तकनीकी परिसमाप्त शब्दावली।
• केंद्र एवं राज्य शासन के विभिन्न मनोरंजनों में हिंदी अनुप्रयोग की स्थिति।
• विकास के वेतन में हिंदी।
• वृथा प्राप्तिगत संसार माध्यमों के परिप्रेक्ष्य में हिंदी और देवनागरी लिपि।
• भूसंतानीकरण के परिप्रेक्ष्य में हिंदी का भविष्य।

संदर्भ ग्रंथ –
1. प्रयोजनमूलक हिंदी - डॉ. रामप्रकाश और दिवेश सुस।
2. प्राथमिक हिंदी - डॉ. रामप्रकाश और दिवेश सुस।
3. प्रयोजनमूलक हिंदी - डॉ. बिनोद गोलात।
4. हिंदी में नयांनता का महत्त्व।
5. कार्यालयी हिंदी – कार्यालयी इकाई।
6. हिंदी अनुप्रयोग और दिव्यांगी – प्रो. विराज।
7. अनुप्रयोग तथा - डॉ. विशालकार अय्यर, प्रभाष प्रकाशन, दिल्ली।
8. अनुप्रयोग कला संदेश और प्रयोग – कैल्शन विश्वविद्यालय, बुनारायण।
9. अनुप्रयोग तथा अनुप्रयोग - बुनारायण विश्वविद्यालय, हिंदी के प्रबोधक; दिल्ली।
10. अनुप्रयोग तथा अनुप्रयोग - बुनारायण विश्वविद्यालय, हिंदी के प्रबोधक; दिल्ली।
11. अनुप्रयोग तथा अनुप्रयोग - बुनारायण विश्वविद्यालय, हिंदी के प्रबोधक; दिल्ली।
12. अनुप्रयोग तथा अनुप्रयोग - बुनारायण विश्वविद्यालय, हिंदी के प्रबोधक; दिल्ली।
13. ज्ञानी भाषा विज्ञान – डॉ. मोहन नाम दिवेश सुस।
14. ज्ञानी भाषा विज्ञान – डॉ. मोहन नाम दिवेश सुस।
15. अनुप्रयोग तथा - डॉ. मोहन नाम दिवेश सुस।
16. अनुप्रयोग तथा आयाम – संपा. डॉ. श्रीमुनन राय, अनिल प्रकाशन, आलोचना कार्यक्रम, इलाहाबाद।
17. कम्प्यूटर के भाषाक्षेत्र प्रसारण - विज्ञानकार्यक्रम, महाचौहर।
18. कम्प्यूटर और हिंदी – हृदयोत्पन्न।
Core 9 आधुनिक हिन्दी काव्य - II

पाठ्य विषय

'हिन्दी भारती' समपा. डो. शस्त्रेश्वर तिवारी, नेशनल पत्रिका एजुकेशन हाउस 23 दरियागंज नई दिल्ली भारत तथा आलोचनात्मक प्रश्नों के लिए निष्प्रक्षित तीन कवियों एवं उनकी कविताओं का अध्ययन किया जाएगा।

1. रामधारी सिंह दिनकर - 'हिमालय के प्रति', 'बापू', 'चौंद और कवि', 'आशा की बंधी'
2. नागाजुन - 'वे और तुम', 'बहुत दिनों के बाद', 'कालिदास', 'अकाल और उसके बाद'
3. अजय - 'हमारा देश', 'नदी के द्वीप', 'यह दीप अकेला', 'पत्थर का पोड़ा', 'सागर मुद्रा'

हर पाठ इस प्रकार निष्प्रक्षित दो कवि जिनसे लघुत्तम प्रश्न पूछे जायेंगे
1. धर्मचीर भारती 2. धूमिल

अध्ययन के लिए सहायक पुस्तकें

- दिनकर, डो. साहित्री सियाल, राजपाल एण्ड संस, दिल्ली
- दिनकर:एक पुनरुत्थापन, डो. विजयन्द्रनारायण सिंह, परिप्रेय प्रकाशन, इलाहाबाद
- अजय और आधुनिक रचना की समस्या, रामस्वरूप ज्योति वंदेती, भारतीय जानपीठ प्रकाशन, दिल्ली
- कविता के नये प्रतिमान, नमबर सिंह, राजकमल प्रकाशन, दिल्ली
- धर्मचीर भारती की साहित्य साधना, पुप्पा भारती, भारतीय जानपीठ प्रकाशन, दिल्ली
- धूमिल की कविता यात्रा, मंजू अग्रवाल, प्रलम प्रकाशन, कानपुर
- नागाजुन-जीवन और साहित्य, प्रकाशचंद्र भट्ट सेवासम्मत प्रकाशन, मंदसोरा
Core 10 - हिन्दी साहित्य का इतिहास - II (आधुनिक काल)

पाठ्य विषय

• आधुनिक काल की सामाजिक, राजनैतिक पृष्ठभूमि
• भारतेन्दु युग, ब्रिटिश युग, आधुनिक शहर, प्रगतिवाद, प्रयोगवाद नयी कविता, समकालीन कविता की विशेषताएँ, प्रमुख साहित्यकार और रचनाएँ
• हिन्दी गद्य की प्रमुख विधाओं (कहानी, उपन्यास, एकांक, नाटक, निबंध, खेतीवाद, आलोचना संस्मरण, जीवनी, आत्मकथा, रिपोर्टेज) का उद्देश्य और विकास, प्रमुख साहित्यकार और रचनाएँ

विद्यायन के लिए सहायक पुस्तकें

• हिन्दी साहित्य का इतिहास, आचार्य रामचंद्र शुक्ल, नागरी प्रचारिणी सभा, बाराणसी
• हिन्दी साहित्य का इतिहास सम्पा. डॉ. नंदमंद्र, नेशनल पब्लिशिंग हाउस, दिल्ली
• आधुनिक हिन्दी साहित्य का इतिहास, विजयनराय लोकभारती प्रकाशन, इलाहाबाद
• हिन्दी साहित्य के वैज्ञानिक इतिहास, डॉ. गणपतिचंद्र गुरु, भारतेन्दु भवन, चंडीगढ़
• हिन्दी साहित्य का सुन्दर इतिहास, वांडवु मुलाराय, प्रकाशक जयमीनारायण लाल अग्रवाल, आगरा
• हिन्दी साहित्य और संवेदना का विकास, रामस्वरूप चतुर्वेदी, लोकभारती प्रकाशन, इलाहाबाद
• हिन्दी साहित्य: विधाएँ और विधाएँ, शशिभूषण सिंह, प्रवीण प्रकाशन, महरौली दिल्ली
पाठ्य विषय

- ‘काव्य संचयन’ सम्पा. डॉ. चमनलाल गुप्ता, वाणी प्रकाशन, नई दिल्ली
- व्याख्या एवं आलोचनात्मक प्रश्नों के लिए निःशंकित तीन कवियों का अध्ययन किया जायेगा।
  1. विद्यापति – पद संख्या 1,4,5,6,10
  2. कबीर – ज्ञान विरह को अंग, परत्व को अंग, सबद - 1 से 12 तक
  3. जायसी – बनिजारा बाण, कथा का आध्यात्मिक रूपक कवि की अल्पिम विद्या

दुतपाठ हेतु निःशंकित 4 कवियों जिनसे लघुत्तरी प्रश्न पूछे जायेंगे
  1. चंद बरदाई
  2. समीर खुसरो
  3. गुरु नानक देव
  4. रैदास

अध्ययन के लिए सहायक पुस्तकें

- कबीर, हजारीप्रसाद द्विवेदी, राजकमल प्रकाशन, नई दिल्ली
- सूरदास, ब्रजचंद्र वर्मा, हिन्दी माध्यम विश्वविद्यालय, प्रयाग
- गोस्वामी तुलसीदास, रामचन्द्रशुक्ल, नगरी प्रचारिणी सभा, काशी
- हिन्दी के प्राचीन प्रतिनिधि कवि, द्वारिकाप्रसाद समस्ता, बिनोदपुस्तक मन्दिर, आगरा
- प्राचीन हिन्दी काव्य - डॉ. ओमप्रकाश, राधाकृष्ण प्रकाशन, दिल्ली
Core 12 (Supportive 3) — कथाकार प्रेमचंद

पाठ्य विषय

- खण्ड : क.
  1. प्रेमचंद का व्यक्तित्व और कृतित्व, प्रेमचंद का जीवन दर्शन, प्रेमचंद का हिन्दी कथा साहित्य में पदार्पण, प्रेमचंद के कथा साहित्य का विकास, प्रेमचंद के साहित्य की विशेषताएँ और उपलब्धियाँ।

- खण्ड : ख व्याख्या एवं विवेचन के लिए निर्धारित उपन्यास और कहानियाँ

- उपन्यास
  1. सेवासदन
  2. प्रतिज्ञा
- कहानियाँ
  1. नमक का दारोगा
  2. बड़े घर की बेटी
  3. रामलीला
  4. आत्माराम
  5. ठाकुर का कुंआ
  6. दो बैलों की कथा
  7. पंचपिमेश्वर
  8. परीक्षा

(प्रेमचंद : प्रतिविधि कहानियाँ सम्पा, भीष्म साहनी, राजकमल प्रकाशन दिल्ली)

अध्ययन के लिए सहायक पुस्तकें

- प्रेमचंद विश्वविद्यालय (भाग 1 तथा भाग 2) कमलकिशोर धोयनका, प्रभात प्रकाशन दिल्ली
- प्रेमचंद और उनका युग, रामभंवा श्रमन, राजकमल प्रकाशन दिल्ली
- प्रेमचंद के उपन्यासों का शिल्प विचार, कमलकिशोर धोयनका, सरस्वती प्रेस दिल्ली
- प्रेमचंद का कथा संसार, समपा, नरेन्द्र मोहन, सरस्वती विहार शाहदरा दिल्ली
- कथाकार प्रेमचंद, रामदरश सिद्ध, नाशनल पब्लिशिंग हाउस दिल्ली
- प्रेमचंद के साहित्य सिद्धान्त, नरेन्द्र कोहली, अशोक प्रकाशन दिल्ली
- प्रेमचंद आज के सदर्म में, संग्राम प्रमद विभाग, राजकमल प्रकाशन दिल्ली
- कलम का दिलाशा, अमृत, हंस प्रकाशन इलाहाबाद
- प्रेमचंद : जीवन कला और कृतित्व, हरिराज रघुबर, साहित्य प्रकाशन शाहदरा दिल्ली
Core 13 - काव्यांग

पाठ्य विषय

• काव्य का स्वरूप, काव्य हेतु एवं प्रयोजन
• रस का स्वरूप, रस के विभिन्न अंग, रस का काव्य में महत्व, रस के विभिन्न भेद
• शब्दशस्त्र: अभिधा, लक्षण, क्योंजना
• अलंकार: अलंकार के लक्षण, अलंकार के भेद, अलंकार का काव्य में महत्व अनुभाष, यमक, द्वेष.
• वैशिष्ट्य, उपमा, रूपक व्यतीर्थ, उत्प्रेक्ष, अतिशयोक्ति, अन्योक्ति
• छन्द: छन्द के लक्षण, छन्द के भेद, छन्द के विभिन्न अंग, छन्द का काव्य में महत्व, दोहा, चौपाई, छप्पय, कुण्डलिया, रोला मालिनी, बसंततिलका, इन्द्रवज्रा, उपेन्द्रवज्रा, मतगंध मवैय। विम्ब, प्रतीक कल्पना एवं मिथक

अध्ययन के लिए सहायक पुस्तकें

• काव्यांग विवेक - देवेंद्र त्यागी, राधावृद्धण प्रकाशन, दिल्ली
• भारतीय काव्यशास्त्र के प्रतिमांत, हां. जगदीश प्रसाद कौशिक, साहित्यागार, जयपुर
• काव्यसिद्धांत - डॉ. ओमप्रकाश शास्त्री, आर्यवंश किपो करोलवाग, नई दिल्ली
• छन्दोद्योग प्रदीप - हां. संसारचन्द्र, उमेश प्रकाशन, नई दिल्ली
• काव्य के अंग - लक्षण दत्त गौतम, भारतपुस्तक भण्डार, दिल्ली
• भारतीय काव्य चिन्तन: शोभाकान्त मिश्र, अनुभ प्रकाशन, पटना
Core 14 - हिन्दी नाटक और एकांकी

पाठ्य विषय

- व्याख्या एवं विवेचन के लिए, निर्धारित नाटक एवं एकांकी
  i) नाटक - ‘ध्रुवस्वाहमनी’ - जयंक प्रसाद  
  ii) एकांकी 'स्मात एकांकी' - सम्पा. द्र. सूर्यप्रसाद दीक्षित, प्रका.- अमन प्रकाशन 104A/118 रामवाण, कानपुर - 12

1. कौमुदी महोत्सव - डॉ. रामकुमार वर्मा  
2. पतित - भुवनेश्वर  
3. सूखीकाली - उपेन्द्रनाथ अश्क  
4. सीमारेखा - विषु प्रसादकर  
5. बोर का तारा - जगदीश चन्द्र मायुर

अध्ययन के लिए सहायक पुस्तकें

- प्रसाद : नाटक और रंगशिल्प, डॉ. गोविन्द चातक, आत्माराम एण्ड संस, दिल्ली  
- प्रसाद के नाटक, डॉ. सिद्धनाथ कुमार, दि मैकमिलन कम्पनी ऑफ इण्डिया लि., दिल्ली
- हिन्दी साहित्य का बृहत्त इतिहास (एकादि भाग) डॉ. सावित्री सिन्हा, नागरी पुस्तकारणी सम्ब, वाराणसी  
- हिन्दी के प्रतिनिधि एकांकीकार, डॉ. द्वारिकाप्रसाद सक्षेत्र, अमन प्रकाशन, दिल्ली  
- हिन्दी एकांकी साहित्य - डॉ. सत्येन्द्र, साहित्यरत्न भण्डार, अगरारा  
- हिन्दी एकांकी की शिल्पविधि का विकास, डॉ. सिद्धनाथ कुमार इन्द्रप्रस्थ प्रकाशन, दिल्ली
Core 15 - हिन्दी भाषा

पाठ्य विषय

- हिन्दी भाषा का उद्गम और विकास
- प्राचीन भारतीय आर्थ भाषाएँ
- वैदिक तथा लौकिक संस्कृत और उनकी विशेषतायें
- मध्यकालीन भारतीय आर्थ भाषाएँ - पाली, प्राकृत और अपरंश तथा उनकी विशेषताएँ
- आधुनिक भारतीय आर्थ भाषाएँ और उनकी विशेषताएँ
- हिन्दी की उपभाषाएँ
- पद्माम हिन्दी, पूर्वी हिन्दी, राजस्थानी, पहाड़ी तथा विहारी और उनकी बोलियों का परिचय
- हिन्दी शब्द रचना : उपसर्ग, प्रत्यय, समास
- हिन्दी के विविध रूप : सम्पर्क भाषा, राष्ट्रभाषा और राजभाषा के रूप में हिन्दी। हिन्दी की सांविधानिक स्थिति, हिन्दी का अंतरराष्ट्रीय सन्दर्भ।
- देवनागरी लिपि : उद्गम और विकास, देवनागरी लिपि की वैज्ञानिकता, देवनागरी की वृत्तियाँ और सुधार

अध्ययन के लिए सहायक पुस्तकें

- हिन्दी भाषा का उद्गम और विकास, डॉ. उदयनारायण तिवारी, भारतीभण्डार, इलाहाबाद
- हिन्दी भाषा की संरचना, भोलानाथ तिवारी, राजकमल प्रकाशन, बाराणसी
- भारतीय आर्थापाएँ और हिन्दी, सूचित कुमार चटर्जी, राजकमल प्रकाशन, दिल्ली
- भाषा विज्ञान की भूमिका, देवनारायण शर्मा, राधाकृष्ण प्रकाशन, दिल्ली
- भाषा विज्ञान, भोलानाथ तिवारी, किताब महल, इलाहाबाद
- नगरी लिपि उद्गम और विकास, डॉ. ओमप्रकाश, आर्थिक डिपो, दिल्ली
- हिन्दी भाषा उद्गम और विकास, निभिल कुमार दुबे, जनाहर प्रकाशन, दिल्ली
Core 16 (Supportive 4) – हिंदी उपन्यास

पाठ्य विषय

खण्ड : क - उपन्यास की परिभाषा और स्वरूप, हिंदी उपन्यास का उद्भव और विकास, हिंदी उपन्यास की प्रमुख शैलियाँ, हिंदी के प्रतिनिधि उपन्यासकारों का वस्तुविश्लेषण वैश्विकता।

खण्ड : ख - व्याख्या एवं विवेचन के लिए निर्दिष्टि उपन्यास

1. कर्मभूमि - प्रेमजन्द्र
2. मृगनयनी - वुंदावनलाल वर्मा
3. सुनिता - जैनेन्द्र

ह्रदयाल हेतु निर्मित उत्तरोत्तर पाँच कवियों पर लघुत्तम/अति लघुत्तम प्रश्न पूछे जायेंगे

1. बाणभट्ट की आत्मकथा (हजारी प्रसाद द्विवेदी) 2. बलचनमा (नागाजुका)
3. वे दिन (निर्मल वर्मा), 4. आपका बंटी (मलु मण्डरी), 5. सूरज का सातवां घोड़ा (धर्मी भारती)

अध्ययन के लिए सहायक पुस्तकें

- हिंदी उपन्यास का इतिहास, गोपालराव, राजकमल प्रकाशन दिल्ली
- हिंदी उपन्यास, डॉ. सुरेश सिन्हा, लोकभारती प्रकाशन, इलाहाबाद
- हिंदी उपन्यास - डॉ. सुषमा धवन, राजकमल प्रकाशन दिल्ली
- प्रेमजन्द्र के उपन्यासों का शिल्प विद्यान, डॉ. कमल किशोर गोयनका, सरस्वती प्रेस, दिल्ली
- आधुनिक हिंदी उपन्यास, समय, भीष्म साहिनी, राजकमल प्रकाशन दिल्ली
- वुंदावनलाल वर्मा : उपन्यास और कला, शिवकुमार मिथु, किताबघर कानपुर
- जैनेन्द्र और उनके उपन्यास - परमानंद दी वास्तव, मैकमिलन प्रकाशन, दिल्ली
- हिंदी उपन्यास की प्रवृत्तियाँ, शशिभूषण सिंहल, बिनोद पुस्तक मन्दिर आपरा
Core 17 - निबन्ध और रचना

पाठ्य विषय

- निबन्ध लेखन
  i) साहित्यिक निबन्ध
  ii) सामान्य निबन्ध
- सार लेखन (Precise Writing)
- कथा विस्तार (Story Elaboration)
  (संकेत विन्दुओं पर आधारित किसी कथा का विस्तार करना होगा)
- पाठ बोधन (Comprehension)
  1. अपठित गद्यांश
  2. अपठित काव्यांश
  (अपठित गद्यांश एवं काव्यांश दोनों में से शीर्षक का चुनाव, विषयवस्तु का बोध, भाषिक विन्दुओं विशेषताओं आदि पर 5-5 अतिलघुत्तिी प्रश्न पूछे जायेंगे)

अध्ययन के लिए सहायक पुस्तकें

- निबन्ध सौरभ, तनमुखराम गुप्त, सूर्य भारती प्रकाशन, नई सड़क, दिल्ली 6
- निबन्ध सम्पाद, श्रीरंजन शास्त्री नामक प्रकाशन मौजपुर, दिल्ली 53
- साहित्यिक निबन्ध, राजनाथ शर्मा, विनोद पुस्तक मंदिर, आगरा
- साहित्यिक निबन्ध, रमेशचन्द्र शर्मा, ओमन प्रकाशन, राजवाणी, कनकपुर
- व्यावहारिक हिंदी और रचना, कृष्ण कुमार गोस्वामी, डी.वि. इंटरनेशनल प्रकाशन दिल्ली
- हिंदी संक्षेपण, पन्नवन और पाठबोधन, डॉ. हरदेव बाहरी, ज्ञान भारती पुराना कटरा, इलाहाबाद
Core 18 - पुरातन हिंदी काव्य -II

पाठ्य विषय
‘काव्य संचयन’ सम्पादक – डॉ. चमन लाल गुप्ता, वाणी प्रकाशन, नई दिल्ली

1. सुरदास – विनय तथा भक्ति
2. तुलसीदास – बर्षा वर्षा, अजेयरथ, विनय पतिका, कवितावली
3. विहारी – भक्तिमायना – 1 से 20 दोहे, पंगार 41 से 56 दोहे, प्रकृति – 57 से 59 दोहे

द्रुतपाठ हेतु निम्नलिखित चार कवियों से लघुनरी प्रथ पुछे जायेंगे
1. मीरावाई 2. पद्माकर 3. धनानन्द 4. भूषण

अध्ययन के लिए सहायक पुस्तकें

- हिंदी के प्राचीन प्रतिनिधि कवि द्वारिका प्रसाद सक्सेना, मैकमिलन कम्पनी ऑफ इंडिया लि., दिल्ली
- प्राचीन हिन्दी काव्य - डॉ. ओमप्रकाश, राधाकृष्ण प्रकाशन, दिल्ली
- रीतिकाव्य की भूमिका - डॉ. नगेन्द्र, नेशनल पब्लिशिंग हाउस, दिल्ली
- विहारी काव्य का नया मूल्यांकन - डॉ. बबुन सिंह, हिन्दी प्रचारक संस्थान, वाराणसी
- देघ और विहारी, कृत्वीरिहारी मिश्र, गंगा पुस्तक माला कार्यालय, लखनऊ
- धनानन्द का काव्य, रामदेव श्रुत्र, मैकमिलन कम्पनी ऑफ इंडिया लि., दिल्ली
Core 19 - साहित्य: स्वूपि और विद्याएँ

पाठ्य विषय

(क) साहित्य का अर्थ, परिभाषा, साहित्य के तत्व
   साहित्य और समाज

(ख) साहित्य की विविध विधाएँ : परिभाषा, तत्व, स्वरूप तथा प्रकार
   दृश्यकला - नाटक, एकांकी
   श्रव्यकला - पद्य, गद्य और चम्पू
   पद्य - प्रबन्धकाव्य, मुककाव्य
   गद्य - उपन्यास, कहानी, निबन्ध, आलोचना, जीवनी,
   रेखाचित्र, आत्मकथा, संस्मरण, यात्रावृत्ती, रिपोर्टेज, डायरी

अध्ययन के लिए सहायक पुस्तकें

- काव्य के रूप, गुलाबराय, आत्माराम एण्ड संस काशीरी नेट दिल्ली
- साहित्य रूप, रामधर द्विवेदी, भारती भंडार, इलाहाबाद
- साहित्य तथा उसकी विविध विधाएँ, तारीखी चर्चादास निधानन्द, हिन्दी बुक सेंटर, दिल्ली
- हिन्दी साहित्य : विधाएँ और विधाएँ, अशोकमूर्ण सिंहळ, प्रसीद्ध प्रकाशन महोत्ती, नई दिल्ली
- हिन्दी साहित्य, भोजनाथ तिवारी, हिन्दी परिषद, प्रकाशन, प्रयाग
- आधुनिक गद्य की विविध विधाएँ, उदय भानु सिंह, वाणी प्रकाशन, दिल्ली
- साहित्यिक विधाएँ : पुनर्विचार, हरिमोहन, वाणी प्रकाशन, दिल्ली
- साहित्य में गद्य की नई विविध विधाएँ, कैलाशचन्द्र भाटिया, तथाशिला प्रकाशन, दिल्ली
- हिन्दी गद्य प्रकृति और रचना सन्दर्भ, रामचन्द्र तिवारी, विश्वविद्यालय प्रकाशन, वाराणसी
Core 20 - निबंध तथा अन्य गद्य विषयाएँ

पाठ्य विषय

‘निबंधायन’ सम्पा. डॉ. केशवदत्त श्यामली प्रका. विनोद पुस्तक मन्दिर राणध राघव मार्ग, आगरा - 2

1. आत्मगौर - वालकुण्ड महा
2. लज्जा और ग्लास - रामचन्द्र शुक्ल
3. कुटज - हृदयारी प्रसाद द्विवेदी
4. नीलकंठ - हरिशंकर परसाई
5. वेतवा के तीर पर - विचारविवास मिश्र

दूसरे पाठ के लिए निम्नलिखित तीन गद्यकार जिनसे लघुत्तम प्रश्न पूछे जायेंगे

1. सरदार पूर्ण सिंह (मजदूरी और प्रेम)
2. राहुल सांकृत्यायन (स्थानों यथाक्रम जिज्ञासा)
3. महादेवी वर्मा (सीना)

अध्ययन के लिए सहायक पुस्तकें

- हिन्दी साहित्य का वृहत इतिहास (ज्योध काल) सम्पा. लक्ष्मीनारायण संग्रहालय, नागरी प्रसारणी संस्था, वाराणसी
- प्रतिनिधि हिन्दी निबंधकार, हरिमोहन, तथाचिना प्रकाशन, दिल्ली
- हिन्दी निबंध का विकास, डॉ. ओमकारनाथ शर्मा, अनुराधाप्रक्षाशन, नागपुर
- हिन्दी वाङ्मय बीसवीं शती सम्पा. डॉ. ब्रह्मचारी विनोद पुस्तक मंदिर, आगरा
भाषा की परिभाषा, भाषा की विशेषताएं और भाषा के विभिन्न रूप
• भाषा उत्पत्ति के सिद्धांत
• भाषा विज्ञान : रूप शब्दाओं और उपयोगिता
रूप - एकाकालिक, ऐतिहासिक, तुलनात्मक और प्रायोगिक
शाखाएँ - वाक्यविज्ञान, रूपविज्ञान, शब्दविज्ञान, ध्वनि-विज्ञान और अर्थविज्ञान
• स्वर विज्ञान : स्वर की अवधारणा, स्वरवंश और उनके कार्य, स्वरों का वर्गीकरण, स्वरित विज्ञान का स्वरूप, स्वर परिवर्तन के कारण
• रूपविज्ञान रूप या पद बनाने की प्रक्रिया, शब्द और रूप का भेद, रूपित या रूपग्राम के भेद
• वाक्य विज्ञान : वाक्य की अवधारणा और वाक्य के भेद -अर्थ की दृष्टि से और रचना की दृष्टि से
• अर्थ विज्ञान , अर्थ की अवधारणा, अर्थ परिवर्तन के कारण और दिशाएँ - अर्थविस्तार, अर्थसंकोच, अर्थविश्लेषण, अर्थार्थ, अर्थार्थरूप

अध्ययन के लिए सहायक पुस्तकें
• भाषा विज्ञान, भोलानाथ तिब्बती, किताब महल, इलाहाबाद
• सामान्य भाषा विज्ञान, बाबूराम सरस्वती, हिन्दी साहित्य सम्मेलन, इलाहाबाद
• भाषा विज्ञान की मूर्तिका, देवनारायण शर्मा, गांधी कृपामण्डल प्रकाशन दिल्ली
• भाषा विज्ञान के सिद्धांत और हिन्दी भाषा, डॉ. द्वारिका प्रसाद सरस्वती, मीनाक्षी प्रकाशन, दिल्ली
• भाषा विज्ञान कोश-भोलानाथ तिब्बती, ज्ञानमण्डल प्रकाशन, दिल्ली
Core 22 - भारतीय साहित्य

पाठ्य विषय

खण्ड ख: - भारतीय साहित्य का स्वरूप

1. भारतीय साहित्य की मूलभूत एकता
2. भारतीय साहित्य के अध्ययन की समस्यायें
3. भारतीय साहित्य में भारतीयता
4. भारतीय साहित्य में आज के भारत का विचार
5. भारतीय साहित्य का समाजशास्त्र
6. हिन्दी साहित्य में भारतीय मूल्यों की अभिव्यक्ति

खण्ड ख: - एक उपन्यास, तथा दो कहानियों का अध्ययन मात्रा लघूत्तिी/अति लघूत्तिी प्रश्न हेतु

1. उपन्यास (मलयालम)
   ‘मछुआिे’ - तकरीबी शिवशंकर पिल्ले अनुवादक भारती विद्यार्थी साहित्य अकादमी, नई दिल्ली

2. कहानियाँ (बंगला)
   काबुलीवाला - रवीन्द्रनाथ ठाकुर, अभागीस्वंग - शरतचंद्र

3. कविता (उड़िया)
   वर्णों की मुख्य – सीताकंत महापात्र, नारी, हम, वचनहरण, किस आदमी गुण से , पृथ्वी

अंकविभाजन: पूणांक 100

8 में से 4 आलोचनात्मक प्रश्न 4 x 15 = 60 अंक
8 में से 4 लघूत्तिी प्रश्न 5 x 4 = 20 अंक
20 वस्तुहन/अति लघूत्तिी प्रश्न 20 x 1 = 20 अंक

उपयोग के लिए सहायक पुस्तकें:

- भारतीय साहित्य सम्पा. डॉ. नंदेन्द्र, प्रभात प्रकाशन दिल्ली
- भारतीय साहित्य दर्शन, डॉ. कुश्मान्त हंज, प्रन्थम प्रकाशन, रामबाण कानपुर
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- भारतीय भाषाओं के साहित्य का इतिहास, सम्पा. वेंद्रीय हिन्दी निदेशक, शिक्षा तथा - समाज कल्याण मंत्रालय भारत सरकार, नई दिल्ली
- भारतीय भाषाओं के साहित्य का रूप दर्शन, गौरीशंकर पंडेय, इल्पप्रसंस्कृत
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- भारतीय साहित्य, ब्रजकिशोर प्रसादसिंह, अमन प्रकाशन, रामबाण कानपुर
- शरतचंद्र: व्यक्तित्व और साहित्यकार, सम्मथनाथ गुप्त, नेशनल प्रकाशिंग हाउस, दिल्ली
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- सती तथा अन्य कहानियों, भारत जानविज्ञान प्रकाशन, दिल्ली – 32
PART VI

EDUCATION COMPONENT
### FOUR YEAR INTEGRATED B.Sc., B.Ed. / B.A., B.Ed. COURSE

#### PART IV : EDUCATIONAL COMPONENTS

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| First    |      | **Field**
|          |      | Yoga, Health & Physical Education           | 50  | -- | 50    |
| Second   |      | **C&PS**
|          |      | Language across Curriculum                  | 30  | 70 | 100   |
|          |      | **EPC 1**
|          |      | Reading and Reflecting on Texts             | 50  | -- | 50    |
| Third    |      | **PE**
|          |      | Childhood and Growing Up I                  | 30  | 70 | 100   |
|          |      | **C & PS**
|          |      | Knowledge and Curriculum                    | 30  | 70 | 100   |
|          |      | **EPC 2**
|          |      | Drama and Art in Education                  | 50  | -- | 50    |
| Fourth   |      | **PE**
|          |      | Childhood and Growing Up II                 | 30  | 70 | 100   |
|          |      | **PE**
|          |      | Gender, School and Society                  | 30  | 70 | 100   |
|          |      | **EPC 3**
|          |      | Critical Understanding of ICT               | 50  | -- | 50    |
| Fifth    |      | **PE**
|          |      | Contemporary India and Education I          | 30  | 70 | 100   |
|          |      | **PE**
|          |      | Learning and Teaching I                    | 30  | 70 | 100   |
|          |      | **C & PS**
|          |      | Pedagogy of School Subject I -1             | 30  | 70 | 100   |
|          |      | **C & PS**
|          |      | Pedagogy of School Subject II -1            | 30  | 70 | 100   |
|          |      | **Practicum**
|          |      | School Internship                          | 100 | -- | 100   |
|          |      | **Practicum**
|          |      | Community Living Camp                      | 50  | -- | 50    |
|          |      | **EPC 4**
|          |      | Soft skills                                | 50  | -- | 50    |
| Sixth    |      | **PE**
|          |      | Learning and Teaching – II                 | 30  | 70 | 100   |
|          |      | **PE**
|          |      | Contemporary India and Education -II        | 30  | 70 | 100   |
|          |      | **PE**
|          |      | School Management – I                      | 30  | 70 | 100   |
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|          |      | Pedagogy of School Subject I -2             | 30  | 70 | 100   |
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|          |      | Pedagogy of School Subject II -2            | 30  | 70 | 100   |
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|          |      | Creating an Inclusive School                | 30  | 70 | 100   |
|          |      | **PE**
|          |      | School Management – II                     | 30  | 70 | 100   |
|          |      | **C&PS**
|          |      | Assessment for learning – I                | 30  | 70 | 100   |
|          |      | **C&PS**
|          |      | Pedagogy of School Subject I -3             | 30  | 70 | 100   |
|          |      | **C&PS**
|          |      | Pedagogy of School Subject II -3            | 30  | 70 | 100   |
|          |      | **Field**
|          |      | Yoga, Health and Physical Edn II            | 50  | -- | 50    |
|          |      | **EPC 5**
|          |      | Understanding Self                          | 50  | -- | 50    |
| Seventh  |      | **C&PS**
|          |      | Pedagogy of School Subject I - 4            | 30  | 70 | 100   |
|          |      | **C&PS**
|          |      | Pedagogy of School Subject II - 4           | 30  | 70 | 100   |
|          |      | **C&PS**
|          |      | Assessment for learning – II               | 30  | 70 | 100   |
|          |      | **Practicum**
|          |      | Pedagogy of School Subject I -Prac          | 100 | 100| 200   |
|          |      | **Practicum**
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FIRST YEAR - SEMESTER I

Edn: EPC 1- YOGA, HEALTH AND PHYSICAL EDUCATION -I

Practicum

Essence of the course:

Sound Body with a sound mind has always been the concern of India. With the changing conditions there are many health hazards. All of us need to learn how to observe sound health. This course offers the opportunity to learn the yoga and produce the health. It also deals with good food habit, nutrition, physical exercise and sports.

Objectives:

At the end of the course, the student teacher will be able to

- acquire the knowledge of Yoga, exercise, health & fitness
- understand the nature and structure of human bodies, injuries during emergencies and to provide first aid.
- apply discipline, rules and regulations to organize sports and games in schools.
- develop skills in organizing the physical education, health and yoga programmes in schools.
- develop interest in yoga, physical and health education,
- develop positive attitude towards the participation in yoga and health activities.

CONTENT OUTLINE

Unit 1: Yoga and Health


Unit 2: Health education


Unit 3: First Aid- Principles and Uses

First Year

Semester 1

Unit 4: Food and safety

Unit 5: Physical exercise and sports
concept and objectives of physical education, physical fitness, strength, endurance and flexibility, its components, sports skills, indigenous and self-defense activities – games & sports – athletes – general physical fitness exercises – games – (lead-up Games, relays and major games) rhythmic activity, gymnastics and their impact on health.

Mode of Transaction
Lecture, workshop, discussion, field visit, play ground work, demonstration, practice.

Practicum: Task and Assignment
1. Prepare month wise self-reports based on the development of your physical fitness – height, weight-Strength, speed, endurance, flexibility and body composition.(Walking, Running, Throwing and Jumping etc.)
2. Prepare a record for yoga learning and performing basic yogic activities along with your reflection and your yoga practice photographs.
3. Write a report based on visit and interview with the personals in yoga and health centres.
4. Prepare an album for yoga, health and physical education (minimum 10 pictures in each aspect).
5. Demonstration of Yogic exercises.
6. Make a portfolio of various Games for school children and their advantages.
7. Preparation of inventories on myths on exercises and different type of food
8. Make an inventory of energy rich food and nutritious food(locally available) indicating its health value
9. Make an inventory of artificial food and provide critical observations from health point of view
10. Prepare inventory of Medicinal plants and their medicinal values.
11. Select yoga practices for persons of average health for practical yoga sessions: Supine position, Prone position, Sitting position, Standing position, Kriyas, Mudras, Pranayamas

Mode of Assessment:
Yoga practice, filed visit report, written test and presentation

References:
3. Raja Yoga – Methods and practices – Dalmite
9. Physical Education Lessons: Dr. J. P. Thomas
18. www.FalunDafa.org
AECC: A1: ENVIRONMENTAL STUDIES

Theory

Essence of the course:
This course enables the teachers to develop knowledge about the environment and make them to understand and cope with nature which very essential for human beings. Keep in this in mind, it helps the student teacher to use the various resources for sustainability. It also intends them to develop interest towards the ecosystem and conservation of biodiversity. It would help them to find the solution for reducing various kinds of pollution and make them to involve towards environment and various issues.

OBJECTIVES:
At the end of the course, the student teacher will be able to

- know about the environment
- understand the surrounding
- know about biotic interaction.
- develop concern towards protecting the various resources
- plan and organise in ecological activities
- sensitize the cause and effects of various pollution
- develops positive attitudes to minimize solid wastes
- practice environmental friendly life style

Unit 1: Introduction to environmental studies
- Multidisciplinary nature of environmental studies;
- Scope and importance; Concept of sustainability and sustainable development.

Unit 2: Ecosystems
- What is an ecosystem? Structure and function of ecosystem; Energy flow in an ecosystem: food chains, food webs and ecological succession. Case studies of the following ecosystems:
  a) Forest ecosystem
  b) Grassland ecosystem
  c) Desert ecosystem
  d) Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)

Unit 3: Natural Resources: Renewable and Non-renewable Resources
- Land resources and land use change; Land degradation, soil erosion and desertification.
- Deforestation: Causes and impacts due to mining, dam building on environment, forests, biodiversity and tribal populations.
- Water: Use and over-exploitation of surface and ground water, floods, droughts, conflicts over water (international & inter-state).
- Energy resources: Renewable and non-renewable energy sources, use of alternate energy sources, growing energy needs, case studies.

Unit 4: Biodiversity and Conservation
- Levels of biological diversity: genetic, species and ecosystem diversity; Biogeographic zones of India;
- Biodiversity patterns and global biodiversity hot spots
- India as a mega-biodiversity nation; Endangered and endemic species of India
• Threats to biodiversity: Habitat loss, poaching of wildlife, man-wildlife conflicts, biological invasions; Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.
• Ecosystem and biodiversity services: Ecological, economic, social, ethical, aesthetic and Informational value.

Unit 5: Environmental Pollution
• Environmental pollution: types, causes, effects and controls; Air, water, soil and noise pollution
• Nuclear hazards and human health risks
• Solid waste management: Control measures of urban and industrial waste.
• Pollution case studies.

Unit 6: Environmental Policies & Practices
• Climate change, global warming, ozone layer depletion, acid rain and impacts on human communities and agriculture
• Nature reserves, tribal populations and rights, and human wildlife conflicts in Indian context.

Unit 7: Human Communities and the Environment
• Human population growth: Impacts on environment, human health and welfare.
• Resettlement and rehabilitation of project affected persons; case studies.
• Disaster management: floods, earthquake, cyclones and landslides.
• Environmental movements: Chipko, Silent valley, Bishnois of Rajasthan.
• Environmental ethics: Role of Indian and other religions and cultures in environmental conservation.
• Environmental communication and public awareness, case studies (e.g., CNG vehicles in Delhi).

Practicum: Task and Assignment
1. Visit to an area to document environmental assets: river/ forest/ flora/fauna, etc.
2. Visit to a local polluted site—Urban/Rural/Industrial/Agricultural.
3. Study of common plants, insects, birds and basic principles of identification.
4. Study of simple ecosystems—pond, river,
5. Visit to a local area to document environment assets—river/ forest/ grassland /hill/ mountain
6. Visit to a local polluted site—Urban/ Rural/ Industrial/ Agricultural- analyze and report
7. Study of simple ecosystems—pond, river, hill slopes, etc.
8. Preparation of a scrap book based on environmental issues from collection of articles and daily newspaper.
9. Prepare a list of Eco friendly, bio-degradable products and write its advantages.
10. Write a report on depletion of ozone layer, Acid rain, and acts related to conservation of environment.
11. Write a report on environmental issues and role of any agencies in protecting that issues.
12. Arrange a programme for environmental awareness and write a reflective report.

Mode of Assessment
Written test, Task and Assignment, Field visit
References:

First Year

FIRST YEAR - SEMESTER II

Edn 1: C&PS - LANGUAGE ACROSS THE CURRICULUM

Theory

Essence of the course:
This course is for the development of linguistic and communicative competencies of student teachers in a multicultural and multilingual environment. It is designed by keeping in mind that the language is an integral part of subject learning and competence which will have an impact on classroom interaction. It emphasizes on how language skills like listening, speaking, reading and writing play an important role in various subjects across the curriculum.

Objectives:
At the end of the course the student teachers will be able to

- acquire knowledge about language and literacy and principles of language teaching.
- understand the importance of language and literacy background of the learners with reference to spelling and vocabulary development
- apply the acquired knowledge in methods and approaches of teaching language.
- develop skills in reading and writing which pave the way to attain optimal learning of the subject areas.
- develop interest towards language learning from language diversity and multilingualism point of view.
- develop a positive attitude towards language to realise that learning and teaching cannot take place in a language free environment.

CONTENT OUTLINE

Unit 1: Nature and Functions of Language

Unit 2: Language Diversity in Classrooms
First Language and Second Language Acquisition – using of First and Second Language in the classroom – multilingualism in the class – meaning and concept- dialects – understanding language diversity of students – home language and school language

Unit 3: Methods of learning language in school subject areas
Methods: definition, types, traditional and modern methods – bilingual method – classroom discourse to oral language – questioning – methods for reading comprehension in specific subject areas – methods for writing in specific subject area – spelling methods, in learning to spell words correctly, philosophy of teaching of spelling, computer use and spelling vocabulary: definition, developing vocabularies, vocabulary acquisition and application.
Unit 4: Fluency in the Language
Communication – meaning and concept – process of communication – types of communication – nonverbal communication – functions and types.

Unit 5: Language assessment in school subjects
Assessment: definition, types, principles and classroom practice – tools: quizzes, projects, test – current reviews and practices – testing auditory comprehension – test the four skills – use of language lab and electronic devices for testing.

Mode of transaction:
Dialogue, seminars, discussions, group-work, language games, exercises and assignments

Practicum: Task and Assignment
1. Get a two-page writing from the school students in English and Mother tongue learning and analyse them from language point of view
2. Observe any five classes of subject teaching and analyse from the point of language teaching
3. Write a critical report on the opinion of subject teacher on the weightage for language aspects in valuation of subject test papers.
4. School visit to find out communication problem / Apprehension in students
5. Designing games and exercises for developing Listening, Speaking, Reading and Writing Skills
6. Assignments on Developing speaking skills – oral presentations, debate, elocution, discussion, brain-storming
7. Assignments on developing listening skills – listening to speech, directions

Mode of assessment: Written test and Task and assignment

References:
Edn: EPC 2 - READING AND REFLECTING ON TEXTS

Theory

Essence of the course:
The course is designed to enhance the reading capacity of the student teachers. It will enable them to develop meta-cognitive awareness. The course offers opportunities to student teachers to read a variety of texts and respond to it creatively and critically.

Objectives:
At the end of the course, 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

CONTENT OUTLINE

Unit 1: Introduction to Reading
Reading – Meaning and Process – Importance of Reading across Curriculum – Characteristics of Reading.

Unit 2: Reading Skills
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 3: Reading the Text
Types of Texts – Narrative, expository, descriptive, suggestive, empirical, conceptual, ethnography, policy documents, field notes – Importance of Different Texts in Curriculum

Unit 4: Developing Reading Skills
Developing Critical Reading Skills – Developing Reflective Skills – Activities for Developing Reading Skills – Developing Metacognition for Reading

Unit 5: Reading Comprehension
Developing Reading Comprehension – Developing Vocabulary for Reading – Problems of Reading

Mode of Transaction
Lecture, Discussion, Exercises, Games

Practicum: task and assignment
1. 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
2. Divide the group and provide one text and suggest students to make different interpretations
3. Design vocabulary games to enhance your vocabulary
4. Read the text and provide a five words summary to each paragraph
5. Reading and comprehension exercises
6. Skim through the text and give suitable title to the text
7. Complete given text in stipulated time and summarize it in 6/7 lines with a suitable title.
8. Individual reading and writing reflective report (5 books)
9. Presentation of reflective report for class review and modification of the report
10. Group reading and writing reflective group report (5 documents)
11. Constructive and creative presentation of ideas and pictures like poster on any one of the idea

**Mode of Assessment:**
Written test, Tasks and assignments

**References:**
14. Recognizing Different Types of Text
   http://www.bbc.co.uk/skillswise/factsheet/en03text-11-f-different-types-of-text
15. 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
16. Reflective Skills
   http://www.skillsyouneed.com/ips/reflecting.html
Essence of the course:

This course makes student-teacher to understand the systematic study of childhood, adolescence and their development, make them to learn children at different ages through theoretical and interaction with learners in school. The main focus of this course is to prepare student-teachers to accept different constructivist nature of different children which is influenced by their family, school, neighbourhood and community background in particular and political, social, and cultural dimension in general. It gives them knowledge about various theories of child development.

Objectives:
At the end of the course the student teachers will be able to
- acquire the knowledge of Childhood, Adolescence and their development
- to understand the Multiple childhood and developmental feature of childhood and adolescence under different socio-economic and cultural factors
- apply the theory of development to understand learners
- develop skill in measuring behaviour of childhood and adolescence
- understand about the various socio-cultural impact on learners

CONTENT OUTLINE

Unit 1: Childhood, Adolescence and their development
Meaning of Childhood, Adolescence and Their Development – distinguish between growth and development - characteristics of growth and development – principles of development – developmental feature (physical, mental, emotional, social, and moral)

Unit 2: Psycho-Social Perspective of Childhood & Adolescence
Childhood in different stages (Multiple Childhood) – Mental health of childhood & adolescence - period of high protection & struggle of childhood and adolescence (social, cultural and economic background) – present scenario of childhood and adolescence in India.

Unit 3: Status of Childhood & Adolescence
Nature of childhood and adolescence in different cultures – peak in development (Motor, Speech, Play, Creativity, Interest, Leadership, Group Behavior) – gender bias – sex role stereotypes, status of girl child (especially in under privilege) – exploitation of child in urban slum.

Unit 4: Theories of development
Social developmental – Urie Bronfenbrenner’s Ecological system theory, Vygotsky’s Social Development and Erikson Psycho social development theories - Mental development– Piaget’s cognitive development, Bruner’s concept formation, Gardner’s multiple intelligence theory - Emotional development - John Bowlby’s attachment theory

Unit 5: Heterogeneous nature of adolescence
Transitional stage – critical age – characters of adolescence – dissimilarity of adolescence – population levels, group levels, cultural difference, and individual difference – developmental task is determinants of socio-economic & cultural factors.

Modes of Transaction:
Lecture, Assignment, Seminar, Group discussion, Workshop, Film Show, Audio – Video

Practicum: Task and Assignment
1. To prepare study report on the development of (Physical, Social, Emotional, Mental) of urban and rural adolescence in a specific standard (from VIII to XII)
2. Give your view about the present scenario of childhood and Adolescence
3. Prepare an interview schedule based on the Social development indicators of adolescence and study the social development of the class students
4. Write auto-biography about once your childhood and adolescence period discuss with his/her peer.

Modes of Assessment:
Written test, seminar, presentation, Field Visit

References:
Edn 3: C&PS - KNOWLEDGE AND CURRICULUM

Essence of the course:
In the 21st century knowledge society, knowledge explosion is compelling the educational administrators to enrich the curriculum to develop the human resources according to the requirements of the world community. Therefore, this course is focusing on the knowledge and curriculum aspects. The purpose of knowledge and curriculum is to be understood from the epistemological and sociological perspectives of education. The course can enable the student teachers to gain confidence in curriculum design and evaluation by focusing the future directions.

Objectives:
At the end of the course the student teachers will be able to
• acquire knowledge of terms and concepts of curriculum and epistemology used in the field of education.
• understand the types and process of curriculum, importance of social and epistemological basis of education
• apply the appropriate strategies for curriculum transaction and curriculum development
• develop the skills to use the concepts, practices and roles play in curriculum evaluation with the aims of education
• develop the skills on critically analysis of various samples of textbooks, children’s literature, and teachers’ handbooks
• develop interest on go through discovery of various philosophers
• develop the attitude towards concepts of nationalism, universalism and secularism and their interrelationship with education

CONTENT OUTLINE

Unit 1: Knowledge and Curriculum

Unit 2: Principles of Curriculum
Aims, goals and objectives of curriculum – curriculum design and its components – curriculum development: technical-scientific approach and Nontechnical- Nonscientific approach – curriculum implementation and its models - Differentiating curriculum framework, curriculum and syllabus; their significance in school education

Unit 3: Curriculum Transaction
Strategies for curriculum transaction – Selection and organisation of learning situations – models of teaching: individual and team teaching, distance learning modes – Activity Based
Learning (ABL)- Activity Learning Methodology (ALM)- resources for curriculum transaction – computer and internet – role and importance.

Unit 4: Curriculum evaluation

Stages of programme evaluation - The curriculum cycle - nature and purpose of evaluation – approaches of evaluation – validity and significance of course content- evaluation models Taylor’s, Stane’s and CIPP model - practices and roles play in evaluation – peer evaluation - goal free evaluation – critical analysis of textbooks, children’s literature and teachers’ handbooks

Unit 5: Issues in Curriculum Development

Critical issues: teacher centred to learner centred, subject centred to practical knowledge – Environmental concerns, gender differences, inclusiveness, value concerns and issues, social sensitivity- centralized Vs decentralized curriculum – diversity among teachers in their competence - problem of curriculum load as many concerns are to be included in curriculum – participants in curriculum Development – role of state in the curriculum development – makers of curriculum – role of curriculum in national development – Curriculum makes an intellectual society – curriculum for 21st century – UNESCO’s concept of four pillars of education

Mode of transaction:
Group discussion, lecture, discussion, symposium, Peer group, Debates, Workshop, Seminar, Project work

Practicum: Task and Assignment
1. Select a primary school, observe and report about the implementation of ABL method.
2. Search in the internet about ALM method, and prepare an interview tool and interview 10 teachers who are using ALM method.
3. Write a comparative report based on the curriculum development in India and any other countries by referring internet.
4. Design a syllabi for a course at B.Ed, level /school level.
5. Write a report based on the curriculum of CBSE and Samacheer.

Mode of assessment:
Written test, Task and assignment

References:
Edn: EPC 3 - DRAMA AND ART IN EDUCATION

Practicum

Essence of the course:
This course is designed to enhance the creativity of student teachers and sharpen their aesthetic sensibilities. It aims to make student teacher aware of the role of art, music and drama in education. It will enable the student teacher to use the various forms of drama, art and music in the teaching learning to improve learning.

Objectives:
At the end of the course, 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.

CONTENT OUTLINE

Unit 1: Drama and its Fundamentals
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 2: Music (Gayan and Vadan)

Unit 3: The Art of Dance
Various Dance Forms - Bharat Natyam, Kathakali, Folk dance: Garba, Bhavai, Bhangada, Bihu and various other dances – Integration of Dance in educational practices (Action songs, Nritya Natika)

Unit 4: Drawing and Painting
Unit 5: Creative Art
Creative writing - Story writing, Poetry writing – Model making - Clay modeling, Origami, Puppet making – Decorative Art - Rangoli, Ekebana, Wall painting (Mural) – Designing - Computer graphics, CD Cover, Book cover, Collage work – The use of different art forms in Education

Mode of Transaction:
Lecture, lecture cum Discussion, Workshop schedule, Slide / Film show, Project work, Demonstration, Visit , Group work and its Presentation

Practicum: Task and Assignment
1. Develop a script of any lesson in any subject of your choice to perform a Play / Drama.
2. Develop a script for the street play focusing on “Girl’s education and Women empowerment”.
3. Prepare a script of Bhava based on some Socio-political issues.
4. Prepare a pictorial monograph on “Various folk dance of Gujarat”.
5. Prepare a pictorial monograph on “Various Dance forms in India”.
6. Prepare a calendar chart on “Various Musical Instruments in India”.
7. Develop an Audio CD based on newly composed Poems of Gujarati / Hindi language.
8. Prepare some useful, productive and decorative models out of the west materials.
9. Visit the Faculty of Performing Arts in your city and prepare a detailed report on its multifarious functioning.
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. Organize a workshop on some selected Creative Art forms in the school during your School Internship programme and prepare a report on it.
12. Develop a creative design based on your choice for CD Cover or Book cover.
13. Develop a design or picture based on collage work.
14. The work based on visits to places of art, exhibitions and cultural festivals and Perception, reflection, and dramatic/artistic expression (presentation) of any five art, drama and music items relating to any five areas included in the EPC 2 course content
15. Individual visits and writing perception and reflective report (2 items)
16. Group visits (two) and writing perception and reflective report based on class review
17. Individual Expression (presentation) of any two art, drama and music items
18. Group expression (presentation) of any two items

Mode of Assessment
Written test and Tasks and assignments

References:
1. Theory of Drama by A.Nicoll
2. Natya Kala by Dhirubhai Thakar
3. Natyalekhan by Dhananjay Thakar
4. Natakadeshvidesman by Hasmukh Baradi
5. Gujarati theatre no Itihas by Baradi Hasmukh
6. Acting is Believing by Charls McGaw
7. Art of Speech by Kethlin Rich
8. Natya Sahitynaswaroopo by Nanda kumarpathak
9. Bhavai by Sudahaben Desai
10. Bhavai by Krishnakant Kadkiya
11. NatyaManjarisaurabh by G.K.Bhatt
12. Bharat aurBhartiyaNatya Kala by Surendranath Dixit
15. Japan niRangbhum by C.C.Mehta.
   Information and Broadcasting, Government of India.
18. Abhinav Raga Manjari by Pt. Bhatkhande
20. Abhinav Geet Manjari by Ratanjankar
**SECOND YEAR - SEMESTER IV**

**Edn 4: PE - CHILDHOOD AND GROWING UP – II**

**Theory**

Credits 4

**Essence of the course:**

This course makes student-teacher to understand the systematic study of childhood, adolescence and their development, make them to learn children at different ages through theoretical and interaction with learners in school. This course makes student-teachers to understand the developmental nature of the adolescences and it helps them to realize the child exploitation in different aspects, marginalization & stereotyping nature in our culture. In addition to that, it focuses on child labour and how do media focus their realities.

**Objectives:**

At the end of the course the student teachers will be able to

- develop interest to know more about the process of Marginalisation of social difference
- develop a desirable positive attitude towards society stereotype, child law and media of childhood & adolescence
- appreciate the transitional and critical age of childhood and adolescence
- apply the various socio-assessment tools in their real life
- analyse about self

**CONTENT OUTLINE**

**Unit 1: Socio–cultural impact on learner**


**Unit 2: Representing the realities**


**Unit 3: Marginalization of social difference**

Underprivileged sector of society–(Girl child, children in dalit household and differently abled)–present status of underprivileged in India- delinquency child –measures to eradicate marginalization –community involvement, implementation of laws, internalizing values

**Unit 4: Personality and Social Cognition**


**Unit 5: Transfer of Learning & Developing Socio - Assessment ability.**

Modes of Transaction:
Lecture, Assignment, Seminar, Group discussion, Workshop, Film Show, Audio – Video

Practicum: Task and Assignment
1. Prepare a Socio-metric matrix in a classroom
2. Conduct a study on teacher’s knowledge about the cultural space of the learner in a classroom
3. Write a critical study report on portrayal about adolescence in media - particularly Language based
4. Make a survey and write a report based on child Labour status in your Locality
5. Select 30 Girl Child in your village/city and study their social status
6. Interview at least 10 teachers, parents and students about marginalization of social difference and report their suggestions
7. A study on the relational status about self and his/her socio-economic background
8. Conduct a study among the class students’ family members relationship with the help of Genogram & Eco map

Modes of Assessment:
Written test, seminar, presentation, Field Visit

References:
Edn 5: PE - GENDER SCHOOL AND SOCIETY

Theory

Essence of the course:
The course is humble effort made to sensitize gender equality in society and school. The course will enable the student to identify the gender crisis, create awareness on gender equality, refine women’s students being prey to untold atrocities of home and society and equip students with available laws.

Objectives:
At the end of the course the student teachers will be able to
- acquire knowledge on Terms and concepts Gender, school and society.
- understand the challenges faced by the Gendered roles in society through a variety of institutions.
- apply the knowledge to critically analyse the gendered roles, relationships and ideas in textbooks and curricular to nurture or challenging gender disparity of gender inequalities prevailing in the society.
- develop the life skills courses in schools and to deal with some issues of gender identity roles.
- develop interest in studying gendered roles, relationships and ideas in textbooks and curricular.
- develop a positive attitude towards roles and institutions in society.

CONTENT OUTLINE

Unit 1: Gender identity construction

Unit 2: Gender in society and groups
Gender in society – definition, elements of society – agencies of education in society (formal, informal and non-formal) – social system – social structure – social groups – social stratification – social institution (family, caste, religion, culture, media, law and state) and their influence on gender roles.

Unit 3: Gender, sexuality, sexual harassment and abuse
Gender roles and male/ female interaction – men and women in the public world – sex segregation in occupations – linkages and differences between reproductive rights and sexual rights – development of sexuality including primary influences in the lives of children (gender, body image, role models) – sites of conflict: social and emotional understanding – importance of addressing sexual harassment in family, neighbourhood, other formal and informal institutions – agencies perpetuating violence: family, school, work place and media (print and electronic) – Institutions redressing sexual harassment and abuse.

Unit 4: Gender and Law
Gender perspectives in policy and planning – incentive for girls – improving the quality of government schools – gender inputs in school curricular and text books – women teachers in...
school— introduction to law related to women (Rape, Dowry, Re-marriage, Divorce, Property, Inheritance- women reservation bill- history and current status. The Indian Constitution and provisions according to women-human rights and women rights.

**Unit 5: Gender and quality education**

Gender disparity and gender parity – quality education for girls – curricular and co-curricular activities to achieve gender parity – life skill course to deal with gender issues – critical analysis on co-education – strategies to develop parity, gender equality and empowerment – support services for girl’s education – sustainability approach to equality and empowerment – construction of ideas on gender in school framework during post independence period – gender and the hidden curriculum – Teacher as an agent of change – women empowerments through social reform movements

**Mode of Transaction:**
Lecture, Discussion, Team Teaching, Case Study, Film Show

**Practicum: Task and Assignment**
1. Conduct a gender ratio survey in a village and write a report.
2. Analyse and report the differential treatment between the gender in family and neighbourhood.
3. Write a critical report on challenges faced by different women groups in present society based on valid published reports.
4. Organizing drama and debate to develop awareness for sexual abuse.
5. Women day celebration and projects related to women personalities.

**Mode of Assessment:**
Written test and Task and assignment

**References:**
Edn: EPC 4 - CRITICAL UNDERSTANDING OF ICT

Essence of the course:

The ultimate aim of teaching ICT in the discipline of Education is to disseminate the ICT skills across the disciplines and aspire for multiple trajectories of best practices as per needs of the special discipline. The constantly developing field of ICT will always need exploration of new technological advancements in the context of teaching-learning. This course aims to give an understanding of ICT and its potentials in changing social contexts. It will give a broad understanding of ICT that include computing and communication technologies. The students will be able to use basic office automation, Software and other utilities for supporting teaching-learning. This course focuses on equipping the student teachers with

1. A social perspective on the implications of ICT for larger society.
2. skills of basic computer literacy and ICT-aided learning; and
3. skills of applications of ICT in administrative and academic support systems;

Objectives:
At the end of the course, the student teacher will be able to

- acquire knowledge about information and communication technology with its educational aims and principles
- understand effective uses of ICT in teaching-learning, administrative and academic support systems
- apply ICT knowledge in build the 'digital public' and explore software for ICT Integration and Evaluation Procedures
- develop skill in creating ‘learning and teaching resources’ based on ICT
- create interest in ICT Integration with Pedagogy practices
- understand the social, economic, security and ethical issues associated with the use of ICT
- acquire the skill of maintaining the computer system and the skill of trouble shooting with the help of Anti-Virus and Other tools.
- elucidate the application of ICT for Teaching Learning
- develop various skills to use computer technology for sharing the information and ideas through the Blogs and Chatting groups

CONTENT OUTLINE

Unit 1: Digital Technology and Socio-economic Context

Concepts of information and communication technology; Universal access VS Digital Divide - issues and initiatives; – Challenges of Integration of ICT in School; Aims and objectives of National Policy on Information and Communication Technology (ICT) in School Education in India; IT@ School Project; – Components and Objectives of National Mission on Education through ICT (NMEICT), Spoken Tutorials, Gyan Darshan, Gyanvani, Sakshat Portal, eGyanKosh; Virtual laboratory and Haptic technology.
Second Year
Semester 4

Unit 2: Creation of digital resources
creation of teaching resources using Microsoft word, spreadsheet and presentation software: creating and opening documents, saving and sharing documents, text basis, formatting text/cell, unicode fonts, inserting tables, charts, picture etc., page layout, printing and presenting(slide show)documents –MS Publishing Interactive learning with whiteboards

Unit 3: ICT Integration with Pedagogy Practices and Educational Resources
Introduction to Internet: E-mail, Search Engines, Info-Savvy Skills; Digital Age Skills, safe surfing mode; – Internet resources for different disciplines like natural sciences, social sciences, Humanities and Mathematics. – General Introduction to E-learning, Mobile-learning, distance learning, On-line learning, Virtual University, Wikipedia, Massive Open Online Courses (MOOCs); – Social networking

Unit 4: Techno-Pedagogic Skills

Unit 5: ICT and General Administration in Educational Institutions

Mode of Transaction
Project method, CAI, smart board, visual excursion, Discussion, LCD Projection, Demonstration, Lecture, Web Surfing

Practicum: Task and Assignment
Software:
1. Create and present micro or macro lesson for the pedagogical subject using power point presentation and submit in the form of CD and Handouts.
2. Creating and using Blogs and Google Groups, for teaching and learning purpose.
3. Develop digital - learning video resources (using like Camtasia software) and upload to YouTube or any streaming site for educational purpose.
4. Create and present voice narration for any one topic related to your pedagogical subject.
5. List and use any two social media for publishing your article related to education.
6. Develop a report on preparing a lesson plan on any topic from your methods while using internet resources. The report should mention the details of navigating, searching, selecting, saving and evaluating the authenticity of the material and also mention how it adds or justify the facts, _figures(data), graphics, explanation and logic of the topic.
7. Projects that may involve the hardware like LCD Projector, digital camera, camcorder, scanner, Printer, interactive white board and software like word processors (MS Word/Libre Office), spread sheet and Slide Presentation (PPT/impress); and/or Creating and using Blogs and Google Groups, Google Docs
Second Year

8. Integrating technology tools for material production and use in teaching learning
9. Ownership of digital resources created and used in education and developing collaborative networks for sharing and learning
10. Use of ICTs for record keeping, information management in education administration, communication and information sharing/ storing

Hardware:
1. Write a report about how to install software like word processors, spreadsheet and Slide Presentation (with pictures of installation process)
2. Make a inventory to Installation of Operating systems, Windows, installation of essential Software and Utilities; (with pictures of installation process)
3. Connect a computer with various devices including printers, scanners, external storage devices, LCD projector etc. and draw the structure and function of peripheral used.
4. Use of pre-made digital resources such as CDs, Videos available, or download from website and integrate it into meaningful lessons.
5. Practice to present the lesson using interactive whiteboard or LCD projector.

Mode of Assessment
Written test, Task and assignment

References:
3. Information Technology: The Breaking Wave, Tata Macgrow hill


31. ICT transforming education: a regional guide
   http://unesdoc.unesco.org/images/0018/001892/189216e.pdf


THIRD YEAR - SEMESTER V
Edn 6: PE - CONTEMPORARY INDIA AND EDUCATION -I

Theory Credits 4

Essence of the course:
This course provides deep and penetrating analysis of socio-economic concerns in contemporary India and the role of education in suitably meeting the challenges. All the emerging concerns are discussed in their sociological, philosophical, values, cultural, economical, constitutional, and global perspectives.

The knowledge on education, philosophy of education; educational thinkers and their contributions in education, National integration and socialization, international understanding, Indian constitution, the education policies, inclusive education and the role of education in secularism, socialism, democracy etc. will enable the student teachers to emerge as a successful teacher.

It can prove as an effective course to student teachers to understand the challenges of education in the contemporary Indian society and it will surely show the students, the right path in the field of teaching.

Objectives:
At the end of the course the student teachers will be able to
• acquire knowledge of terms and concepts used in Indian society, communities and groups with focus on government policy frame work socialisation and sociological aims of Education
• understand Inequality and the importance of equality, stratification, causes of diversity, marginalised society
• apply the constitutional values related to Education and social diversity
• develop the skills to respect collective living, resolution of tension peacefully and justly
• develop interest on language policies, multilingual education to understand contemporary India and education
• develop the attitude towards plebianisation, liberalisation, privatisation and stratification in Education from global point of view.

CONTENT OUTLINE

Unit 1: Concept and aims of education
Meaning of Education – Formal, non-formal and informal education – Various Agencies of Education – Aims of Education in Contemporary Indian society – Determinants of Aims of Education

Unit 2: Education and Philosophy

Unit 3: Education and Sociology
Meaning and Scope of educational sociology – Social Realities of Indian Society and their educational implications: Diversity in Indian Society; Inequality and Marginalization –Schisms in terms of Caste, Religion, Language, Region and their demands on Education.
Unit 4: Education, Social Change, Social Stratification and Social Transformation

The concepts of social change – Factors of social change – Role of education in the process of social change – Limitations of Education in the process of Social Change – Socialization process – agencies – role of school and family; school as a miniature society; – Social Stratification – Conceptualizing Social Stratification – Forms and Bases of Social Stratification – Impact of social stratification on education and vice versa

Unit 5: Education and Indian Constitution


Mode of transaction of the course:
Lecture method, Peer group, Discussion method, Team teaching, Debates, Brain storming, Workshop, Seminar, Project work, e-learning (edmoda.com)

Practicum activities: Task and Assignment
Planning and Implementation of Activities
- a. field visit to vocational institutes to make reports,
- b. awareness development about population explosion in rural / slum areas,
- c. Preparing a presentation on rich cultural heritage of India

Mode of Assessment
Written test and Task and assignment

References:
Edn 7: PE - LEARNING AND TEACHING-1

Essence of the course:
Modern world is marching towards technology and scientific innovations. Keeping these changes in mind, this course tries to enable the student teachers to be aware of learning and teaching deeply. This also intends to develop a positive attitude towards the process of teaching and learning which would help the trainees to adopt various strategies of learning and teaching with reference to various levels of learning. It also enables the trainees to adopt various modern tools and techniques for facilitating learning and teaching.

Objectives:
At the end of the course, the student teacher will be able to

- Understand the concept of learning and its importance for human excellence
- Apply the learning theories in their teaching
- Understand the processes that facilitate construction of knowledge
- Create facilitative learning environments in schools
- Understand the concept and different levels of teaching
- Adopt different teaching strategies
- Understand the models of teaching
- Adopt ICT tools for facilitating teaching and learning
- Adopt innovative practices of teaching and learning
- Understand teaching as a profession.

CONTENT OUTLINE

Unit 1: Development of learner and learning
Learning – Domains of learning for holistic development – Phases of learning – influence of peer group, group cohesion and group dynamics on learning – Development of learner as a resultant of interactions between individual potential (innate, acquired) and external environment (physical, socio-cultural, ecological, economic and technological) – Nature and nurture, continuity and discontinuity issues, growth and maturation – Implications for teachers to develop holistic understanding of the learner in context.

Unit 2: Theoretical perspectives on learning
Perspectives on human learning: Behaviourist (conditioning paradigm in brief), cognitivist, information-processing view, humanist, social-constructivist (drawing selectively on the ideas of Skinner, Piaget, Rogers, Vygotsky). – Concepts and principles, applicability and Relevance, Role of learner in various learning situations, Role of teacher in teaching-learning situations:

Unit 3: learning in 'constructivist' perspective
Unit 4: Methods of learning

Unit 5: Individual differences among learners
Differential learning needs of the learners with regard to abilities: intelligences, interest, aptitude, creativity, personality, values – learning styles – language (home language and language of instruction) – sociocultural differences (cultural capital), learning difficulties, and their implications for classroom practices and teaching

Mode of transaction: Lecture, discussion, Project work, field trip, assignment, seminar, workshop

Practicum: Task and Assignment
1. Identify the learning styles of the learners and report.
2. Report based on the visit to any two types of schools regarding the records of teaching and learning
3. A case study on the success story of any one school in teaching and learning
4. Write a narrative on teaching learning process in a classroom based on observing a teacher

Mode of Assessment:
Written test and Task and assignment

References:
8(i): Pedagogy of Tamil I – Part 1

Theory

অபসামান্তரம்

சின்னிலா விளக்கம்

பொருளொழியல் சீருப்பதிவு

கற்றுகள்

நூற்றங்கறையும்

அதிந்து

உருவோக்கும்

வைர்ச்ெியின்

சொந்தக்காலத்தில்

விரிவுறர

கறைக்கைஞ்சும், குற்றுகள், மெயிலைறைவு, மபோருைறைவு, நூைறைவு, இறணயம்.

குறைகள்

கூற்று

மமோழியின்

மறோல்கோப்பியம்

மமோழியியல்

இைக்கியத்

அைியல்

நூைகத்றதப்

மெம்மமோழித்

மமோழியின்

வைர்ச்ெிக்கு

கற்பிக்கும்

கற்பித்தல் வைங்கள்

ழியின்

ககோட்போடுகள்

திைறனப்

தோக்கம்

வைர்ச்ெி

8

மிழ்

Education Syllabus

தமிழ்மமோழியின்

மபற்ைிருப்பர்

குைித்து

வறககள்

கோைத்திற்ககற்ப

பயன்கள்

மோணக்கர்

Edn_8: C&PS

ால்

கற்பிக்கும்

ஆெிரியர்

ிறை

செல்லும்

பயன்படுத்து

அைிந்து

ீக்குதல்

- உணர்த்துதல்

அைிந்திருப்பர்.

செல்லும்

அைிந்து

பற்ைி

முறைகள்

மகோள்

அறமப்பிறன

தூண்டுதல்

உயர்தனிச்

தோய்மமோழிறய

ஆற்றுவதோல்

உருவோக்கத்திற்கு

மமோழியியைோையின்

கற்பிக்கும்

கருத்தரங்கம்

இக்கோை இைக்கியங்கைின்

- மெம்மமோழி

Part 1

படிப்பு

பகுதி

உணர்த்து

ய மெய்

அதற்கோன

நூைகங்கைின்

ிறைகள்

குழுவிவோதம்

- மெய்தல்

மெய்தல்

ெிைப்புகள்

றகயோளுதல்

- தல்

கறைச்மெோல்ோக்கம்

கபசுவறதயும்

அைிந்திருப்பர்

கோைத்திற்காக

நூைகங்கைின்

சீருப்பதிவு

தொன்று

கறைச்மெோற்கறை

தமிழில்

- மதோன்றம

அடிப்பறை

அைிந்து

தமிழின்

க ோக்கில்

- வரைோறு

மபறுவர்

முறைகறை

அவெியத்றத

அவெியத்றத

முறைகறை

அைிந்து

பற்ைி

முறைகள்

தமிழின்

மதோன்றம

அடிப்பறை

எற்படுத்துவதோல்

உருவோக்கத்திற்கு

மமோழியியைோையின்

கற்பிக்கும்

கருத்தரங்கம்

இக்கோை இைக்கியங்கைின்

- மெம்மமோழி

Part 1

படிப்பு

பகுதியின்

கற்பிக்கும்

கருத்தரங்கம்

இக்கோை இைக்கியங்கைின்

- மெmem University

4 Year Integrated B.Sc.B.Ed and B.A.B.Ed Programme - Education Syllabus

Edn_32

Pondicherry University
Third Year

Semester 5


Third Year

Semester 5

Education Syllabus

Pondicherry University

1. Practice minimum 3 Micro teaching skills and maintain the record. (Compulsory)
2. தமிழ் பாட்டுக்கள் பதிவு மாறுதல்
3. கறைச்செல்வாகை பதிவு
4. உரை ஜெய்ஸ் தக்கை துளுகை வரவை
5. குறிப்பிட்டு பள்ளிக் கழகத்தின்

புதுக்கோட்டை

1. குருக்களியைப் புதுக்கோட்டை, புதுக்கோட்டை, 1977. பாட்டுப் பாடல் முறைகளின். முதல் பாட்டுப் பாடல் குறிப்பிட்டு
2. எசுகும் நுழைவு, புதுக்கோட்டை, புதுக்கோட்டை, தற்கொம்பையில், விளக்கம்.
5. குருக்களியை, விளக்கம் (2000) பாடல் பாடல் முறைகள், பாடல் பாடல், குறிப்பிட்டு
6. குருக்களியை, விளக்கம், (1990) பாடல் பாடல் முறைகள், பாடல் பாடல், குறிப்பிட்டு
7. எசுகும் நுழைவு, 1988. பாடல் பாடல் முறைகள், பாடல் பாடல், குறிப்பிட்டு
8. எசுகும் நுழைவு, விளக்கம், 2006. பாடல் பாடல் முறைகள், பாடல் பாடல், குறிப்பிட்டு
9. எசுகும் நுழைவு, விளக்கம், விளக்கம், (1983) பாடல் பாடல் முறைகள், பாடல் பாடல்
10. எசுகும், நுழைவு, (2003) பாடல் பாடல் முறைகள், பாடல் பாடல், குறிப்பிட்டு
11. எசுகும், நுழைவு, (1991) பாடல் பாடல் முறைகள், பாடல் பாடல், குறிப்பிட்டு
12. எசுகும், நுழைவு, 2010. பாடல் பாடல், பாடல் பாடல், குறிப்பிட்டு
13. எசுகும், நுழைவு, முறைகள், பாடல் பாடல், குறிப்பிட்டு
14. எசுகும், நுழைவு, பாடல் பாடல், முறைகள், பாடல் பாடல், குறிப்பிட்டு
15. எசுகும், நுழைவு, முறைகள், பாடல் பாடல், குறிப்பிட்டு
16. எசுகும், நுழைவு, பாடல் பாடல், பாடல் பாடல், குறிப்பிட்டு
3rd Year

Semester 5

8 (ii): Pedagogy of English I – Part 1

Theory

Essence of the course:

School education and teacher-education share a symbiotic relationship. To have qualitative improvement in education, both teacher-education and school education need to mutually reinforce each other. NCF-2005 and the Right to Education Act, 2009 suggest a rethinking in the area of teacher-education as well. A need to review and redesign the B.Ed. Syllabus was felt as NCF-2005 expects the teacher to look at school education in a holistic manner. It advocates learner-centered learning rather than teacher-centered teaching. Teacher’s attitude, aptitude and motivation play an important role because the teacher needs to engage with the learning process of the learner. Teacher as a facilitator helps learners to construct their knowledge. The teacher should be able to participate meaningfully to transact the syllabus and textbooks effectively along with teaching-learning materials. Therefore, the teacher should be well-versed not only with the subject content but also with the pedagogy of learning. Language is the medium for comprehending ideas, for reflection and thinking, as well as for expression and communication. This course is visualized as a range of language based activities, which will aid in strengthening the ability to 'read', 'think', ‘discuss and communicate' as well as to 'write' in the language of instruction.

Objectives:

At the end of the course the student teachers will be able to

- understand the aims & objectives of teaching English
- enable the student teachers to acquire knowledge of the sound systems of English and to familiarize them with the appropriate terminology to describe the sounds in English.
- acquire an understanding of the nature and structure of English language and components skills
- enable the student teachers to understand the connections of English speech and to acquire good pronunciation and fluency of speech.
- develop skills for effective teaching—micro teaching.
- understand the importance of Using-English in global context
- get familiarized with the various aspects of the B.Ed. programme with special reference to the nature of the language skills to be developed and evaluation
- familiarize student teachers with the text book contents related to high school and Higher Secondary classes.
- help student teachers acquire a working knowledge of the grammatical terminology and the grammatical system in English.
- acquaint with the planning of instruction.
- develop in the student teachers the ability to write in an appropriate manner for a particular purpose with a particular audience in mind.
- develop an insight into the symbiotic relationship between curriculum syllabus and textbooks
- Get familiarized with the IT sources / packages that are helpful in teaching English

CONTENT OUTLINE

Unit 1: Nature and Scope of English Language Teaching

English for Global purpose- First Language- Second Language - Foreign Language. Utilitarian aim. Objectives of teaching English in India- Problems related to teaching and learning of English in schools-Remedial suggestions to overcome these difficulties.
Unit 2: Spoken English
The different speech organs and their role – the individuals sounds – vowels and consonants – their place and manner of articulation – The concepts of the phoneme and allophone – phonetic transcription – stress – word stress and sentence stress – intonation in English – four basic patterns of intonations in English - Rhythm.

Unit 3: Lexis

Unit 4: Advanced Grammar: I
The noun phrase – MHQ (Modifier, Headword, Qualifier); the verb phrase; Adverbial. Tense forms – auxiliary verbs – The Sentence – Types of sentences – subordinate and co-ordinate clauses – Question forms.

Unit 5: Acquisition of teaching skills
Teaching Skills – meaning, analytical approach to understand teaching learning process in English language in terms of teaching skills – relevant teaching skills in teaching of English – micro teaching as a technique for acquiring teaching skills – integration of teaching skill – strategies – link practice

Mode of transaction:
Introductory lecture, Use of multimedia resources, Library resources, Accessing Online input on the topic, Language Lab, Observation of video clips, Print versions of texts focusing on communication, Dictionary and online referencing, Virtual learning, Usage of Language games, Power point presentation (PPP) for teaching a grammar topic, Micro-teaching through video lessons, Lesson Plan presentation, Mind mapping, Comparative & critical study on various methods and approaches of teaching prose poetry and grammar, Interactive Sessions, Comparative study of various forms of compositions, Demonstration, Small group discussions, Framing, evaluating and interpreting a question paper.

Practicum: Task and Assignment
1. Practice minimum 3 Micro teaching skills and maintain the record. (Compulsory)
2. Seminar on significance of English language in India
3. Project on formation of new words
4. Assignments on learning phrasal verbs
5. Planning of 10 vocabulary building exercises and techniques to teach the students in the classroom
6. Construction of New lexical items and structural items

Mode of assessment:
Analysis of Group discussion, Assessment of expressing ideas and thoughts through suitable examples, Monitoring performance of communicative tasks, Self-assessment and peer assessment, Evaluation based on documentation, Performance evaluation, Feedback

References:
36. Rajeswari N. & Dr. Selvi (2013) Innovations in teaching of English Chennai,
8(iii): Pedagogy of Hindi I – Part 1

पादर्शकर्म: पादर्शकर्म का अधिकार एक्ट 2009 विधालयी शिक्षा तथा शिक्षण प्रशिक्षण के निकट संबंध.

पृष्ठित: 2005 तथा शिक्षा का अधिकार एक्ट 2009 विधालयी शिक्षा तथा शिक्षण प्रशिक्षण के निकट संबंध.


credits 4

शिक्षार्थी शिक्षा तथा शिक्षण प्रशिक्षण के माध्यम से विद्यार्थियों को भूमिका के एक बहुत विशेष परिवर्तन को माप सकती है। पादर्शकर्म के अभी तक शिक्षक, जो है जन के स्रोत के रूप में केंद्रीय रूप से मिलता रहा है, वह सीखने-सीखने की समूही प्रक्रिया के सरस्त्रक और प्रवृत्त रूप में सुख भूमिका निवास ने का काम करते आए है। पर 2005 की स्कूली पादर्शकर्म उनसे माप करती है कि वे सार्वजनिक और जन के स्रोत बन कर न रहे बल्कि विद्यार्थियों द्वारा जन्म हासिल करने की प्रक्रिया में स्वयं के सहारक का। इन सब परिवर्तनों का उनके प्रयोग का हिस्सा बनाने के लिए हृदय और अध्यापक शिक्षा के पादर्शकर्म में परिवर्तन आए। विद्यार्थियों का परिवर्तन को पहले तभी संभव है जब यह विद्यार्थी रूप से जुड़े छात्रों को सादर और उपकारक में परिवर्तन आए और शिक्षक की भूमिका इस विद्यार्थी में सबसे महत्वपूर्ण है। इस दृष्टि से भाषा-शिक्षण का पादर्शक और भी महत्वपूर्ण हो जाता है, क्योंकि भाषा पूरी शिक्षा का आधारित या काम करती है, और यह विद्यार्थी भाषा-सीखना नहीं बल्कि भाषा के द्वारा अन्य विषयों में भी निर्नय लेने की जाता है। इसके साथ ही भाषा से जुड़े नए विषयों, जैसे - बुद्धिमत्तिक कक्षा, सम्मान का माध्यम, शास्त्री की शिक्षा में भाषा की भूमिका आदि की समझ शिक्षक के लिए जरूरी है जो अध्यापक शिक्षा में ज्यादा बदलाब के माप करते है।

वर्तमान पादर्शक भाषा के नए सरोकार और सीखने-सीखने की नई प्रक्रियाओं को ध्यान में रखकर तैयार किया गया है। आशा है कि शिक्षक प्रशिक्षणाध्यापकों को इससे भाषा-शिक्षण की तैयारी में सहयोग मिलेगी।

पादर्शक बोध उद्देश्य
- भाषा की अलग-अलग भूमिकाओं का जानना
- भाषा सीखने की सुधारानुप्रेरक प्रक्रिया का जानना
- भाषा के स्वरूप और व्यवस्था का समझना
- स्कूल की भाषा, बच्चों की भाषा और समझ के बीच के संबंध का जानना
- भाषा के संदर्भ में पढ़ने के अधिकार, शास्त्री और पर्यावरण के प्रति सचेत होना
- भाषा सीखने के तरंगों और प्रक्रियाओं का जानना और समझना
- पादर्शकर्म, पादर्शक और पादर्शकर्मका विश्लेषण कर कक्षा विशेष और बच्चों की समझ के अनुसार बालिका
- भाषा और साहित्य के संबंध का जानना
- हिंदी भाषा के बिच रूपों और अभिव्यक्तियों का जानना
- भाषा और विचारों को स्वतंत्र अभिव्यक्तिक बनाना
- भाषाविद्वानों के प्रति संदर्भों रोल होना
- अनुवाद के महत्व और भूमिका का जानना
- विद्यार्थियों की सुधारानुप्रेरक चमत्कार का प्रदर्शन
- बच्चों के भाषायों विकास के प्रति समझ बनाना और उसे समुनीत करने के लिए विद्यालय में तक-तक के मौके जुटाना
- भाषा के मूल्यांकन की प्रक्रिया का जानना
- साहित्यिक और गैर साहित्यिक मौलिक प्रक्रियाओं की समझ और सराहना
- भाषा सीखने-सीखने की सुधारानुप्रेरक उपकरण का समझना

इकाई 1: भाषा की भूमिका
(बच्चा जब स्कूल आता है तो उसके पास भाषा का एक रूप मिल जाता है। कक्षा में बच्चों की भाषा के इस रूप को समझने देने से उसका आत्मविश्वास बढ़ता है, यह सीखने का बुद्धियाद है।)
1. समाज में भाषा – भाषा और लिंग; भाषा और सत्य; भाषा और अस्मिता; भाषा और वर्ग

2. विद्वानवे में भाषा – घर के भाषा और स्कूल की भाषा; समझ का माध्यम (बच्चे की भाषा); समझ पातसागर में भाषा; जन सुनवार और भाषा; माध्यम भाषा; एक आलोचनात्मक दृष्टि; विश्व वेद रूप में भाषा और मामलय भाषा में अंतर; विविध भाषाकार प्रभाव प्राप्ति; बहुभाषीक कला; शिक्षक-शिक्षार्थी संबंध के पहले के रूप में भाषा

3. सिद्धांत और सिद्धांत समितियों के सिलारों में भाषा-भाषाओं की स्थिति (भाषा 343-351, 3501); कोठारी कमीशन (64 से 66); राष्ट्रीय शिक्षा नीति – 1986; पी.ओ.ए-1992, राष्ट्रीय पादरीचर्या – 2005 (भाषा अध्ययन)

इकाई 2: हिंदी भाषा की स्थिति और भूमिका
हिंदी भाषा की भूमिका: स्वतंत्रता से पहले और स्वतंत्रता के बाद हिंदी; हिंदी के विविध रूप; अंतरराष्ट्रीय स्तर पर हिंदी; जन के भाषा के रूप में हिंदी; हिंदी पढ़ने-पढ़ते को चुनिन्दा।

इकाई 3: भाषा शिक्षण पर एक दृष्टि
(हिंदी में विज्ञान, गणित, समाज विधान और कला सब बहुत हैं पर ये विषय स्वयं हिंदी या भाषा नहीं हैं।)
1. भाषा सोचने सिखाने की विभिन्न दृष्टि – भाषा अर्थन और अधिगम का दार्शनिक, सामाजिक और मतभेदात्मक आधार, समझ भाषा दृष्टि, स्वतन्त्रता दृष्टि। भाषा सीखने-सीखनें को बहुभाषीक दृष्टि आदि (जानबुझे, बुजुर्ग, जे. प्याजे, एल. वायुसेनकी, चौंकी आदि) भारतीय भाषा दृष्टि (पाणिनी, कामत प्रसाद पुर, किसानों दास बाबुप्रथा आदि)।
2. भाषा शिक्षण की प्रकृतिवशिष्यकिंद्रियों और उनका विश्लेषण – व्यक्तारण अनुबाद प्रणाली; प्रत्यय प्रणाली, डॉमांग प्रणाली, प्राकृतिक प्रणाली, ज्ञेयसंगणक (अन्तरराष्ट्रीय/अन्तरअंतरराष्ट्रीय) संगणनार्थ प्रणाली आदि।

इकाई 4: भाषा का स्वरूप
(कोई व्यक्तारण भाषा की चाल को बदल नहीं सकता। भाषा लोक व्यवहार से परिवर्तित होती है।)
1. भाषा व्यवहार के विविध पथ – नियमविध ग्रंथस्थान का रूप में भाषा; भाषा विभाजनस्तर (उच्चारण के संदर्भ में); हिंदी की बोलियाँ। बांक तथा लंबे।
2. भाषा व्यवस्थाएं – सामाजिक व्यक्तारण की संकल्पना; अर्थ की प्रकृति तथा संरचना; व्यक्ति विज्ञान तथा अर्थ विज्ञान की मूलभूत संकल्पनाएँ; स्वनिःस्व विज्ञान और रूप विज्ञान; (उपयुक्त उदाहरण देकर पढ़ें जाएँ।)

इकाई 5: भाषावाद दलिताएं
- संदर्भ में भाषा – संदर्भ में व्यक्तारण और संदर्भ में शब्द
- भाषावाद दलिताएं – सुनना, बोलना, पढ़ना और लिखना
- सुनना और बोलना – सुनने का कौशल, बोलने का तहता- भाषावाद विविधता और हिंदी पर इसका प्रभाव, पढ़ने-पढ़ते पर इसका प्रभाव; सुनने और बोलने के कौशल विकास के हद और सामग्री, रोलपंच, कहानी सुनना, परिवर्तन के अनुसार संवर्द, भाषा मैक, मल्टीमीडिया तथा नैसर्गिक सामग्री की सहायता से संगीतरेखा व्यापार तथा व्यक्तारण का निम्तण
- पढ़ना – पढ़ने का कौशल; पढ़ने के कौशल विकास में समाज का महत्व, मौन और मुख पत्र, गान-पत्र, विस्तृत पत्र, आलोचनात्मक पत्र, पढ़ने के कौशल विकास में सुजातन्त्र साहित्य (कहानी, कविता आदि) सहानुभ, विचार, रचनात्मक किताब पत्रिका और इनसाधनों का उपयोग/महत्व
- लिखना – लिखने के चरण; लेखन-प्रक्रिया, सुजातन्त्र लेखन, आँचलिक और अनन्तराष्ट्रीय लेखन (कहानी, कविता, संवर्द, डायरी, फट, रिपोर्ट, समाचार आदि)

सिखाने का माध्यम
- व्याख्यान
- सार्वजनिक चर्चा
Third Year

Semester 5

- विचारण एवं सामग्री विश्लेषण
- विचारपूर्णता
- विचारण सतहत्यारूपी, लेखकार, एवं कवियता, के क्षेत्र म. चर्चा
- पुस्तकालय संसाधन, का उपयोग
- भाषा प्रयोगशाला
- मॉड्यूलों का प्रयोग
- दृश्य-अभ्यास पाठ, के माध्यम से सूचना विश्लेषण
- व्यक्तरण प्रक्रिया, के शिक्षण हेतु पाठ वाइट प्रस्तुतीकरण
- पाठ योजना प्रस्तुतीकरण
- अन्तर्विकल्प यथ
- प्रश्न पत्र निर्माण, मूल्यांकन एवं विश्लेषण
- शास्त्र कोष तथा आने लायन संदर्भ

प्रायोगिक कार्य
- Practice minimum 3 Micro teaching skills and maintain the record.(Compulsory)
- विश्वस्तर के हिन्दी संस्कृत एवं उपयोग पर विचारपूर्णता
- मौद्रिक एवं लेखन अभिव्यक्ति गतिविधियों
- मुहर्दे, लोकोक्तियाँ। का प्रयोग करते हुए कहानी, लेख आदि लिखना
- विषयवस्तु आधारित अभ्यास
- सूचना एवं व्यापक पाठ योजनाएं, बनाना
- पाठ वाइट प्रस्तुतीकरण
- दृश्य-अभ्यास के माध्यम
- व्यक्तिकित, प्रश्न-पत्र, अंकार्य तथा प्रश्नानुसार विश्लेषण
- विषय वस्तु परीक्षण तथा उपलब्धि परीक्षण की संरचना
- परीक्षण ऑफिस. का प्रस्तुतीकरण
- पाठ से संबंधित प्रायोगिक कार्य

मूल्यांकन के माध्यम
- सामूहिक चर्चा का विश्लेषण
- स्व मूल्यांकन तथा निर्धारित समूह मूल्यांकन
- उपलब्धि मूल्यांकन
- अभिलेखन एवं अभिव्यक्ति आधारित मूल्यांकन
- प्रश्न-प्राप्ति सूचना आधारित मूल्यांकन

संदर्भ- स्रोत
1. अनन्त चौधरी, नागरी लिपि और हिन्दी वर्तमान, विश्व हिन्दी ग्रन्थ अकादमी, पटना।
2. के.के. श्यामाय, मान्यभाषा शिक्षण, विनोद पुस्तक मंदिर, आगरा।
3. के.के. जी.जी. कृष्ण, भाषा सम्बन्धी मूल्यांकन, केन्द्रीय हिन्दी संस्थान, आगरा।
4. के.के. सुभाष, हिन्दी संस्कृति और उनका शिक्षण, रामनारायण लाल, इलाहाबाद।
5. जयनारायण कौलिक, हिन्दी शिक्षण, हरियाणा साहित्य अकादमी, चंडीगढ़।
6. जयनारायण कौलिक एवं विमला कौलिक, पाठ-योजना निर्देशिका हिन्दी शिक्षण, आर्य युक्त डिपो, करोलबाग, नई दिल्ली।
7. जयनारायण कौलिक, शुद्ध हिन्दी लेखन, आर्य युक्त डिपो, करोलबाग, नई दिल्ली।
8. निरंजन कुमार सिंह, माध्यमिक विद्यालयों में हिंदी शिक्षण, राजस्थान यथा अकादमी, जयपुर।
9. भगवती प्रसाद शुकल, हिंदी उच्चारण और वर्तनी, आर्य बुक डिपो, करोलबाग, नई दिल्ली।
10. भोलानाथ तिवारी, भाषा विज्ञान, किताब महल, इलाहाबाद।
11. भोलानाथ तिवारी तथा केलाश भाटिया, हिंदी शिक्षण, लिपी प्रकाशन, दिल्ली।
12. योगेन्द्रजीत, हिंदी भाषा शिक्षण, विनोद पुस्तक मंदिर, आगरा।
13. रघुनाथ सफाया, हिंदी चिक्षण, पंजाब किताब घर, जालंधर।
14. रमेश विहारी लाल, हिंदी शिक्षण, रस्तोगी प्रकाशन, मेरठ।
15. रामशक्ति पांडेय, हिंदी शिक्षण, विनोद पुस्तक मंदिर, आगरा।
16. लक्ष्मीनारायण शर्मा, भाषा की शिक्षण विभिन्न एवं पाठ-नियोजन, विनोद पुस्तक मंदिर, आगरा।
17. वैधनाथ प्रसाद वर्मा, विहार हिंदी यथा अकादमी, पटना।
18. सीताराम चटुर्याधी, भाषा की शिक्षा, हिंदी साहित्य कुटीर, वाराणसी।
19. साधिनी सिंह, हिंदी शिक्षण, लायल बुक डिपो, मेरठ।
20. शारदा भरोसौ, स्वतंत्र विज्ञान और हिंदी की स्वतंत्र व्यवस्था, आर्य बुक डिपो, करोल बाग, नई दिल्ली।
21. हरिदेव विहारी, व्यवहारिक हिंदी व्याकरण, लोक भारतीय प्रकाशन, इलाहाबाद।
8(iv): Pedagogy of Malayalam I – Part 1

Theory

Essence of the course:
Malayalam is the medium for comprehending ideas, for reflection and thinking, as well as for expression and communication. This course deals Evolution of Malayalam Language, Historical development of Malayalam Literature, Language skill, curriculum development in Malayalam, Discourses in Malayalam, Methods of teaching Malayalam, Theories of learning with special reference to Malayalam teaching, Evaluation of learning Malayalam. This course is visualized as a range of language based activities, which will aid in strengthening the ability to 'read', 'think', 'discuss and communicate' as well as to 'write' in the language of instruction.

Objectives:
At the end of the course the student teachers will be able to
- enable the student teachers to acquire knowledge of the sound systems of Malayalam and to familiarize them with the appropriate terminology to describe the sounds in Malayalam.
- enable the student teachers to understand correct Malayalam usage and to acquire good pronunciation and fluency of speech.
- familiarize student teachers with the school syllabuses related to high school classes.
- help student teachers acquire a working knowledge of the grammatical terminology and the grammatical system in Malayalam.
- develop in the student teachers the ability to write in an appropriate manner for a particular purpose with a particular audience in mind.
- realize the significance of teaching Communicative Malayalam.
- develop their skill in curriculum transaction.
- develop a thorough understanding of the conceptual background of Malayalam.
- improve the understanding of the principles of curriculum construction and organization in Malayalam language.

CONTENT OUTLINE

Unit 1: Evolution of Malayalam Language
Over the ages - Status of Malayalam language at different periods - Relationship between language and social development - Functions of language in the society - Influence of mother tongue in the formation of culture - Relevance of mother tongue in a democratic society - Mother tongue as a medium of instruction - Malayalam as an official language

Unit 2: Historical development of Malayalam Literature
Development of Malayalam literature - The influence of Tamil and neighboring languages on Malayalam - Influence of Sanskrit - Contributions of early poets - Contributions of Ezhuthachan - Earlier poets - Earlier prose writers - Development of champu - Development of the present day Malayalam Literature - Development of other forms of literature such as drama, short stories etc. - Development of Malayalam literature till date - Short description of the development of Malayalam Literature.

Unit 3: Language skill
Listening – Speaking – Reading – Writing - Importance of basic skills in language learning-strategies and activities appropriate for different levels-process learning.

Unit 4: curriculum development in Malayalam
Curriculum development-General principles-psychological, sociological, philosophical, needs and interests of learner, nature of subject matter and philosophy of nation - Different approaches to curriculum organization – Spiral, topical and concentric approach - New school Malayalam curriculum and its critical appraisal -- Micro teaching – definition and principles of micro teaching cycle – limitations. – Teaching Skills – meaning, analytical approach to understand teaching learning process in Malayalam in terms of teaching skills – relevant teaching skills in teaching of Malayalam- Core skills

Unit 5: Discourses in Malayalam
Importance of discourses in the daily life - Functions of seminars, symposiums, debates, discussions, speeches, brain storming, screen play, essays, memorandums, letter writing, notice, press notes, editorial, postures, advertisement, travelogue, biography, auto biography, description, dramatization etc. for effective communication.

Mode of Transaction:
Introductory lecture, Use of multimedia resources, Library resources, Dictionary and online referencing, Usage of Language games, Mind mapping, Demonstration, group discussions

Practicum: Task and Assignment
1. Practice minimum 3 Micro teaching skills and maintain the record.(Compulsory)
2. Prepare a short essay on inter relationship between language and social development. (group activity)
3. Open discussion on Mother tongue as a tool for transforming culture
4. Seminar (group) on Need of mother tongue as the medium of instruction
5. Seminar (group presentation)
6. Prepare short essay on 5 sub topics
7. Trace out the activities included in the Text book/Hand book for developing basic language skills among the learners
8. Find out the activities mentioned in the text book and hand book for developing the creativity among the learners.
9. Prepare essay on general principles of curriculum development.
10. Prepare an editorial for your class magazine
11. Prepare postures on any social issues
12. Write a screen play based on any one of the poems in the 8th or 9th std text book
13. Select a poem from any text book and present the same through simulation (group task)
14. Conduct a debate on the relevance of critical pedagogy in the context of the teaching-learning atmosphere prevailing in the schools in Kerala
15. Conduct a seminar on Chomsky’s concept of language development.
16. Analyse and trace out the learning activities included in any one topic on the basis of prescribed curricular objectives (Group task)
17. Analyse any one text book and Trace out new vocabulary, phrases, idioms, proverbs, and grammar contents (group task)
18. Conducts a panel discussion on the relevance of grading system in the B.Ed programme.
19. Prepare a sample question paper considering all the elements of a scientific question paper (group task)

Mode of Assessment
Written test and Task and assignment

References:
2. Damodaran Nair. P – ApasabdaNighantu
4. Parameswaran Nair. P.K – Malayala Sahithya Charithram
5. Raghavan Payyanad – Folklore
6. Balasahithyam Thatwavum Charithravum – State Institute of Children Literature
Calicut: Scorpio
27. SCERT(2007),Kerala Curriculum Frame work. Trivandrum:SCERT
8(v): Pedagogy of Telugu I – Part 1

Theory

Essence of the course:
Objectives:

CONTENT OUTLINE

Mode of Transaction
Practicum: Task and Assignment
Mode of Assessment
References:

Syllabus yet to be prepared for Pedagogy of Telugu I – Part 1.
8(vi): Pedagogy of French – Part 1

Credit: 4

Essence of the course:
This course is to enable students to specialize in teaching French as a foreign language and to develop an understanding of the modern day teaching approaches to teach grammar, vocabulary and pronunciation. The course includes analysis of teaching content and text books.

Objectives:
At the end of the course, the student teacher will be able to:
- understand the basic theories of learning and communication
- understand different approaches of teaching FLE/FLES
- acquire knowledge of various techniques in teaching oral and written skills
- prepare unit plan and activity oriented Lesson plans
- apply the theoretical concepts in classroom teaching
- develop the positive attitude among the students
- stimulate curiosity and creativity

CONTENT OUTLINE

Unit 1: Theories of Learning
Behaviourisme – Rationalisme – Constructivisme - Socio –cognitivisme – Intération de tutelle de Bruner – Intelligences multiples de Gardner
(Manuel de formation pratique : P.29-32.)

Unit 2: Communication in teaching
Quatre théories importantes de la communication pour la didactique - Le non-verbal en classe de langue - Registre de langue – Enonciation – Actes de parole – Intération - Compétence de communication
(Manuel de formation pratique : P. 49-52,52-56, 57-59, 60-61, 62-63, 64-66, 70-71)
Teaching Skills – meaning, analytical approach to understand teaching learning process in French in terms of teaching skills – relevant teaching skills in teaching of French

Unit 3: Didactic strategies for oral skills
(Manuel de formation pratique: P. 96-99, 104-107)

Unit 4: Didactic strategies for written skills
Compréhension écrite: Types de texte – Processus de lecture – Types de lecture – Démarche pédagogique de la compréhension de l’écrit. – Production écrite: Ecrire pour communiquer – Ecriture créative
(Manuel de formation pratique: P.119-120, 122-123, 128, 129-130,133-137, 138-141)

Unit 5: Revision of teaching content (Grammar and Vocabulary) & Teaching of Grammar
Modes et temps – Pronoms– Prépositions - Adjectifs - Adverbes - Articles – Conjonctions de coordination et subordination
Prescribed book: Grammaire Française, Jacqueline Ollivier
Définition de « grammaire » - types de grammaire - grammaire implicite/ explicite – inductive/déductive – Notions: activité, exercice, tâche
(Manuel de formation pratique: P. 183 -195)

Mode of Transaction
Lecturing on theoretical concepts, Project method, Tasks and Assignments.

Practicum: Task and assignment
1. Practice minimum 3 Micro teaching skills and maintain the record.(Compulsory)
2. Seminar on foundation and significance of French language teaching
3. Oral Communication tasks
4. Language Lab activities
5. Preparation of micro lesson plan
6. Preparation of micro lesson plan using computer assisted instruction
7. Sessions in small or medium groups
8. Language games on grammatical structure
10. Project on formation of new words
11. Planning of 10 vocabulary building exercises and techniques to teach the students in the classroom.
12. Assignments & Library work
13. Preparation of audio visual aids(PPT, Charts, Models)
14. Listening to radio news and responding to questions.

Mode of Assessment
Paper-pencil tests, Performance tests, Formal and Informal Testing

References:
1. ABRY D., VELDEMAN-ABRY J. La phonétique : audition, prononciation, correction, CLE, 2007, 1CD
6. OLLIVIER JACQUELINE et BEAUDDAIN MARTIN, Grammaire française, 5e édition, Montréal, Groupe Modulo,
8. TAGLIANTE., CHRISTINE., La classe de langue, coll, Techniques de classe, CLE international, 2006
8(vii): Pedagogy of Mathematics I – Part 1

Theory Credits 4

Essence of the course: This course is to enable student teachers to specialize in mathematics teaching to develop an understanding of the curriculum and linking school knowledge with community life. The course includes reconstruction of mathematical knowledge through appropriate pedagogic processes and to communicate meaningfully with students.

Objectives: At the end of the course, the student teacher will be able to
- appreciate the nature, structure, scope of Mathematics and its relation with other disciplines.
- acquire knowledge of the nature and development of Mathematics
- understand the aims and objectives of teaching Mathematics
- prepare unit plan and activities oriented Lesson plans for effective classroom communications.
- prepare the prospective Mathematics teachers as facilitators for effective teaching and learning of Mathematics.
- apply different methods and techniques of teaching of Mathematics and to employ them proficiently in the classroom
- develop the positive attitude among the student in teaching Mathematics
- appreciate the role of Mathematics in day-to-day life
- stimulate curiosity, creativity and inventiveness in Mathematics

COURSE CONTENT

Unit 1: Nature and Significance of Mathematics

Unit 2: Great mathematicians and contributions

Unit 3: Aims, Goals and Objectives of Learning Mathematics
Aims: Practical, Disciplinary, Cultural, Vocational, Social and Aesthetic - Taxonomy of Educational of objectives: cognitive, affective and psychomotor domains for teaching Mathematics - Revised Bloom’s Taxonomy of Educational of objectives with specifications - General Instructional objectives: Knowledge, Understanding, Application, Skill, Interests, Attitude, Appreciation and Personality traits - Writing General Instructional objectives, specific learning outcomes and teaching points of various content areas in Mathematics.

Unit 4: Teaching skills
Teaching Skills – meaning, analayitical approach to understand teaching learning process in mathematics in terms of teaching skills – relevant teaching skill in teaching of mathematics –
core teaching skills, meaning, components, observation procedure, writing lesson plan, for the following core teaching skills – Writing instructional objectives – Introducing a lesson, Fluency in Questioning , Probing Questioning, Explaining, Illustrating with Examples, Stimulus Variation, Reinforcement, Using Blackboard and Closure – micro teaching as a technique for acquiring teaching skills - Integration of Teaching Skills – Meaning, Need and Strategies – Vicarious integration and summation.

Unit5: Methods and Techniques of Teaching for Facilitating Learning Mathematics

Modes of Transactions:

Practicum: Task and Assignment
1. Practice minimum 3 Micro teaching skills and maintain the record.(Compulsory)
2. Study any one of eminent mathematician and his contribution to development of Mathematics– submit report
3. Writing specific objectives and teaching point of content areas in Mathematics of Algebra.
4. Prepare a year plan for any standard at the Secondary level.

Learning Activities:
Learning the Content and practicing them appropriately, Oral work, drill, Review and Practising Pedagogical Aspects for different areas of School Curriculum.

Mode of Assessment:

References:

WEB Resources
1. www.infodev.org
3. www.infodev.org
5. www.classle.net
6. www.famous-mathematicians.org
7. www.thesecondprinciple.com
8. www.arvindguptatoys.com
9. www.ricum.edu.rs
10. www.ndlrn.edu.au
11. www.bbc.co.uk/learning/subjects/maths.shtml
12. www.primaryresources.co.uk/maths/maths.htm
13. www.mathtutordvd.com
**8(viii): Pedagogy of Physical Science I – Part 1**

**Theory**

**Credits 4**

**Essence of the course:**

Physical Science is a general science, after having learning this Course, student teachers understand the epistemological and pedagogical bases of physical science subject. They Pedagogy is integration of knowledge about the learner, the subject and the societal context. This course comprises of - the nature of the physical science subject, the aims and pedagogical approaches for the teaching of physical science at different stages of school; and deeper theoretical understanding of children in diverse social contexts.

The student-teachers will revisit basic concepts of physics and chemistry which was given in upper primary and secondary school books. The student-teachers will work with such theoretical studies as well as on the field with school children from different backgrounds. They will capable to critically examine teaching learning processes that incorporate enquiry, discovery, conceptual development, activity based learning, etc. within the classroom.

**Objectives:**

At the end of the course, the student teacher will be able to

- acquire knowledge of nature, values and modern approaches in physical science teaching.
- understand learning objectives and curriculum approaches in physical science teaching.
- apply acquired knowledge of various methods and technique in teaching physical science.
- develop skill in adopting various approaches of learning in physical science teaching.
- develop interest in participating the practice teaching.
- develop desirable positive attitude towards contribution of eminent scientist for development of physics and chemistry.
- acquire hands-on experience in designing and developing suitable learning aids for classroom instruction.

**COURSE CONTENT**

**Unit 1: Nature of physical science**

Meaning, scope – nature of physical science: Science as a dynamic and expanding body of knowledge – Science as a process of enquiry and a process of constructing knowledge – science as interdisciplinary area of learning – values in teaching physical science: individual, social.

**Unit 2: Aims of learning physical science**

Aims of Learning Science – Knowledge and understanding through science – Nurturing process skills of science – basic and integrated science process skills and their fostering – Development of scientific attitude and scientific temper – Nurturing the natural curiosity, creativity and aesthetic sense. Contribution of eminent scientists: Albert Einstein, Isaac Newton, Neils Bohr, C. V. Raman, J.C. Bose, Marie Curie.

**Unit 3: Learning objectives of physical science:**

Meaning of learning objectives – Revision of Bloom’s taxonomy by Anderson and Krathwohl –learning objectives for upper primary, secondary and higher secondary stages – Learning objectives in the constructivist perspective.
Unit 4: Teaching skills
Teaching Skills – meaning, analytical approach to understand teaching learning process in physical science in terms of teaching skills – relevant teaching skills in teaching of physical science – core teaching skills, meaning, components, observation procedure, writing lesson plan, for the following core teaching skills – set induction, skill of explaining, skill of blackboard writing, skill of stimulus variation, skill of reinforcement, skill of probing questioning and skill of demonstration. – Micro teaching as a technique for acquiring teaching skills
Link practice – needs and importance.

Unit 5: Teaching resources
Machine operated aids: epidiascope, filmstrip-cum-slide projector, Over Head projector, digital projector, inter- active white board.
Non– Machine operated aids:
Graphical aids: flash cards, charts, flip chart, graphs, pictures, poster, and cut-outs.
Display Board: chalkboard, bulletin, flannel, magnetic, peg board and effective uses.
3D aids: objects, specimens, models.

Mode of transaction:
Lecture-demonstration method, Project method, Problem-solving method, CAI, Observation method (field visit/exhibition/internship), Seminar/ discussion

Practicum: Task and Assignment
1. Practice minimum 3 Micro teaching skills and maintain the record.(Compulsory)
2. “Science as a dynamic and expanding body of knowledge” prove this statement with any one of the concept in physical science from school science books.(discussion)
3. Study the scientific attitude among the school teacher in your internship programme (survey).
4. Collect information from the internet about any 2 great scientist’s contributions to society (present it in slideshow form).
5. Compare the leaning objective of physical science subject for upper primary, secondary with respect to other country through internet (Data collection).

Mode of Assessment:
Written test, Task and assignment, Laboratory work

References:

**Web Resources:**

1. http://famousphysicists.org/
3. www.ncert.nic.in/departments/nie/desm/publication/.../phy_sci_partI.pdf
4. www.ncert.nic.in/departments/nie/desm/publication/.../phy_sci_PartII.pdf
8(ix): Pedagogy of Biological Science I – Part 1

Theory Credits 4

Essence of the course:
This course is intending to enhance the ability and skill of the student teacher in understanding the importance of science and its relevance to the existence of life in this earth and to teach the same with different Techniques and approaches to the students of science learner. The student teacher will be acquainted with such steps involved in planning the science teaching and implementing the different methods and techniques in teaching of the same and further direct himself to do research. Further it helps him to develop desirable positive attitude towards science teaching and its development.

Objectives:
At the end of the course, the student teacher will be able to
- Understand the nature of science and aims and objectives of teaching Biological Science.
- understand the microteaching skills
- Acquiring skills related in planning the lessons and presenting them effectively.
- Develop a theoretical and practical understanding of the various methods and techniques of teaching Biological Science.
- Understand the criteria in selecting a good textbook and to evaluate Science textbook.
- Understand the techniques of evaluating Science teaching and to construct an achievement test to assess the learning outcomes of pupils.
- Estimate the facilities required for the organization and maintenance of Science laboratory.
- Understand the special qualities of a Science teacher and to acquire those qualities.
- Understand the basic concepts in science for science teaching.
- Acquire a favourable scientific temper towards science teaching and values.
- Develops favourable positive attitude towards research on science teaching.

CONTENT OUTLINE

Unit 1: Nature of Science
Historical background of science – origin its Meaning, Scope, Nature -Science as a dynamic and expanding body of Knowledge-Science as an interdisciplinary approach-correlation of science subjects – Science as a process of enquiry and a process of constructing knowledge – Science to the Society-Value development- Intellectual, Utilitarian, aesthetic, disciplinary, training in scientific attitude, vocational.

Unit 2: Aims and objectives of teaching Biological Science
Aims of learning Biological Science Objectives of teaching at Secondary School Level-Difference between Instructional Objectives and Learning Objectives – Learning Objectives-General Objectives-Specific objectives based on Bloom’s taxonomy – Mastering on Collaborative vs Constructivist Perspectives in planning the lesson plan

Unit 3: Curriculum in Biological Science
Meaning –Curriculum Framework – Curriculum and Syllabus – Principles of curriculum construction – Approaches to curriculum – Development. – Recommendations of National curriculum frame work on science curriculum-Analysis of Biological science syllabi and textbooks of NCERT.
Unit 4: Teaching skills
Teaching Skills – meaning, analytical approach to understand teaching learning process in biological science in terms of teaching skills – relevant teaching skills in teaching of biological science – core teaching skills, meaning, components, observation procedure, writing lesson plan, for the following core teaching skills – Skill of Introduction – Skill of Explaining – Skill of questioning – Skill of demonstration - Skill of reinforcement -Skill of Stimulus Variation. Skill of black board – micro teaching as a technique for acquiring teaching skills – Link lesson practice

Unit 5: Learning resources
Science Textbook: Characteristics and evaluation of a good science textbook – use of text book
Science library: values, book selection and organizing library work in science.
Science museum: importance, essential and desirable item - preparation of museum materials, organization and management.

Modes of transaction:
Lecture method, Assignment Method, Report writing, Field visit & Preparation of Field report, Laboratory Method, Presentation by students, Demonstration of scientific experiments.

Practicum: Task and Assignment
1. Practice minimum 3 Micro teaching skills and maintain the record.(Compulsory)
2. Critically compare Biological science syllabi of NCERT and State board at upper primary and secondary stage through respective website.
4. Museum collection (preserved plants and animals)
5. Collection of rare specimens (ie. seeds, insects, algae, shells and feathers)

Mode of Assessment:

References:
7. Central Board of Secondary Education. (2010), Manual for Teachers on School Based Assessment Classes VI to VIII. Delhi.
22. UNESCO: Mordern Trends in Teaching Biological Sciences Vols III.

Web resources:
3. https://conbio.org/professional-development/education-programs
8(x): Pedagogy of Social Science I – Part 1

Theory

Essence of the course:
This course sensitizes the learners the relevance of social science in the current context. It makes them familiar about the techniques and approaches of teaching social science. This course acquaints the preparation and administration of learning resources in the meaningful way. It develops the competency in making use of appropriate assessment system to apprise the learning outcomes. It also sensitizes the learners about the various social issues and mould them to face the same in a plausible way.

Objectives
At the end of the course, the student teacher will be able to

- acquire basic knowledge and skills to analyze and transact the Social Science curriculum effectively following wide-ranging teaching
- acquire a conceptual understanding on the process of teaching and learning Social Science
- sensitize and equip student teachers to handle social issues and concerns in a responsible manner.
- Develop ability for critical and logical thinking and apply the acquired knowledge and skills in unfamiliar situations
- Acquaint with different methods, approaches and techniques of teaching social science
- Develop ability to design different evaluation tools
- Develop practical skills for analyzing socio-economic, political and physical phenomena

CONTENT OUTLINE

Unit 1: Nature and Scope of Social Science
Meaning, Scope, Content and Concept of Social Science – Features of Social Science – Classification of Social Science - Difference between Social Science and Social Studies – Social Science relationship between History, Geography, Civics and Economics – Need and importance of Social Science in Modern age.

Unit 2: Aims and Objectives of Teaching Social Science
General and Specific aim of Teaching Social Science at secondary level – Relationship between the objectives of teaching Social Science with special reference to the objectives of Secondary education commission - anticipated outcomes of the Teaching of Social Science – The values inherent in Social Science: aesthetic, moral, utilitarian, intellectual and vocational – Values of National Integration and International Understanding.

Unit 3: Teaching skills
Teaching Skills – meaning, analytical approach to understand teaching learning process in social science in terms of teaching skills – relevant teaching skills in teaching of social science – core teaching skills, meaning, components, observation procedure, writing lesson plan, for the following core teaching skills – skills of explaining, questioning, stimulus variation, using black board, and closure– micro teaching as a technique for acquiring teaching skills – integration of teaching skill – strategies – link practice
Unit 4: Design of Lesson Plan

Need and importance of lesson plan – steps in lesson plan – Stating of instructional objectives- offering appropriate learning experiences to achieve the formulated objectives. – different models/approaches for writing lesson plan – preparation of unit plan

Unit 5: Methods and approaches for Teaching Social Science

Approaches: learner centered approach and activity centered approach, group learning, and problem solving – Methods: observation method, project method, field trip, dramatization, discussion, assignment, lecture method, and Team teaching.

Mode of Transaction

Lecture cum discussion, Dramatization, Field visit, Debate, Panel Discussion.

Practicum: Task and Assignment

1. Practice minimum 3 Micro teaching skills and maintain the record. (Compulsory)
2. Preparation of a practical records on the basis of the observation of school practice undergone during the first week of internship
3. A detailed report may be prepared after visiting the various institutions which are practicing innovative approach in transaction modalities

Mode of Assessment

Unit test, Project, Preparation of assignments, Preparation Teaching aids, Seminar Presentation.

References:

Third Year  

8(xi): Pedagogy of Computer Science I – Part 1

Credit: 4

Essence of the course:
This course is to enable students to specialize in Computer science and to develop an understanding of the curriculum, linking school knowledge with community life. The course includes reconstruction of Computer Knowledge through appropriate pedagogic processes and to communicate meaningfully with children.

Objectives:
At the end of the course, the student teacher will be able to
- enable the student teachers acquire knowledge on Fundamentals of Computer.
- acquaint the student teachers with the aim of teaching computer science at various levels.
- help the students teachers in acquiring skills relating to planning lessons and presenting them effectively.
- familiarise the student teachers with the various methods of Teaching Computer Science.
- understand the Computer Science curriculum and various approaches.
- make the student teachers aware of the use of various instructional materials and aids in Teaching of Computer Science.
- enable the student teachers acquire knowledge on Computer Evaluation.

CONTENT OUTLINE

Unit 1: Introduction to Computers

Unit 2: Aims of Teaching Computer Science
Introduction – Aim and Objectives of Teaching Computer Science – based on Bloom’s Taxonomy of Educational objectives – Computer Science Teaching at different levels: Primary, Secondary and Higher Secondary levels.

Unit 3: Teaching skills
Teaching Skills – meaning, analytical approach to understand teaching learning process in computer science in terms of teaching skills – relevant teaching skills in teaching of computer science – core teaching skills, meaning, components, observation procedure, writing lesson plan, for the following core teaching skills – Set induction - Skill of explaining, stimulus variation, reinforcement, Questioning, Blackboard writing, Skill of Demonstration - Skill of Closure – micro teaching as a technique for acquiring teaching skills – integration of teaching skill – strategies – link practice.

Unit 4: Lesson, Unit and Year Planning
Lesson Planning: Importance of lesson plans, writing instructional objectives and planning for specific behavioral changes. – Different models/approaches for writing lesson plan – Unit Planning: Preparation and use of unit plan, Year planning.
Unit 5: Methods of Teaching in Computer Science


Mode of Transaction

Lecturing on Theoretical Concepts, use of computers in lab, Analytic and Synthetic Methods of Teaching, Project Method, Tasks and Assignments

Practicum: task and assignment

1. Practice minimum 3 Micro teaching skills and maintain the record.(Compulsory)
2. Prepare digital lesson plan
3. Conduct Online Quizzes or E- Quizzes
4. Prepare E-Content (any two topics)
5. Develop a CAI Package (Using Visual Basic Programming)
6. Prepare any two E-assignments
7. Prepare Program Learning Material

Mode of Assessment

Written tests, task and assignments.

References:

Edn 9: C&PS - PEDAGOGY OF SCHOOL SUBJECT II

9(i): Pedagogy of Tamil II - Part 1

தமிழ் அறிவியல் வகுப்பு II - பகுதி 1

Theory

Credits 4

அப்படி செய்யப்படும்:

கட்டுறரத்தில் கூறப்பட்டுள்ள சுல்தான அதன் பிறந்துநூற்றை கூறுவது குறியீடுகள். கட்டுறரத்தில் கூறப்பட்டுள்ள சுல்தான உருவம் பயிற்றலை நிறைவு செய்யும். தைத்தியம் நேரடிக் கருத்துச் செல்வது கட்டுறரத்தில் கதற்சுடவையும் குறியீடுகள் சுருக்கமாக்கும் பயிற்றலை நிறைவு செய்யும். மூழ்கில் பெற்றுள்ள நூற்றை குறியீடுகள் வைத்து குறியீடுகள் சுருக்கமாக்கும் பயிற்றலை நிறைவு செய்யும். பெருமையான பயிற்றலை குறியீடுகள் வைத்து குறியீடுகள் சுருக்கமாக்கும் பயிற்றலை நிறைவு செய்யும்.

இலக்கைகளை:

1. கட்டுறரத்தில் திறகக்கத்தில்

2. கூறப்பட்டுள்ள விளைந்து

3. பொருளிலான கருத்திச்
Third Year Semester 5

4. Practice minimum 3 Micro teaching skills and maintain the record. (Compulsory)

5. Compile the following readings:

1. Practice minimum 3 Micro teaching skills and maintain the record. (Compulsory)


34. \textit{Microteaching: The Edge Method}. (1990)

37. \textit{Microteaching: The Edge Method}. (1990)

40. \textit{Microteaching: The Edge Method}. (1990)
42. \textit{Microteaching: The Angle Method}. (1990)

43. \textit{Microteaching: The Edge Method}. (1990)
44. \textit{Microteaching: The Contour Method}. (1990)

46. \textit{Microteaching: The Edge Method}. (1990)

49. \textit{Microteaching: The Edge Method}. (1990)

52. \textit{Microteaching: The Edge Method}. (1990)

55. \textit{Microteaching: The Edge Method}. (1990)

58. \textit{Microteaching: The Edge Method}. (1990)
9(ii): Pedagogy of English II – Part 1

Theory

Essence of the course:
Equipping the student with English knowledge for communication and Literature for appreciation. Developing the skill of communication in order to help children at various school levels towards effective communication. The course focuses on developing the ability of the future teachers to transact language in inclusive classroom.

Objectives:
At the end of the course, the student teacher will be able to
- develop English Language teaching competency.
- understand and appreciate the importance of English.
- have a critical study of learning English as a second language in the multilingual Indian Society.
- understand the role of English in India and to improve English Language attainment.
- produce the different methods, techniques and strategies of ELT.
- Prepare and use appropriate teaching aids to make teaching more effective.
- develop the various micro skills to teach English language.
- acquire the skill of preparing lesson plans to teach English.

CONTENT OUTLINE

Unit 1: Foundation and importance of English language teaching

Unit 2: Aims and objectives of teaching English as a second language
Aims of teaching English at the primary, Secondary and higher secondary level. English as a Link Language – Functions of language, Linguistic Principles of English Language Teaching; a Library Language, Window on the west, English as an asset language- Objectives of teaching English as a second language – a) skill based (LSRW); b) ICT Language- Difference between learning a mother tongue and a foreign language.

Unit 3: Teaching skills
Teaching Skills – meaning, analytical approach to understand teaching learning process in English in terms of teaching skills – relevant teaching skills in teaching of English as second language – core teaching skills, meaning, components, observation procedure, writing lesson plan, for the following core teaching skills – skill of stimulus variation, probing questions, using black board, reinforcement and explaining – using micro teaching as a technique for acquiring teaching skills – integration of teaching skill – strategies – link practice

Unit 4: Methods of teaching English
Direct method, Bilingual method, Dr. West method, Audio-video method – CAI (Computer assisted Instruction), CALT (Computer assisted language teaching), CLT (Communicative language teaching)- Play-way method.
Unit 5: Acquisition of language elements

Parts of speech, Tense forms, sentence – classification; types of sentences – simple, compound and complex; pattern of sentences, forms of sentences: active and passive and question tags.

Mode of Transaction:

Use of multimedia resources, Library resources, Accessing Online input on the topic, Print versions of texts focusing on communication, Usage of ICT, Introductory lecture, Micro-teaching through video lessons, Lesson Plan preparation, Demonstration, Mind mapping, Small group discussions, Dictionary and Online referencing, Language Lab activities

Practicum: Task and assignment

1. Practice minimum 3 Micro teaching skills and maintain the record.(Compulsory)
2. Seminar on foundation and significance of English language teaching
3. Oral Communication tasks
4. Language Lab activities
5. Preparation of micro lesson plan using computer assisted instruction
6. Sessions in small or medium groups
7. Language games on grammatical structure

Mode of Assessment:

Evaluation based on documentation (written) – Address the level of pupil involvement in Group Discussion – Performance evaluation (seminar, project and assignment) – Monitor the ability to distinguish between similar concepts – Use of Checklist to monitor, rate performance in each skill – Monitoring performance of communicative tasks

References:

15. Françoise Grellet. (1986) Developing reading skills, CUB.
पुस्तकांक:
यादृच्छिक पाठ्यक्रमांतररंग 2005 तथा शिक्षा का अधिकार एक ट 2009 विद्यालयी शिक्षा तथा शिक्षण प्रशिक्षण के निम्नत संबंध को व्याख्या म. रखते हुए, शिक्षकों की भूमिका में एक बड़ा हुआ परिवर्तन को मीण करता है। पाठ्यक्रम में अभी तक शिक्षकों को ही जाने के माध्यम से कंटेंट स्थान मिलता रहा है, वह सीखने-सिखाने की समस्याओं के संरचनात्मक और प्रवेशक संरचनात्मक के रूप में मुद्रण भूमिका निभाने का काम करते है। पर 2005 को स्कूली पाठ्यक्रम उससे मीण करता है कि वे सुचनाओं के मूल्यांकन और जाने के माध्यम से न रहे बल्कि विद्यार्थियों द्वारा जाने हासिल करने की प्रक्रिया में स्वयं को सहायक बनाने। इन सब परिवर्तनों को उनके व्यक्तिगत का हिस्सा बनाने के लिए जरूरी है कि अध्यापक शिक्षा के पाठ्यक्रम में परिवर्तन आए। विद्यालयी शिक्षा व्यवस्था में परिवर्तन की पहल संभावना है जब इस व्यवस्था से जुड़े लोगों को सीच और तृणकोण में परिवर्तन आए और शिक्षक की भूमिका इस व्यवस्था में स्वयं महत्वपूर्ण है। इस तृण से भाषा-शिक्षण का पाठ्यक्रम और भी महत्वपूर्ण हो जाता है, क्योंकि भाषा पूरी शिक्षा को आधारशिक्षा का काम करती है, जहाँ सिर्फ़ भाषा पढ़ना-सीखना नहीं बल्कि भाषा के द्वारा अन्य विषयों में भी निर्देश प्राप्त करने को इसका अर्थ है। इससे साथ ही भाषा से जुड़े एक दिन। जैसे – बहुभाषी कक्षाएँ, समलॉज़ का माध्यम, शांति की शिक्षा में भाषा की भूमिका आदि की समस्या शिक्षक के लिए जरूरी है जो अध्यापक शिक्षा के लिए अभावी है।

परिलक्षण पाठ्यक्रम भाषा के नए संरचनाओं और सीखने-सिखाने को नई उपस्थितियों को ध्यान में रखकर तैयार किया गया है। आशा है कि शिक्षक प्रशिक्षणाधीनों को इससे भाषा-शिक्षण की तैयारी में सहायता मिलेगी।

पाठ्यक्रम के विशेष उद्देश्य

- भाषा के अलग-अलग भूमिकाओं को जानना
- भाषा सीखने की सुजानक्ष प्रक्रिया को जानना
- भाषा के स्वरूप और व्यवस्था को समझना
- स्कूल की भाषा, वचन की भाषा और समझ के बीच के संबंध को जानना
- भाषा के संरचन में पहुंच के अधिकार, साहित्य और पर्यावरण के प्रति समस्त होना
- भाषा सीखने के तरीके और प्रक्रिया को जानना और समझना
- पाठ्यक्रम, पाठ्यक्रम और पाठ्यपुस्तक का विशेषण कर कक्षा विशेष और वचन की समझ के अनुसार बालक
- भाषा और साहित्य के संबंध को जानना
- हिंदी भाषा के विविध क्षेत्र और अभिव्यक्तियों को जानना
- भाषा और विचारों का स्वरूप अभिव्यक्तिकरण करना
- भाषाधिकार को प्रति संवेदनशील होना
- अनुवाद के महत्व और भूमिका को जानना
- विद्यार्थियों की सुजानक्ष प्रक्रिया को पहचानना
- वचन के भाषात्मक विकास के प्रति समझ करना और उसे सम्बन्धित करने के लिए विवाद में तरह-तरह के मौके जुटाना
- भाषा के मूल्यविवेक को प्राप्त करना
- साहित्यिक और गैर साहित्यिक मौलिक रचनाओं की समझ और सराहना
- भाषा सीखने-सिखाने की सुजानक्ष। तृणकोण को समझना

कस्टैंड 1: लिपी एवं भाषा
साहित्यिक लिपी की ईशानकांता एवं अन्य भारतीय लिपियों से निष्क्रिय – भाषा-विकास में लिपी का महत्व – हिंदी भाषा का पाठ्यक्रम में स्थान
Practicum: Task and Assignment

1. Practice minimum 3 Micro teaching skills and maintain the record.(Compulsory)
2. Other practicum activities relevant to the syllabus.

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<td>डा. विजयराव कुमार्य</td>
<td>हिंदी शिक्षण अन्य भाषा के संदर्भ में</td>
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<td>2.</td>
<td>कामता प्रसाद गुरु</td>
<td>हिंदी व्यक्तरण</td>
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<td>3.</td>
<td>डा. रामचंद्र वर्मा</td>
<td>अच्छी हिंदी</td>
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<td>4.</td>
<td>डा. नारायण सिंह</td>
<td>आधुनिक साहित्य की प्रवृत्तियाँ</td>
</tr>
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<td>5.</td>
<td>डा. रामसात्त्विक पाण्डेय</td>
<td>विषय साहित्य के बाद</td>
</tr>
<tr>
<td>6.</td>
<td>डा. लक्ष्मीनारायण रामराव</td>
<td>देवनागरी लिपि और व्यापक</td>
</tr>
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<td>7.</td>
<td>डा. उमेशप्रसाद सराय वी चुलिया</td>
<td>हिंदी शिक्षण</td>
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<td>8.</td>
<td>डा. रामदेव पी. चुलिया</td>
<td>यूक्षम शिक्षण</td>
</tr>
<tr>
<td>9.</td>
<td>केन्द्रीय हिंदी संस्थान के प्रकाशन -1. हिंदी का वैज्ञानिक व्यक्तरण</td>
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<td>2. देवनागरी लेखन तथा हिंदी व्यवस्था</td>
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<td>3. हिंदी शिक्षण विविध आयाम</td>
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<td>4. हिंदी शिक्षण अन्तरराष्ट्रीय परिप्रेक्ष्य</td>
<td></td>
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<td>5. द्वितीय भाषा शिक्षण में अभिकल्पित अधिग्रह की तैनाति</td>
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<td>6. भाषा शिक्षण तथा भाषा विज्ञान</td>
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</tbody>
</table>
Third Year
Semester 5

9(iv): Pedagogy of Malayalam II – Part 1

Theory

Essence of the course:
This course equipping the student teacher with Malayalam knowledge for communication and its values for appreciation. It helps to prepare and use the various teaching aids in learning of Malayalam. It also develops the skill of communication in order to help children at various school levels towards effective communication. The course focuses on developing the ability of the future teachers to transact language in inclusive classroom.

Objectives:
At the end of the course, the student teacher will be able to
- develop positive attitude towards mother tongue (Malayalam), the rich and vivid culture of Kerala, Arts of Kerala and Folklore etc.
- develop the five basic skills such as reception, expression, creative ability, aesthetic sense and productivity.
- develop linguistic abilities – vocabulary, sentence pattern, proverbs, idioms, grammatical structure etc.
- develop an insight into the historical and contemporary relationship with other Dravidian languages, Indo-Aryan languages.
- acquaint the trainee with advanced development in the theory relating to the teaching of mother tongue.
- acquaint the trainee with some of modern methods, techniques, procedures in teaching mother tongue.
- help the student to improve his professional competency and consciousness as a language teacher.
- acquaint the trainee with the use of different teaching aids, materials and media used in language teaching.
- develop computer skill in curriculum transaction.

Unit 1: Values of Teaching Malayalam
Disciplinary and cultural values: Mother tongue as medium and experiences – Means of developing imagination, aesthetic taste and creative talents - Mother tongue as the key to social and cultural heritage. To inculcate social, moral and spiritual values – perception, expression, appreciation and culture.

Unit 2: Values of Teaching Malayalam – Application consideration
Application consideration: The correlation of the study of Malayalam with other languages. How far the knowledge in the mother tongue can be utilized in the study of other languages Sanskrit, English, Hindi and Tamil - Helps the covering of a major area of human experiences - Gives the essential basis for the study of all other languages and subjects in curriculum.

Unit 3: Instructional Objectives
Concept of objective based instruction – Relationship among the objectives – learning experience and evaluation - Instructional objectives and specification of Malayalam with
special reference to Bloom’s Taxonomy - The aims and objectives of teaching mother-tongue at the school level.

**Unit 4: Techniques and Strategies of Teaching Malayalam**
Mother-tongue as medium of thoughts and communication of ideas, emotions and experiences – means of developing imagination, aesthetics taste, creative talents – key to social and cultural heritage – inculcate social, moral and spiritual values – reception, expression, creative ability, aesthetic sense and productivity – importance of language in life – especially mother tongue – education – culture, thinking special life technology and democracy.

**Unit 5: Methods of teaching Malayalam**

**Mode of Transaction**
Dialogue, seminars, discussions, and group-work

**Practicum: Task and Assignment**
1. Practice minimum 3 Micro teaching skills and maintain the record.(Compulsory)
2. Five relations of other language
3. Prepare a note on Malayalam curriculum in High School
4. Write an essay on approaches of Malayalam language in primary classes
5. Critically analyse the objective of teaching mother tongue.
6. Prepare a teaching manual on the basis of Bloom’s taxonomy.
7. Critically analyse five different methods & approaches in Malayalam language study.

**Mode of assessment:**
Written test and Task and assignment

**References:**
2. Damodaran Nair. P – Apasabda Nighantu
4. Parameswaran Nair. P.K – Malayala Sahithya Charithram
5. Raghavan Payyanad – Folklore
6. Balasahithyam Thatwavum Charithravum – State Institute of Children Literature
9(v): Pedagogy of Telugu II – Part 1

Theory

Essence of the course:
Objectives:

CONTENT OUTLINE

Mode of Transaction
Practicum: Task and Assignment
Mode of Assessment
References:

Syllabus yet to be prepared for Pedagogy of Telugu II – Part 1

9(vi): Pedagogy of Mathematics II – Part 1

The same syllabus as given in course – 8(vii)

9(vii): Pedagogy of Physical Science II – Part 1

The same syllabus as given in course – 8(viii)

9(viii): Pedagogy of Biological Science II – Part 1

The same syllabus as given in course – 8(ix)
Edn: Int 1 - SCHOOL INTERNSHIP

Practicum

School Internship (4 Weeks)

During internship in the third year, student teacher shall spend 4 weeks, spread over several days throughout the 5th or 6th Semester. This will include one week of school engagement and three weeks of other engagements as explained in the syllabus.

This will include one week of school engagement by the student teacher making observation in the school and 3 weeks for visit to innovative centers of pedagogy and learning, educational resource centres and community resources. Within the institution, the observation will focus on understanding the institution in totality, with reference to features such as its philosophy and aims, organization, teachers’ role, student needs with respect to their development, curriculum, its transaction and assessment. This period can also be spent for working on projects and tasks based on the course papers in school or out of the school. The observation record and/or project report of the student teacher should be the base for awarding CCE marks by the faculty.

Edn: Int 2 - COMMUNITY LIVING CAMP

Practicum

Each college of education shall organize a camp of a minimum of 5 days and provide training on community life, First-aid/ Scouts & Guides /Social service / health and hygiene/etc. the camp may preferably be held outside the college in a rural setting.

The 5 days programme should include the participation of student teachers in community life, awareness creation on clean India, Environment, disaster management and other topics of social and current interest, tree plantation, cultural programme and other activities in the village along with local people.

A self-study report regarding the camp from planning stage to camp evaluation stage along with necessary photograph should be submitted for continuous and comprehensive evaluation.
Edn: **EPC 5: SOFT SKILL**

**Practicum**

**Credits 2**

**Objectives**

- To develop communication competence in prospective teachers.
- To enable them to convey thoughts and ideas with clarity and focus.
- To develop report writing skills.
- To equip them to face interview & Group Discussion.
- To inculcate critical thinking process.
- To prepare them on problem solving skills.
- To provide symbolic, verbal, and graphical interpretations of statements in a problem description.
- To understand team dynamics & effectiveness.
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- To understand team dynamics & effectiveness.

**Unit 1: Problem Solving skill and Decision Making Skill**

*Problem Solving:* Identifies and states the problem - Views problems as a stepping stone to success - Finds ways to solve different kinds of conflicts

*Decision Making:* Decisive and convincing - able to analyse the alternatives critically - Takes decisions logically - Shows readiness to face challenges

**Unit 2: Critical Thinking & Creative Thinking**

*Critical Thinking:* Assesses the statements and arguments - Examines the problems closely - Listens carefully and gives feedback - Tries to find out alternatives and solutions - Questions relevantly

*Creative Thinking:* Ability to find creative and constructive solutions to problems and issues - independent in thinking - fluency in expression - rich imagination and is able to think out of the box.

**Unit 3: Interpersonal Relationships**

- able to interact effectively with peers and teachers - cheerful and friendly - Exhibits fine etiquettes and other social skills - share and discuss the feelings with others - Responsive to others’ interests and concerns - Teambuilding, respecting and sharing responsibility, Group Discussion, Presentation Skills, Technology-based Communication.

**Unit 4: Effective Communication Skill**

- the difference between assertive, aggressive and submissive manners of communication - able to make use of speech, action and expression while communicating - Listening Skills: Exhibits good listening skills - Non-verbal Communication and Body Language, uses gestures, facial expressions and voice intonation to emphasize points - Clarity and Concision

- Writing Skills, Technical Writing, Letter Writing, Job Application, Report Writing, Interview Skills,

**Unit 5: Self-Awareness and Empathy**

*Self-Awareness:* aware of physical/social and emotional self - Self-respecting - Aware of strengths and weaknesses - Adopts optimistic approach - the confidence to face challenges
Empathy: Demonstrates ability to respect others - Managing Emotions - express feelings in a healthy manner - Remains cool and calm under adverse conditions - Dealing with Stress

REFERENCE:
- Shalini Verma (2014); “Development of Life Skills and Professional Practice”; First Edition; Sultan Chand (G/L) & Company
- John C. Maxwell (2014); “The 5 Levels of Leadership”, Centre Street, A division of Hachette Book Group Inc.
- CBSC(2010), “Manual for Teachers on School Based Assessment Classes VI to VIII”, New Delhi
Third Year
Semester 6

THIRD YEAR - SEMESTER VI
Edn 10: PE - LEARNING AND TEACHING – II

Theory

Essence of the course:
Modern world is marching towards technology and scientific innovations. Keeping these changes in mind, this course tries to enable the student teachers to be aware of learning and teaching deeply. This also intends to develop a positive attitude towards the process of teaching and learning which would help the trainees to adopt various strategies of learning and teaching with reference to various levels of learning. It also enables the trainees to adopt various modern tools and techniques for facilitating learning and teaching.

Objectives:
At the end of the course, the student teacher will be able to

• Understand the concept of learning and its importance for human excellence
• Apply the learning theories in their teaching
• Understand the processes that facilitate construction of knowledge
• Create facilitative learning environments in schools
• Understand the concept and different levels of teaching
• Adopt different teaching strategies
• Understand the models of teaching
• Adopt ICT tools for facilitating teaching and learning
• Adopt innovative practices of teaching and learning
• Understand teaching as a profession.

CONTENT OUTLINE

Unit 1: Innovative practices in learning
Techniques for higher learning-conference, seminar, symposium, workshop and panel discussion, field trips, social camps, educational tours, ICTs and changing venues of teaching and learning, strategies for active learning, multicultural understanding in teaching and learning, learning with new technologies, online tools of learning, pedagogy of online learning and virtual learning.

Unit 2: Concept of Teaching
Meaning, definitions, criteria for teaching – teaching an art or a science? – relationship between teaching and learning – analysis of the concept of teaching - teaching as a deliberately planned process: analysis in terms of teaching skills – general model of instruction – Pre-active, Interactive and Post active phases and teachers role in them.

Unit 3: Approaches to Teaching
Various Approaches to Teaching, such as, Behaviourist, Cognitivist, Constructivist, Connectionist, Participatory, Cooperative, Personalized, Wholistic

Unit 4: Models of Teaching
Models of Teaching-Meaning and elements and families of models of teaching-Information processing models(Concept Attainment and Advance organizer models), Social interaction
models (Jurisprudential model) – Personal development model (Non-directive teaching) – Behavior modification model (Contingency Management)

Unit 5: Teaching as a profession and values of teachers
Profession – meaning, characteristics – professional ethics and values - code of ethics – critical analysis of teaching as profession, job and occupation, profession and professionalism, Skills and competencies required for a teacher, Teacher as a purveyor and facilitator of knowledge and Essential qualities of a teacher.

Mode of transaction: Lecture, discussion, Project work, field trip, assignment, seminar, workshop

Practicum: Task and Assignment
1. Writing criticism on any one of the innovative practices in learning (Symposium, Seminar, Workshop or Panel Discussion)
2. Analyze and record the suitability of different tools of ICT for learning.
3. Teacher trainee participation in observation and reporting of the learning aspects of marginalised students in school learning.

Mode of Assessment:
Written test and Task and assignment

References:


Edn 11: PE - CONTEMPORARY INDIA AND EDUCATION -II

Theory

Credits 4

Essence of the course:
This course provides deep and penetrating analysis of socio-economic concerns in contemporary India and the role of education in suitably meeting the challenges. All the emerging concerns are discussed in their sociological, philosophical, values, cultural, economical, constitutional, and global perspectives.

The knowledge on education, philosophy of education; educational thinkers and their contributions in education, National integration and socialization, international understanding, Indian constitution, the education policies, inclusive education and the role of education in secularism, socialism, democracy etc. will enable the student teachers to emerge as a successful teacher.

It can prove as an effective course to student teachers to understand the challenges of education in the contemporary Indian society and it will surely show the students, the right path in the field of teaching.

Objectives:
At the end of the course the student teachers will be able to

- acquire knowledge of terms and concepts used in Indian society, communities and groups with focus on government policy framework socialisation and sociological aims of Education
- understand Inequality and the importance of equality, stratification, causes of diversity, marginalised society
- apply the constitutional values related to Education and social diversity
- develop the skills to respect collective living, resolution of tension peacefully and justly
- develop interest on language policies, multilingual education to understand contemporary India and education
- develop the attitude towards plebianisation, liberalisation, privatisation and stratification in Education from global point of view.

CONTENT OUTLINE

Unit 1: Education for Marginalised

Unit 2: Language policies in education.
Language policies – during post-independence period – three language formula – mother tongue as medium of instruction – English versus regional language as medium of instruction.

Unit 3: Issues in education
Unit 4: Programmes and policies

Unit 5: Initiatives for educational development in India
Publication of dispatches– implementation of policies – education in five year plans– role of education in community mobilisation– integration of school and community work– role and responsibilities of teacher – Education policy under debates over time – problems in implementation, financial allocation, field condition and pressure groups – comparison of issues between pre and post-independence period.

Mode of transaction of the course:
Lecture method, Peer group, Discussion method, Team teaching, Debates, Brain storming, Workshop, Seminar, Project work, elearning (edmoda.com)

Practicum activities: Task and Assignment
1. Study the impact of Right to Education Act on schools
2. Critical Analysis of Different Committees and Commissions on Education
3. Study of Educational Process in Private Schools
4. Planning and Implementation of Activities (any one)
   a. Eco-Club,
   b. instructional material to inculcate values,
   c. creating awareness among SC/ST students about various schemes and scholarships available to them,
   d. survey of schools to see the implementation of various incentives of government to equalize educational opportunities

Mode of Assessment
Written test and Task and assignment

References:
43. Pylee, M.V. 2002, India’s Constitution, S.Chand & Company Ltd, New Delhi.
Edn 12: PE - SCHOOL MANAGEMENT – I

Theory Credits 4

Essence of the course:
The focus of the course is on the essentials of school management and the challenges therein. This course is designed to throw light on the concepts of management related to School. The purpose is to foster proper understanding of these essential concepts and to create necessary managerial skills and capabilities among student teachers so as to enable them efficiently manage schools.

Objectives:
At the end of the course, the student teacher will be able to

- Understand the basic concepts of school management.
- Understand different components of school management
- Realize the multifaceted role of teacher/head teacher.
- Sensitize the student teachers about the concept of child rights in the process of School Management.
- Explain the factors contributing to the success of supervision and to acquaint with the modern trends in Supervision and Inspection.
- Discuss the present examination system and suggest some innovations.

CONTENT OUTLINE

Unit 1: Introduction to School Management
Meaning, Definitions, Aims and Scope of School Management - Objectives, Principles and Types of Educational Management, Theories of management relevant to School - Administrative Structure of Education in India - Vision and Mission of Educational Institutions: Primary, Secondary, and Higher Secondary

Unit 2: School as an Organisation

Unit 3: Teacher and School Management
Concept of Effective Teaching - Code of Conduct: Professional ethics - Qualification of effective teacher - Evaluation of Effectiveness - Professional Growth – Significance of (INSET: In-service Education for Teacher) - Status of the Teacher - Accountability of Teacher - Recommendations of various commissions.

Unit 4: Head Teacher as School Manager

Unit 5: Management of Resources in School
Issues related to management of Physical Resources of a School, Human Resource Management –concept of Human Relations in a School, Group Dynamics, Motivating People,

**Mode of Transaction:**
Lecture, Discussion, Project work, Field visits, Assignment, Seminar, Workshop, etc

**Practicum: Task and Assignment**
1. Critical analysis of recommendations of various committees and commissions on School Plant/School-Community relationship
2. Case study of best practices in School management
3. Comparison of school management practices among Govt, Aided and unaided schools
4. Search in the internet and report the problems faced by the teachers and head of the school in the school management.

**Mode of Assessment:**
Written test, task and assignment.

**References:**
4. A New Approach to School Management - Dr. M.S. Sachdeva
5. Administration of Education in India - P.D. Shukla
9. Educational Administration, Supervision and School Management
11. Guidance of Sarva Siksha Abhiyan, M.H.R.D., Govt. of India
12. Modern Approach to School Organisation and Administration - Dr. M.S. Sachdeva
13. School Education and Management - Vijaya Kumari Kaushik, Sharma S.R.
14. School Organisation and Administration - Dr. K.S. Sidhu
15. Secondary School Administration - S.K. Kochhar
16. Teacher Education: Principles, Theories and practices
17. Teachers Role, Status, Service Conditions and Education in India (Doaba House)
Edn 13: C&PS - PEDAGOGY OF SCHOOL SUBJECT I

13(i): Pedagogy of Tamil I – Part 2

Theory

Credits 4

அமாவாசை சாலையைல்

பாடல்பிரித்துறுத்துபவனும் பாடல்பிரித்துறுத்துபவனும் குறிப்பிட்டுபவனும் அதிர்வான ஒன்றுறுத்துக்கான எழுத்துறுத்துக்கன் மற்றையும் பாடல்பிரித்துறுத்துக்கன் மற்றையும் வத்துறுத்துக்கன் அதிர்வான ஒன்றுறுத்துக்ககற்பிக்கும். கருத்துறுத்துக்கன் மற்றையும் பாடல்பிரித்துறுத்துக்கன் மற்றையும் வத்துறுத்துக்கன் அதிர்வான ஒன்றுறுத்துக்ககற்பிக்கும். பாடல்பிரித்துறுத்துக்கன் மற்றையும் வத்துறுத்துக்கன் அதிர்வான ஒன்றுறுத்துக்ககற்பிக்கும். வத்துறுத்துக்கன் மற்றையும் பாடல்பிரித்துறுத்துக்கன் மற்றையும் வத்துறுத்துக்கன் அதிர்வான ஒன்றுறுத்துக்ககற்பிக்கும். பாடல்பிரித்துறுத்துக்கன் மற்றையும் வத்துறுத்துக்கன் அதிர்வான ஒன்றுறுத்துக்ககற்பிக்கும்.

சுருக்கங்கள்

• பாடல்பிரித்துறுத்துக்கன் மற்றையும் வத்துறுத்துக்கன் அதிர்வான ஒன்றுறுத்துக்கன்.
• வாக்குறுத்துபவனும் குறிப்பிட்டுபவனும் அதிர்வான ஒன்றுறுத்துக்கன் மற்றையும்.
• தொகுதிக்குறுத்துபவனும் தொங்குறுத்துபவனும் அதிர்வான ஒன்றுறுத்துக்கன்.
• மகோண்டுளைறையும் மார்கோன்றுறுத்துபவனும் அதிர்வான ஒன்றுறுத்துக்கன்.
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• மகோண்டுளைறையும் மார்கோன்றுறுத்துபவனும் அதிர்வான ஒன்றுறுத்துக்கன்.
• மகோண்டுளைறையும் மார்கோன்றுறுத்துபவனும் அதிர்வான ஒன்றுறுத்துக்கன்.

அடை 1: பாடல்பிரித்துறுத்துபவனும் பிரித்துறுத்துபவன் பிரித்துறுத்துபவனும் மார்கோன்றுறுத்துபவன்- பிரித்துறுத்துபவன மார்கோன்றுறுத்துபவன்- பிரித்துறுத்து மார்கோன்றுறுத்து, பிரித்துறுத்து மார்கோன்றுறுத்து

அடை 2: பாடல்பிரித்துறுத்து

தொகுதிக்குறுத்துபவன- விளக்குறுத்துபவன- மார்கோன்றுறுத்து- குறுத்துபவன- மார்கோன்றுறுத்து- குறுத்துபவன- சுருக்குறுத்துபவன- விளக்குறுத்தும் குறுத்தும் விளக்குறுத்து, குறுத்தும் விளக்குறுத்து

அடை 3: மார்கோன்றுறுத்து

மார்கோன்றுறுத்து- மார்கோன்றுறுத்து- மார்கோன்றுறுத்து- மார்கோன்றுறுத்து- மார்கோன்றுறுத்து- மார்கோன்றுறுத்து- மார்கோன்றுறுத்து- மார்கோன்றுறுத்
Third Year

Semester 6

1. **Introduction to Computer Science**
   - Dr. K. Sridhar, Pondicherry University, 1995.
   - Dr. R. Viswanathan, Pondicherry University, 2000.

2. **Database Management Systems**
   - Dr. M. Ramalingam, Pondicherry University, 2000.

3. **Operating Systems**
   - Dr. K. Ramesh, Pondicherry University, 2000.

4. **Computer Networks**
   - Dr. S. Murugesan, Pondicherry University, 2000.

5. **Software Engineering**
   - Dr. V. Srinivasan, Pondicherry University, 2000.

6. **Computer Architecture**
   - Dr. P. Balakrishnan, Pondicherry University, 2000.

7. **Artificial Intelligence**
   - Dr. C. Ramesh, Pondicherry University, 2000.

8. **Machine Learning**
   - Dr. S. Kannan, Pondicherry University, 2000.

9. **Digital Signal Processing**
   - Dr. K. Ramasamy, Pondicherry University, 2000.

10. **Image Processing**
    - Dr. M. Murugan, Pondicherry University, 2000.

11. **Computer Graphics**
    - Dr. V. Ramakrishnan, Pondicherry University, 2000.

12. **Database Administration**
    - Dr. K. Sridhar, Pondicherry University, 2000.

13. **Computer Ethics**
    - Dr. K. Ramesh, Pondicherry University, 2000.

14. **Computer Security**
    - Dr. V. Srinivasan, Pondicherry University, 2000.

15. **Computer Forensics**
    - Dr. M. Murugan, Pondicherry University, 2000.

16. **Computer Networks**
    - Dr. K. Sridhar, Pondicherry University, 2000.

17. **Web Development**
    - Dr. V. Srinivasan, Pondicherry University, 2000.
13(ii): Pedagogy of English I – Part 2

Essence of the course:
School education and teacher-education share a symbiotic relationship. To have qualitative improvement in education, both teacher-education and school education need to mutually reinforce each other. NCF-2005 and the Right to Education Act, 2009 suggest a rethinking in the area of teacher-education as well. A need to review and redesign the B.Ed. Syllabus was felt as NCF-2005 expects the teacher to look at school education in a holistic manner. It advocates learner-centered learning rather than teacher-centered teaching. Teacher’s attitude, aptitude and motivation play an important role because the teacher needs to engage with the learning process of the learner. Teacher as a facilitator helps learners to construct their knowledge. The teacher should be able to participate meaningfully to transact the syllabus and textbooks effectively along with teaching–learning materials. Therefore, the teacher should be well-versed not only with the subject content but also with the pedagogy of learning. Language is the medium for comprehending ideas, for reflection and thinking, as well as for expression and communication. This course is visualized as a range of language based activities, which will aid in strengthening the ability to 'read', 'think', ‘discuss and communicate' as well as to 'write' in the language of instruction.

Objectives:
At the end of the course the student teachers will be able to
- understand the aims & objectives of teaching English
- enable the student teachers to acquire knowledge of the sound systems of English and to familiarize them with the appropriate terminology to describe the sounds in English.
- acquire an understanding of the nature and structure of English language and components skills
- enable the student teachers to understand the connections of English speech and to acquire good pronunciation and fluency of speech.
- develop skills for effective teaching—micro teaching.
- understand the importance of using-English in global context
- get familiarized with the various aspects of the B.Ed programme with special reference to the nature of the language skills to be developed and evaluation
- familiarize student teachers with the text book contents related to high school and Higher Secondary classes.
- help student teachers acquire a working knowledge of the grammatical terminology and the grammatical system in English.
- acquaint with the planning of instruction.
- develop in the student teachers the ability to write in an appropriate manner for a particular purpose with a particular audience in mind.
- develop an insight into the symbiotic relationship between curriculum syllabus and textbooks
- Get familiarized with the IT sources / packages that are helpful in teaching English

CONTENT OUTLINE

Unit 1: Lesson Planning
Bloom’s Taxonomy of Educational Objectives – General and Specific Instructional Objectives
Lesson planning Characteristics, Need and advantages, Lesson Plan format – Teaching Prose
Third Year

– Poetry -Teaching of different language form Prose, Poetry- Aims, Objectives, and Steps of teaching prose, poetry and supplementary reading– different model/approaches in writing lesson plans.

Unit 2: Compositions

Unit 3: Teaching Learning materials (TLM)
Language games – Language lab -Newspaper for teaching English -Blackboard Sketches-Use of TV, E-tool: Computers and Internet for teaching English - Use of information communication technology (ICT) for teaching English- use of www, E-learning, Teleconferencing.

Unit 4: Pedagogic Analysis
Pedagogic analysis - concept overview- importance and component -Content analysis understanding relation between curriculum, syllabus and textbook.

Unit 5: Evaluation and interpretation of data
Need for assessment -Type of tests – oral, written, objective, subjective – diagnostic, achievement tests- Formative, summative evaluation- Construction and administration of achievement test- Analysis and interpretation of test data.

Mode of transaction:
Introductory lecture, Use of multimedia resources, Library resources, Accessing Online input on the topic, Language Lab, Observation of video clips, Print versions of texts focusing on communication, Dictionary and online referencing, Virtual learning, Usage of Language games, Power point presentation ( PPP) for teaching a grammar topic, Micro-teaching through video lessons, Lesson Plan presentation, Mind mapping, Comparative & critical study on various methods and approaches of teaching prose poetry and grammar, Interactive Sessions, Comparative study of various forms of compositions, Demonstration, Small group discussions, Framing, evaluating and interpreting a question paper.

Practicum: Task and Assignment
1. Textual exercises
2. Dramatization and miming.
3. Activities & competitions for Creative writing.
4. Practicing Formal and Informal Letter
5. Preparation of blue prints, question papers, marking scheme and question wise analysis.
6. Construction of test items for diagnosis and achievement test and Interpretation of test data.

Mode of assessment:
Analysis of Group discussion, Assessment of expressing ideas and thoughts through suitable examples, Monitoring performance of communicative tasks, Self-assessment and peer assessment, Evaluation based on documentation, Performance evaluation, Feedback
Third Year

Semester 6

References:
23. Dr. K sivarajan (2010) Trends and development in modern Educational practices kerala University press
13(iii): Pedagogy of Hindi I – Part 2

प्रवृत्तियाँ:
राज्यीय पाद्यविषयांश संरक्षा 2005 तथा शिक्षा का अधिकार एक्ट 2009 विद्यालयी शिक्षा तथा शिक्षण प्रशिक्षण के निकट संबंध.

को व्याख्या से बदलने है शिक्षा. को भूमिका में एक बहुत बड़ा परिवर्तन का मीण करती है। पाद्यविषयांश में अभी तक शिक्षका. को ही जान के स्रोत के रूप में के द्वार धारण नियम और संबंध एवं प्रबंधक के रूप में मुख्य भूमिका निभाने का काम करते आ रहे। पर 2005 की स्कूली पाद्यविषयांश उनसे मीण करती है कि वे सुधारों के वितरण और जान के स्रोत बन कर न रहे बहुत विधायिकाओं द्वारा जान हासिल करने की प्रक्रिया में स्वयं को सहायक माने। इन सब परिवर्तनों को उनके व्यवहार का हिसाब देने के लिए ज़रूरी है कि अध्यापक शिक्षा के पाद्यविषय ने रूपांतरित रूप से पहले भी भीबिल की। विभागीय शिक्षा व्यवस्था में परिवर्तन का काम अभ्यासक और उत्कृष्ट करने के लिए सरकार और दृष्टिकोण द्वारा परिवर्तन आए और शिक्षक की भूमिका इस व्यवस्था में सबसे महत्वपूर्ण है। इस दृष्टि से भाषा-शिक्षण का पाद्यविषय और भी महत्वपूर्ण हो जाता है, क्योंकि भाषा पूरी शिक्षा का आधार करती है, जहाँ प्रत्येक भाषा गंभीर-सीधेना नहीं बंटक भाषा के द्वारा अन्य विधियों में भी नियुक्त किया जाता है। इसी सहित ही भाषा से जुड़े नए सिद्धांतों का, समझ का माध्यम, उच्चता के शिक्षण में भाषा की भूमिका आदि को समझ शिक्षक के लिए ज़रूरी है जो अध्यापक शिक्षा के व्यापक व्यवस्थाको मीण करते हैं।

वर्तमान पाद्यविषय भाषा के नए संरचनकों और सीखने-सिखाने की नई उपलब्धियाँ को ध्यान में रखकर तैयार किया गया है। आशा है कि शिक्षक प्रशिक्षणलग्नियों को इससे भाषा-शिक्षण को तैयारी में सहायता मिलेगी।

पाद्यविषय के विएो उद्देश्य
- भाषा के आलोचनात्मक भूमिकाओं को जानना
- भाषा सीखने को सृजनात्मक प्रक्रिया को जानना
- भाषा के स्वरूप और व्यवस्था को समझना
- स्कूल की भाषा, बच्चों की भाषा और समस्त के बीच के संबंध को जानना
- भाषा के संदर्भ में पढ़ने के अधिकार, विधि और पर्यावरण के प्रति सत्यता होना
- भाषा सीखने के तरीके और प्रक्रिया को जानना और समझना
- पाद्यविषय, पाद्यविषय और पाद्यपूर्वतक का विश्लेषण कर कश्चिह विशेष और बच्चों को समझ के अनुसार बालना
- भाषा और साहित्य के संबंध को जानना
- हिंदी भाषा के विविध रूपों और अभिव्यक्तियों को जानना
- भाषाओं और विधायिकाओं के विश्लेषण पर्यावरण होना
- अनुवाद के महत्व और भूमिका को जानना
- विधायिकाओं की सृजनात्मक क्षमता का पहचानना
- बच्चों के भाषायी विकास के प्रति समझ बनाना और उसे समृद्ध करने के लिए विद्यालय में तरह-रूप से मौकें जुड़ना
- भाषा के मूल्यांकन की प्रक्रिया को जानना
- साहित्य का और अन्य साहित्यिक मौलिक रचनाओं को समझ और सराहना
- भाषा सीखने-सिखाने के सृजनात्मक दृष्टिकोण को समझना
इकाई 1: भाषा शिक्षण द्वारा अपेक्षित योग्यताओं का विकास
उच्चारण, वर्ण, शब्द वाचन, पठन लेखन, चिंतन एवं अभिव्यक्ति की योग्यताओं का विकास। अपेक्षित विकास हेतु विभिन्न उपाय

इकाई 2: भाषा
हिंदी की ध्वनियाँ, मुख्य विवरण म. उच्च माध्यम स्तर का वाक्यक्रम, हिंदी भाषा म. उच्च माध्यम की समस्याएं, अभिव्यक्ति के कारण, की पहचान महत्वपूर्ण शिक्षा, तक्ष शिक्षण म. उच्च माध्यम ठीक करने के विकास तथा अन्य भाषात्मक योग्यताएँ

इकाई 3: भाषात्मक संस्करण
पर्रूमार गुजरात का प्रश्न - अभिव्यक्ति, श्रमार्थना, निम्नज्ञ, अस्पष्टनिरूपण, स्वीकृति, धर्मवाद जापान, उच्च स्तर म. गद्दार, एवं कविताओं का वाचन, सारणी, रेखानिर्देश, मानचित्र आदि का वर्णन एवं विश्लेषण, कहानी सुनाना तथा पहली आदि का वर्णन

इकाई 4: भाषा का जनसंचार परिषद्ध
युवति जनसंचार - सामाचार पत्र भाषा, टेलीफोन एवं ट्रूटरी के माध्यम, प्रचार-प्रसार भाषा, सोशल नेटवर्किंग भाषा, सोशल नेटवर्किंग साइट का शरीक विस्तार (फेसबुक, ट्विटर, यू ट्युब, व्हाट्स एप) व्लागिंग एवं ई-अध्यापन

इकाई 5: पाठ योजना और उसकी उपयोगिता
कविता, कहानी, निबंध, नाटक आदि विधाओं का शिक्षण एवं उनकी पाठ योजना

सिखाने का माध्यम
- व्याख्यान
- सामूहिक चर्चा
- निर्देश एवं सामग्री विश्लेषण
- विचारगोटी
- विभिन्न साहित्यकार, लेखक, एवं कवियों के विषय म. चर्चाएँ
- पुस्तकालय संसाधन का उपयोग
- भाषा प्रसंगशाला
- मौखिक विलास का प्रयोग
- दूरसंचार-प्रवाह पत्रिका के माध्यम से सूचना शिक्षण
- व्यक्तिगत प्रकरण के शिक्षण हेतु पात्र व्हाइट प्रस्तुतिकरण
- पाठ योजना प्रस्तुतिकरण
- अंतर्गतिक योग्यता
- प्रस्तुति पत्र, निर्देश, मूलंदक एवं विश्लेषण
- शाखाक्रम तथा आनलाइन संख्यात्मक अभियान

प्रायोगिक कार्य
- विवरण पर हिंदी की उपयुक्तता एवं उपयोगिता पर विचारगोटी
- मौखिक एवं लेखन अभिव्यक्ति गतिविधियाँ
- सुनावलैंड, लोकोक्तित्व का प्रयोग करते हुए कहानी, लेख आदि लिखना
- विचार-व्यवहार आधारित अभ्यास
- सूचना एवं व्यापक पाठ योजनाएँ, बनाना
Third Year
Semester 6

- पावर वाइट प्रस्तुतीकरण
- दुरुच्छा-श्रव्य समाप्ति का निर्माण
- व्युत्पन्न, प्रस्त-पत्र, अंकोपेजना तथा प्रभापुर्णभ के लिए प्रश्न
- विवाद वस्तु परीक्षा तथा उपलब्ध परीक्षा की संचालन
- परीक्षा आंकड़ा का प्रस्तुतीकरण
- पाठ से संबंधित प्रायोगिक कार्य

मूल्यांकन के माध्यम
- सामूहिक चर्चा का निर्माण
- स्व मूल्यांकन तथा निकट समूह मूल्यांकन
- उपलब्ध भूमिका मूल्यांकन
- अभिलेख एवं अभिव्यक्ति आयोजित मूल्यांकन
- प्रत्येक-आयोजन सूचना आयोजित मूल्यांकन

संदर्भ - स्रोत
1. अनन्त चौधरी, नागरी लिपी और हिन्दी वर्तनी, बिहार हिन्दी ग्रन्थ अकादमी, पटना।
2. के० क्षेत्रिया, मात्रभाषा शिक्षण, विद्यालय पुस्तक मंडिर, आगरा।
3. के० कृष्णरसोगी, भाषा सम्पादक हिंदी परीक्षण, केन्द्रीय हिंदी संस्थान, आगरा।
4. के० के० सुखिया, हिन्दी ध्वनियाँ और उनका शिक्षण, रामनवारामण वाल, इलाहाबाद।
5. जयनारायण कौलिक, हिंदी शिक्षण, हरियाणा साहित्य अकादमी, चंडीगढ़।
6. जयनारायण कौलिक एवं बवमिा कौलिक, पाठ-रजीना निदेशिका हिंदी शिक्षण, आर्य युक्त डिपो, करोलबाग, नई दिल्ली।
7. जयनारायण कौलिक, भुक हिंदी लेखन, आर्य युक्त डिपो, करोलबाग, नई दिल्ली।
8. भगवती रसाद, हिंदी उच्चारण और वततनी, आयत युक्त डिपो, करोलबाग, नई दिल्ली।
9. भोरनाथ लतवारी, भाषा बवज्ञान, हकताि मिि, इलाहाबाद।
10. भोरनाथ लतवारी तथा कै िाि भाहटया, हिंदी शिक्षण, लिपी रकािन, नई दिल्ली।
11. योगेन्रजीत, हिंदी भाषा लिक्षण, बवनोद पुस्तक मंहदर, आगरा।
12. रघुनाथ सफाया, हिंदी शिक्षण, पंजाब किताब घर, जांच।
13. रमेश सरस्वती, हिंदी शिक्षण, रस्तोगी पत्रिका, भाजी।
14. रामशंकर पाणेय, हिंदी शिक्षण, विद्यालय पुस्तक मंडिर, आगरा।
15. वैद्यनाथ रसाद वमात, हिंदी शिक्षण, बवनोद पुस्तक मंडिर, आगरा।
16. लक्ष्मीनारायण शर्मा, भाषा की शिक्षण विभिन्न एवं पाठ-नियोजन, विद्यालय पुस्तक मंडिर, आगरा।
17. डेरार नारायण, विहार हिंदी ग्रन्थ अकादमी, पटना।
18. तीतराम चटुवर्डी, भाषा की शिक्षण, हिंदी साहित्य कुटी, भारतीय संस्थान।
19. साबविी लसंि, हिंदी शिक्षण, भारतीय संस्थान।
20. रामेश सरस्वती, हिंदी शिक्षण, बवनोद पुस्तक मंडिर, आगरा।
21. हरिदेव बहारी, व्यवहारिक हिन्दी व्यवस्था, लोक भारतीय प्रकाशन, इलाहाबाद।
13(iv): Pedagogy of Malayalam I – Part 2

Theory Credits 4

Essence of the course:
Malayalam is the medium for comprehending ideas, for reflection and thinking, as well as for expression and communication. This course deals Evolution of Malayalam Language, Historical development of Malayalam Literature, Language skill, curriculum development in Malayalam, Discourses in Malayalam, Methods of teaching Malayalam, Theories of learning with special reference to Malayalam teaching, Evaluation of learning Malayalam. This course is visualized as a range of language based activities, which will aid in strengthening the ability to 'read', 'think', 'discuss and communicate' as well as to 'write' in the language of instruction.

Objectives:
At the end of the course the student teachers will be able to
- enable the student teachers to acquire knowledge of the sound systems of Malayalam and to familiarize them with the appropriate terminology to describe the sounds in Malayalam.
- enable the student teachers to understand correct Malayalam usage and to acquire good pronunciation and fluency of speech.
- familiarize student teachers with the school syllabuses related to high school classes.
- help student teachers acquire a working knowledge of the grammatical terminology and the grammatical system in Malayalam.
- develop in the student teachers the ability to write in an appropriate manner for a particular purpose with a particular audience in mind.
- realize the significance of teaching Communicative Malayalam.
- develop their skill in curriculum transaction.
- develop a thorough understanding of the conceptual background of Malayalam.
- improve the understanding of the principles of curriculum construction and organization in Malayalam language.

CONTENT OUTLINE

Unit 1: Methods of teaching Malayalam
Lecture cum Demonstration method - Inductive and Deductive method - Dalton Plan - Project method - Play way method - Role play and simulation - Co-operative and collaborative strategies - Problem solving method.

Unit 2: Theories of learning with special reference to Malayalam teaching
Theory and practice of: Cognitive constructivism (Piaget and Bruner) and Social constructivism - Chomsky’s concept of language development - Multiple intelligence - Critical Pedagogy - Recent changes practiced in the state schools

Unit 3: Content Analysis
Pedagogic Analysis - Meaning and steps of analysis - Pedagogic analysis of the lessons in the text book of 8th, 9th & 10th standards.
Unit 4: Evaluation of learning Malayalam

Importance of evaluation - Different types of evaluation – merits and limitations - Continuous and comprehensive evaluation – Area of CCE - Evaluation criterion for different learning activities - Construction and administration of achievement tests - Evaluation of mental processes - Relevance and administration of grading system.

Unit 5: Models of Teaching

Meaningful verbal learning model – Gagne’s hierarchical model – Information processing model – Concept attainment model – New trends and approaches in language learning – Behaviourism, structuralism, cognitive interactionist approach, constructivism, multiple intelligence theory

Mode of Transaction:

Introductory lecture, Use of multimedia resources, Library resources, Dictionary and online referencing, Usage of Language games, Mind mapping, Demonstration, group discussions

Practicum: Task and Assignment

1. Prepare a short essay on inter relationship between language and social development. (group activity)
2. Open discussion on Mother tongue as a tool for transforming culture
3. Seminar (group) on Need of mother tongue as the medium of instruction
4. Seminar (group presentation)
5. Prepare short essay on 5 sub topics
6. Trace out the activities included in the Text book/Hand book for developing basic language skills among the learners
7. Find out the activities mentioned in the text book and hand book for developing the creativity among the learners.
8. Prepare essay on general principles of curriculum development.
9. Prepare an editorial for your class magazine
10. Prepare postures on any social issues
11. Write a screen play based on any one of the poems in the 8th or 9th std text book
12. Select a poem from any text book and present the same through simulation (group task)
13. Conduct a debate on the relevance of critical pedagogy in the context of the teaching-learning atmosphere prevailing in the schools in Kerala
14. Conduct a seminar on Chomsky’s concept of language development.
15. Analyse and trace out the learning activities included in any one topic on the basis of prescribed curricular objectives (Group task)
16. Analyse any one text book and Trace out new vocabulary, phrases, idioms, proverbs, and grammar contents (group task)
17. Conducts a panel discussion on the relevance of grading system in the B.Ed programme.
18. Prepare a sample question paper considering all the elements of a scientific question paper (group task)

Mode of Assessment

Written test and Task and assignment
References:
2. Damodaran Nair, P – ApasabdaNighantu
3. Sankarakurup, G – SahithyaParichayam
4. Parameswaran Nair, P.K – Malayala Sahithya Charithram
5. Raghavan Payyanad – Folklore
6. Balasahithyam Thatawum Charithravum – State Institute of Children Literature
27. SCERT (2007), Kerala Curriculum Frame work. Trivandrum: SCERT
13(v): Pedagogy of Telugu I – Part 2

Theory

Credits 4

Essence of the course:
Objectives:

CONTENT OUTLINE

Mode of Transaction
Practicum: Task and Assignment
Mode of Assessment
References:

Syllabus yet to be prepared for Pedagogy of Telugu I – Part 2.
Essence of the course:

This course is to enable students to specialize in teaching French as a foreign language and to develop an understanding of the modern day teaching approaches to teach grammar, vocabulary and pronunciation. The course includes analysis of teaching content and text books.

Objectives:

At the end of the course, the student teacher will be able to:

- understand the basic theories of learning and communication
- understand different approaches of teaching FLE/FLES
- acquire knowledge of various techniques in teaching oral and written skills
- prepare unit plan and activity oriented Lesson plans
- apply the theoretical concepts in classroom teaching
- develop the positive attitude among the students
- stimulate curiosity and creativity

CONTENT OUTLINE

Unit 1: Revision of Teaching content (Pronunciation) & Teaching of Pronunciation

Revision of teaching content:
Voyelles et consonnes – Division des syllabes - Liaisons et enchainements
*Prescribed book: Phonétique progressive du français – Niveau débutant et intermédiaire*

Teaching of pronunciation
Différence entre phonétique et phonologie – Méthodes de correction phonétique - Transcription phonétique
*Prescribed book: La phonétique audition, prononciation, correction*

Unit 2: Lesson plan preparation

Définition et rôle du plan de cours – Conseils méthodologiques pour préparer les leçons

Unit 3: Detailed analysis of following text books

Mauger bleu / C’est génial / Echo / Saison

Unit 4: Creation of teaching aids


Unit 5: Methodology of class observation

Méthodologie de l’observation de classe – Elaborer une fiche d’observation - Critères d’observation – Grille d’observation

Mode of Transaction

Lecturing on theoretical concepts, Project method, Tasks and Assignments.
Practicum: Task and assignment

1. Practice minimum 3 Micro teaching skills and maintain the record.(Compulsory)
2. Seminar on foundation and significance of French language teaching
3. Oral Communication tasks
4. Language Lab activities
5. Preparation of micro lesson plan
6. Preparation of micro lesson plan using computer assisted instruction
7. Sessions in small or medium groups
8. Language games on grammatical structure
10. Project on formation of new words
11. Planning of 10 vocabulary building exercises and techniques to teach the students in the classroom.
12. Assignments & Library work
13. Preparation of audio visual aids(PPT, Charts, Models)
14. Listening to radio news and responding to questions.

Mode of Assessment

Paper-pencil tests, Performance tests, Formal and Informal Testing

References:

1. ABRY D., VELDEMAN-ABRY J. La phonétique : audition, prononciation, correction, CLE, 2007, 1CD
6. OLLIVIER JACQUELINE et BEAUDOIN MARTIN, Grammaire française, 5e édition, Montréal, Groupe Modulo,
8. TAGLIANTE., CHRISTINE., La classe de langue, coll, Techniques de classe, CLE international, 2006
13(vii): Pedagogy of Mathematics I – Part 2

**Essence of the course:**
This course is to enable student teachers to specialize in mathematics teaching to develop an understanding of the curriculum and linking school knowledge with community life. The course includes reconstruction of mathematical knowledge through appropriate pedagogic processes and to communicate meaningfully with students.

**Objectives:**
At the end of the course, the student teacher will be able to
- appreciate the nature, structure, scope of Mathematics and its relation with other disciplines.
- acquire knowledge of the nature and development of Mathematics
- understand the aims and objectives of teaching Mathematics
- prepare unit plan and activities oriented Lesson plans for effective classroom communications.
- prepare the prospective Mathematics teachers as facilitators for effective teaching and learning of Mathematics.
- apply different methods and techniques of teaching of Mathematics and to employ them proficiently in the classroom
- develop the positive attitude among the student in teaching Mathematics
- appreciate the role of Mathematics in day-to-day life
- stimulate curiosity, creativity and inventiveness in Mathematics

**COURSE CONTENT**

**Unit 1: Lesson plan preparation**
Lesson planning – Meaning, Purpose, Components and Characteristics - types - needs -aspects of a good lesson plan –different models/approaches for writing lesson plan – Unit Plan, Year Plan.

**Unit 2: Models of Teaching Mathematics**

**Unit 3: Learning Resources and diverse classroom**

**Unit 4: Professional development of Mathematics teacher**
in Mathematics Education – Participation in conferences/Seminars/Workshops -Qualities of a Mathematics Teacher.

**Unit 5: Research in Mathematics teaching**

Research in the field of mathematics and mathematics teaching – status of achievement in mathematics at elementary and secondary schools – areas of difficulties – phobia for and attitude toward mathematics learning – factors related to mathematics learning – Action research – implication of research findings

**Modes of Transactions:**


**Practicum: Task and Assignment**

1. Collection of articles relevant to recent developments in Mathematics.
2. Prepare a lesson plan for any topic in Mathematics based on Inquiry Training Model or Concept Attainment Model.
3. Preparation of ten frames of Linear or Branching Programmes on any topic in Mathematics.

**Learning Activities:**

Learning the Content and practicing them appropriately, Oral work, drill, Review and Practising Pedagogical Aspects for different areas of School Curriculum.

**Mode of Assessment:**


**References:**

13(viii): Pedagogy of Physical Science I – Part 2

Essence of the course:
The student-teachers will revisit basic concepts of physics and chemistry which was given in upper primary and secondary school books. The student-teachers will work with such theoretical studies as well as on the field with school children from different backgrounds, they will capable to critically examine teaching learning processes that incorporate enquiry, discovery, conceptual development, activity based learning, etc. within the classroom.

Objectives:
At the end of the course, the student teacher will be able to
- acquire knowledge of nature, values and modern approaches in physical science teaching.
- understand learning objectives and curriculum approaches in physical science teaching.
- apply acquired knowledge of various methods and technique in teaching physical science.
- develop skill in adopting various approaches of learning in physical science teaching.
- develop interest in participating the practice teaching.
- develop desirable positive attitude towards contribution of eminent scientist for development of physics and chemistry.
- acquire hands-on experience in designing and developing suitable learning aids for classroom instruction.

COURSE CONTENT

Unit 1: Lesson planning
Lesson planning – meaning, need – Factors that need to be considered for organisation of concepts – Elements of a physical science lesson – different models/approaches for writing lesson plan – aspects of a good lesson plan – Unit planning – salient features

Unit 2: Methods and techniques of teaching physical science

Unit 3: Approaches in learning physical science
5E learning model – Collaborative learning approach – Problem solving approach – Concept mapping – Experiential learning – Cognitive conflict – Inquiry approach – Analogy strategy

Unit 4: Basic physics
Matter and Measurement: Measurement, Measuring Instruments
Forces and Movement: Motion, Force and Pressure, Motion and liquids, Laws of Motion and Gravitation

Unit 5: Basics Chemistry
Matter: Separation of Substances, Matter in our Surroundings, Elements, Compounds
Exploring Chemical Changes and Formulation: Changes around us, Matter and Its Nature, Chemical equation, Chemical Reactions
Exploring Chemical Families: Periodic Classification of Elements

Mode of transaction:
Lecture-demonstration method, Project method, Problem-solving method, CAI, Observation method (field visit/exhibition/internship), Seminar/discussion

Practicum: Task and Assignment
1. Critically analyze different branches of physics and chemistry are available in the school book from class 6 to 10th (Assignment).
2. Study the gender gap in learning science (scholastic record).
3. Observe classroom teaching methods and techniques used by the school teacher (Report).
4. Prepare 2 concept maps physics and chemistry each from the content.(concept map)
5. Prepare liner or branching frames for a single concept from physical science.(PI)

Mode of Assessment:
Written test, Task and assignment, Laboratory work

References:
9. Central Board of Secondary Education. (2010), Manual for Teachers on School Based Assessment Classes VI to VIII. Delhi.
13(ix): Pedagogy of Biological Science I – Part 2

Essence of the course:
This course is intending to enhance the ability and skill of the student teacher in understanding the importance of science and its relevance to the existence of life in this earth and to teach the same with different Techniques and approaches to the students of science learner. The student teacher will be acquainted with such steps involved in planning the science teaching and implementing the different methods and techniques in teaching of the same and further direct himself to do research. Further it helps him to develop desirable positive attitude towards science teaching and its development.

Objectives:
At the end of the course, the student teacher will be able to
- Understand the nature of science and aims and objectives of teaching Biological Science.
- Understand the microteaching skills
- Acquiring skills related in planning the lessons and presenting them effectively.
- Develop a theoretical and practical understanding of the various methods and techniques of teaching Biological Science.
- Understand the criteria in selecting a good textbook and to evaluate Science textbook.
- Understand the techniques of evaluating Science teaching and to construct an achievement test to assess the learning outcomes of pupils.
- Estimate the facilities required for the organization and maintenance of Science laboratory.
- Understand the special qualities of a Science teacher and to acquire those qualities.
- Understand the basic concepts in science for science teaching.
- Acquire a favourable scientific temper towards science teaching and values.
- Develops favourable positive attitude towards research on science teaching.

CONTENT OUTLINE

Unit 1: Organizing science related activities
Science club – Field trips/Excursions – Science Fairs/Exhibitions – Science hobbies – educational values

Unit 2: Methods of teaching biological science

Unit 3: Facilitating Individual learning strategies
Individualization of instruction – Programmed Instruction-linear and branching type-Computer Assisted Instruction. – Role of Multimedia in teaching biological science.

Unit 4: Lesson plan
Lesson Planning – Essential features of Lesson Planning – Steps in Lesson Planning –Preparing Lesson Plan – different models/approaches for writing lesson plan - Unit Plan - Steps in Unit Planning
Unit 5: Content and pedagogical analysis
Analyze the content in science books for standard VI to IX from lesson plan point of view and Concretization of concepts – pedagogical analaysis of selected concepts for learning.

Modes of transaction:
Lecture method, Assignment Method, Report writing, Field visit & Preparation of Field report, Laboratory Method, Presentation by students, Demonstration of scientific experiments.

Practicum: Task and Assignment
1. Preparation of three lesson plans on any topic of Biological Science included in the Science text book of secondary / Hr. secondary school science subject.
2. Preparation of blue print for construction of achievement test.
3. Preparation of unit test for a unit in Biology.
4. During your internship programme, observe the normal class and report that Methods and techniques of teaching Biological I science used by the school teacher.
5. Select one or two topic from upper primary or secondary biology syllabus – identify the learning difficulties – suggest suitable remedial measures.

Mode of Assessment:

References:
7. Central Board of Secondary Education. (2010), Manual for Teachers on School Based Assessment Classes VI to VIII. Delhi.
22. UNESCO: Mordern Trends in Teaching Biological Sciences Vols III.

Web resources:
3. https://conbio.org/professional-development/education-programs
13(x): Pedagogy of Social Science I – Part 2

Theory Credits 4

Essence of the course:
This course sensitizes the learners the relevance of social science in the current context. It makes them familiar about the techniques and approaches of teaching social science. This course acquaints the preparation and administration of learning resources in the meaningful way. It develops the competency in making use of appropriate assessment system to apprise the learning outcomes. It also sensitizes the learners about the various social issues and mould them to face the same in a plausible way.

Objectives
At the end of the course, the student teacher will be able to
- acquire basic knowledge and skills to analyze and transact the Social Science curriculum effectively following wide-ranging teaching
- acquire a conceptual understanding on the process of teaching and learning Social Science
- sensitise and equip student teachers to handle social issues and concerns in a responsible manner.
- Develop ability for critical and logical thinking and apply the acquired knowledge and skills in unfamiliar situations
- Acquaint with different methods, approaches and techniques of teaching social science
- Develop ability to design different evaluation tools
- Develop practical skills for analyzing socio-economic, political and physical phenomena

CONTENT OUTLINE

Unit 1: Self-Instructional Modules in Social Science Teaching
Programmed learning – Linear and Branching programme – Computer Assisted Instruction – Group Directed Instructional Modules.

Unit 2: Technological Media in Social Science Teaching
Hardware and Software approach - Multimedia in social science teaching.

Unit 3: Evaluation of Teaching and Learning in Social Science
Importance of evaluation – tools and techniques of evaluation in social science – characteristics and criteria for the preparation of different objective test items, short answer and essay questions in Social Science - Preparation of an achievement test , Preparation of blue print, Diagnostic test and remedial teaching.

Unit 4: Supporting Devices of Social Science Teaching
Educational Excursion, Field Trips – Social Science laboratory – Social Science Class room – Museum – Social Science Library – utilization of community resources- Bringing community to the school-taking school to the community, Teaching of current affairs and social issues.

Unit 5: Pedagogical analysis of content in Social Science at Secondary level
Third Year  
Semester 6

Mode of Transaction
Lecture cum discussion, Dramatization, Field visit, Debate, Panel Discussion.

Practicum: Task and Assignment
1. A detailed report may be prepared after visiting the various institutions which are practicing innovative approach in transaction modalities
2. Organizing field trip to any one of the place of historical importance.
3. Newspaper analysis.

Mode of Assessment
Unit test, Project, Preparation of assignments, Preparation Teaching aids, Seminar Presentation.

References:
Essence of the course:

This course is to enable students to specialize in Computer science and to develop an understanding of the curriculum, linking school knowledge with community life. The course includes reconstruction of Computer Knowledge through appropriate pedagogic processes and to communicate meaningfully with children.

Objectives:

At the end of the course, the student teacher will be able to

- enable the student teachers acquire knowledge on Fundamentals of Computer.
- acquaint the student teachers with the aim of teaching computer science at various levels.
- help the students teachers in acquiring skills relating to planning lessons and presenting them effectively.
- familiarise the student teachers with the various methods of Teaching Computer Science.
- understand the Computer Science curriculum and various approaches.
- make the student teachers aware of the use of various instructional materials and aids in Teaching of Computer Science.
- enable the student teachers acquire knowledge on Computer Evaluation.

CONTENT OUTLINE

Unit 1: Instructional Aids

Unit 2: Curriculum in Computer Science
Introduction – Meaning – Definition – Principles of Curriculum development, Selection of content and organization of subject matter - Approaches to the organization of computer science curriculum: correlated approach, Integrated approach, Topical approach, Concentric or spiral approach, Chronological and sequential approach - Present status of Computer Science in Secondary and Senior secondary education

Unit 3: Computer Organization
Unit 4: Text Books, Assignment and Review


Unit 5: Evaluation in Teaching of Computer Science


Mode of Transaction

Lecturing on Theoretical Concepts, use of computers in lab, Analytic and Synthetic Methods of Teaching, Project Method, Tasks and Assignments

Practicum: task and assignment

1. Practice minimum 3 Micro teaching skills and maintain the record.(Compulsory)
2. Prepare digital lesson plan
3. Conduct Online Quizzes or E-Quizzes
4. Prepare E-Content (any two topics)
5. Develop a CAI Package (Using Visual Basic Programming)
6. Prepare any two E-assignments
7. Prepare Program Learning Material

Mode of Assessment

Written tests, task and assignments.

References:

14(i): Pedagogy of Tamil II – Part 2

தமிழ் கற்பிக்கும் முறைகள் II – பகுதி 2

கற்பிக்கும் முறைகள் II – பகுதி 2

உணர்ந்து அறதப் பயன்படும் திருப்போர்.

கற்பிக்கும் முறையில் கூறுகறை அையச் மெய்தல்.

கற்பித்தல் முறையில் பரிவென்ப்படும் கற்பித்தல்.

கற்பித்தல் மதோழில் நுட்பக் கருவி பயின்படுத்துவித்தல்.

அைகு 1: தமிழ் பயிற்றுமுறைகள்

பண்றையகோை திறரயில் அறமயும் கருவி முக்கியத்துவம் – மதோறைக்காட்டு வழிக் கறைல் – மதோறைக்கும் வழிகள் – என்றமகள் – தமிழ் பயிற்றுமுறை அருகிய முறையிடல் வழியாகவும் மதோல்திட்டுப் பயிற்றுவிக்கும் முறையை அளிக்கும்.

அைகு 2: தமிழ் கற்பித்தல் திறரயில் அருகிய முறைகள்

சுத்தக்கமை - சுத்த்துறந்து - சுத்த்போட்டத் கற்பித்தல் - சுத்த்துறந்து - சுத்த்போட்டத் கற்பித்தல் - சுத்த்துறந்து - சுத்த்போட்டத் கற்பித்தல் - சுத்த்துறந்து - சுத்த்போட்டத் கற்பித்தல் - சுத்த்துறந்து - சுத்த்போட்டத் கற்பித்தல் - சுத்த்துறந்து - சுத்த்போட்டத் கற்பித்தல் - சுத்த்துறந்து - சுத்த்போட்டத் கற்பித்தல் - சுத்த்துறந்து - சுத்த்போட்டத் கற்பித்தல் -
Education Syllabus – Pondicherry University


Year: 3rd

Module: 4

1. Tamil

Module: 5

1. Tamil

References:

1. C. V. Ramakrishna, P. B. Sivasubramaniam. Tamil, Sonaitham.
12(ii): Pedagogy of English II – Part 2

**Essence of the course:**
Equipping the student with English knowledge for communication and Literature for appreciation. Developing the skill of communication in order to help children at various school levels towards effective communication. The course focuses on developing the ability of the future teachers to transact language in inclusive classroom.

**Objectives:**
At the end of the course, the student teacher will be able to
- develop English Language teaching competency.
- understand and appreciate the importance of English.
- have a critical study of learning English as a second language in the multilingual Indian Society.
- understand the role of English in India and to improve English Language attainment.
- produce the different methods, techniques and strategies of ELT.
- Prepare and use appropriate teaching aids to make teaching more effective.
- develop the various micro skills to teach English language.
- acquire the skill of preparing lesson plans to teach English.

**CONTENT OUTLINE**

**Unit 1: Lesson Plan format- Prose**
Planning of the lesson – Need, Features and Advantages of lesson plan – different models/approaches for writing lesson plan – Planning a Prose Lesson (Herbartian steps) - aims and objectives of teaching Prose-Identifying and listing language material to be taught (New lexical items and structures).

**Unit 2: Lesson plan format-Poem**
Concept, aims and objectives of teaching poetry in second language – Poetic devices-Difference between prose and poetry teaching- Steps of preparing a lesson plan on poetry.

**Unit 3: Technology resources for English language teaching**
Concept and use of A.V. aids in the teaching of English: Black board and white board, flannel board, bulletin board, flash cards, posters and flip charts, video clips, pictures, photos, puppets, postcards and advertisements, newspapers, brochures, Realia. Over Head Projector (OHP), Radio, T.V., role of computers, Power point presentation, Language laboratory and language games.

**Unit 4: Skill of listening**
Concept of listening in second language-Listening skills and their sub-skills -Techniques of teaching listening - Role of teaching aids in teaching listening skills - Difference between hearing and listening.

**Unit 5: Teaching of receptive skills - skill of reading**

**Mode of Transaction:**

Use of multimedia resources, Library resources, Accessing Online input on the topic, Print versions of texts focusing on communication, Usage of ICT, Introductory lecture, Micro-teaching through video lessons, Lesson Plan preparation, Demonstration, Mind mapping, Small group discussions, Dictionary and Online referencing, Language Lab activities

**Practicum: Task and assignment**
1. Project on formation of new words
2. Planning of 10 vocabulary building exercises and techniques to teach the students in the classroom.
3. Assignments & Library work
4. Preparation of audio visual aids(PPT, Charts, Models)
5. Listening to radio news and responding to questions.

**Mode of Assessment:**

Evaluation based on documentation (written) – Address the level of pupil involvement in Group Discussion – Performance evaluation (seminar, project and assignment) – Monitor the ability to distinguish between similar concepts – Use of Checklist to monitor, rate performance in each skill – Monitoring performance of communicative tasks

**References:**
15. Françoise Grellet. (1986) Developing reading skills, CUB.
पद्धति: 
राष्ट्रीय पाद्यविद्यालय 2005 तथा शिक्षा का अधिकार एक्ट 2009 विभागीय शिक्षा तथा शिक्षण प्रशिक्षण के निर्देश संबंधी को ध्यान में रखते हुए शिक्षकों को भूमिका में एक बहुत बड़ी पारंपरिकता को मौजूद करता है। पाद्यविद्यालय में अभी तक शिक्षकों को ही जाने के लिए रूप में केंद्रीय ध्यान मिलता रहा है, जब सीखने-सिखाने की सम्पूर्ण प्रक्रिया के संरचना और प्रबंधन के रूप में मुख्य भूमिका निभाने का काम करते हैं। पर 2005 की स्कूली पाद्यविद्यालय उसमें मौजूद करता है कि वे सुचारू के वितरित और जाने के रूप में बनने के रहे बल्कि विभागित द्वारा जाने हासिल करने की प्रक्रिया में स्वयं को सहायक माने। इन सब परिवर्तनों को उनके व्यवहार का हिस्सा बनाने के लिए जरूरी है कि अध्यापक शिक्षा के पाद्यक के परिवर्तन आए। विभागीय शिक्षा व्यवस्था में परिवर्तन के पहले तथा संबंध है जब इस व्यवस्था से जुड़े लोगों को सोच और उन्नयन में परिवर्तन आए और शिक्षक की भूमिका इस व्यवस्था में सबसे महत्वपूर्ण है। इस बीच में भाषा-शिक्षण का पाद्यक और भी महत्वपूर्ण हो जाता है, क्योंकि भाषा पूरी शिक्षा का आधार निर्माण का काम करता है, जहाँ सबसे भाषा पद्धति-सीखना बहुत महत्वपूर्ण भाषा के द्वारा अर्थ विषयों में भी नियुक्ति प्राप्त करने की बात आती है। इसके साथ ही भाषा से जुड़े नए बिनुद्वा. जैसे – व्यक्तियों का अवस्था, समाज का माध्यम, शारीरिक शिक्षा में भाषा की भूमिका आदि की समझ शिक्षक के लिए जरूरी है जो अध्यापक की भूमिका को मौजूद करते है।

वर्तमान पाद्यक भाषा के नए सरोकारों और सीखने-सिखाने की नई दृष्टियों को ध्यान में रखकर तैयार किया गया है। आशा है कि शिक्षक प्रशिक्षणाधीनों को इससे भाषा-शिक्षण के तैयारी में सहायता मिलेगी।

पाद्यक के विशेष झेले 
- भाषा के अलग-अलग भूमिकाओं का जानना 
- भाषा सीखने को सुजातन प्रक्रिया का जानना 
- भाषा के स्वरूप और व्यवस्था को समझना 
- स्कूल की भाषा, चर्च के भाषा और समाज के बीच के संबंध को जानना 
- भाषा के संवर्धन में बढ़ने के अधिकार, शारीरिक और बालिका के रूप पर संदर्भ होना 
- भाषा सीखने के तरीकों और प्रक्रियाएं को जानना और समझना 
- पाद्यविद्यालयों, पाद्यक और पाद्यपुस्तक का विलेखन कर कहीं विशेष और बच्चों को समझ के अनुसार दालना 
- भाषा और साहित्य के संबंध का जानना 
- हिंदी भाषा के विद्वान और अभिव्यक्तियों को जानना 
- भाषा और विचारों का स्वतंत्र अभिव्यक्ति रूप 
- भाषात्मक कारखानों के प्रति संवेदनशीलता होना 
- अनुसंधान के महत्व और भूमिका को जानना 
- विभागितों की सुजातन अवस्था को पहचानना 
- चर्च के भाषाओं के विकास के प्रति संवेदनशील और उसे समझने और लेखा होने के लिए विद्यालय में तरह-तरह के मौके जुटाना 
- भाषा के मूल्यवंत के प्रति अवस्था को जानना 
- साहित्यिक और गैर साहित्यिक मौलिक रचनाओं को समझ और समझना 
- भाषा सीखने-सिखाने के सुजातन उपकरण को समझना 

इक्काई 1: भाषा-समृद्धि के व्यक्तिकी अवस्थाओं का शिक्षण 
हिंदी भाषा में रस, छंद, अलापकार का महत्व – हिंदी भाषा में सन्न्यास, समाज तथा व्यक्तिकी चिंताओं का महत्व – विभाग व्यक्तिकी अवस्थाओं के शिक्षण में अपनायी जाने वाली साधनाओं – हिंदी साहित्य की विभिन्न विचारों की संभावना, इतक – हिंदी शिक्षण में मुहावरे और लोकबोध को उपयोग करें
Third Year

Semester 6

इकाई 2: हिंदी साहित्य में भावाभिव्यक्ति के विभिन्न माध्यम
समारकीय एवं समालोचक के नाम पत्र – प्रहसन, नाटक, तुक, नटक, कवि गोष्टी एवं साहित्यिक गोष्टी – रिपोर्ट एवं
कार्यक्रम – अन्तर्भाषी, शास्त्र विवाद एवं संवाद, तृत्य – कहानी, लघुनाटक एवं एकल अभिनय

इकाई 3: समालोचना एवं इसकी शिक्षा
समालोचना का महत्व एवं स्वरूप – भारतीय समालोचना शास्त्र का विकास – समालोचना के एक कौशल के रूप में –
वर्तमान हिंदी साहित्य के समालोचक – समालोचक के अंपीक्षत गुण – रीति एवं शैली के सन्दर्भ में

इकाई 4:
अहिंदी भाषी शैक्षणिक रूपों में अभ्ययता विद्यार्थियों के लिए सफल हिंदी शिक्षण की चुनौतियों – संक्षेप अलक – हिंदी –
एक राज्यभाषा – हिंदी – एक राज्यभाषा – राज्यभाषा को दृष्टि से भारत के विभिन्न ग्रामों का सूचीकरण –
संक्षेप झांकी – हिंदी की संवैचारिक प्रतिभा और राज्यभाषा के रूप में विकसित होने में आने वाली चुनौतियाँ

इकाई 5: हिंदी साहित्यकारो का संक्षेप विवरण
पुरातात्विक भारत में हिंदी साहित्यकार – ब्रिटिशकालीन भारत में हिंदी साहित्यकार – आधुनिक भारत में हिंदी
साहित्यकार – कुछ उम्मेदवार हिंदी साहित्यकार – साहित्यकारों के सम्पूर्ण उपर्युक्त सामाजिक चुनौतियाँ
(इकाई-10 में समाप्त इकायों के माध्यम से छात्राभाषा/ छात्राभाषा से अपेक्षा की जाती है कि वह हिंदी
साहित्यकारों का आधारभूत ज्ञान अवगत रखे)

Practicum: Task and Assignment
practicum activities relevant to the syllabus.

संदर्भ-प्रश्न
1. डा. विजयप्रत्य रेखी – हिंदी शिक्षण अन्य भाषा के संदर्भ में
2. कामसूत्र रूप गुरू – हिंदी व्यक्ति
3. डा. रामचंद्र वर्मा – अर्थी हिंदी
4. डा. नाथवर सिंह – आधुनिक साहित्य की प्रक्षेपण
5. डा.रामसान पाण्डेय – विविध साहित्यिक वाद
6. डा.लक्ष्मीनारायण शर्मा – देशनारी शिपी और वर्तनी
7. डा.रुद्राक्ष सरफ़ा – हिंदी संपादन
8. डा.रामदेव पी. कपूरिया – सूक्ष्म निर्माण
9. केंद्रीय हिंदी संस्थान के प्रकाशन – 1. हिंदी का वैश्विन्द व्यक्ति
2. देशनारी लेखन तथा हिंदी वर्तनी व्यवस्था
3. हिंदी शिक्षण विविध आयाम
4. हिंदी शिक्षण आंतरराष्ट्रीय परिपक्ष
5. हिंदी भाषा शिक्षण में अभिनवित अभिनव की दृष्टिकोण
6. भाषा शिक्षण तथा भाषा विज्ञान
14(iv): Pedagogy of Malayalam II – Part 2

Theory

Essence of the course:
This course equipping the student teacher with Malayalam knowledge for communication and its values for appreciation. It helps to prepare and use the various teaching aids in learning of Malayalam. It also develops the skill of communication in order to help children at various school levels towards effective communication. The course focuses on developing the ability of the future teachers to transact language in inclusive classroom.

Objectives:
At the end of the course, the student teacher will be able to
- develop positive attitude towards mother tongue (Malayalam), the rich and vivid culture of Kerala, Arts of Kerala and Folklore etc.
- develop the five basic skills such as reception, expression, creative ability, aesthetic sense and productivity.
- develop linguistic abilities – vocabulary sentence pattern, proverbs, idioms, grammatical structure etc.
- develop an insight into the historical and contemporary relationship with other Dravidian languages, Indo-Aryan languages.
- acquaint the trainee with advanced development in the theory relating to the teaching of mother tongue.
- acquaint the trainee with some of modern methods, techniques, procedures in teaching mother tongue.
- help the student to improve his professional competency and consciousness as a language teacher.
- acquaint the trainee with the use of different teaching aids, materials and media used in language teaching.
- develop computer skill in curriculum transaction.

Unit 1: Educational technology used for learning Malayalam
Computerized instruction, stimulation in teaching, micro teaching - Listening – various listening activities – hearing – visual impressions – radio, speech, film, television, pictures, charts etc. How to prepare children for listening – importance of listening – basis of language learning - Oral work – importance of oral work as basis of language learning – social and cultural importance – the value of subconscious comprehension before speech.

Unit 2: preparation and use of various learning aids in Malayalam
Unit 3: Organizing and maintaining library, language lab and other resources in Malayalam
Importance of library in language learning - Types of library - Organisation of classroom library and school library - Techniques of library utilization in language learning - Relevance of language lab.

Unit 4: appreciating poems, short stories and other forms of literature
Importance of reciting poems in the language classroom - Importance of analyzing symbols, images, rhetoric, tunes etc. used in poems - Importance of analyzing symbols, images, rhetoric, etc. used in stories for the appreciation.

Unit 5: Grammar, Poetic metre and Figures of speech
Parts of speech – Tense – Gender – Number – Case - Sentence structures - Language poetic composition (10) - Use of various poetics (10)

Mode of Transaction
Dialogue, seminars, discussions, and group-work

Practicum: Task and Assignment
1. Prepares a collage on any relevant subject.
2. Prepare two journal articles reviews from popular journals of Malayalam.
3. Prepare a list of 10 books with all bibliographic details.
4. Collects folksongs with similar tunes of poems in the text book and recite in groups.
5. Analyse the language, images, rhetoric and symbols used in any short story/Poem.
6. Prepare a note on teacher directs grammar & prosody.

Mode of assessment:
Written test and Task and assignment

References:
2. Damodaran Nair. P – Apasabda Nighantu
4. Parameswaran Nair. P.K – Malayala Sahithya Charithram
5. Raghavan Payyanad – Folklore
6. Balasahithyam Thatwamum Charithravum – State Institute of Children Literature
14(v): Pedagogy of Telugu II – Part 2

Theory

Essence of the course:
Objectives:

CONTENT OUTLINE

Mode of Transaction
Practicum: Task and Assignment
Mode of Assessment
References:

Syllabus yet to be prepared for Pedagogy of Telugu II – Part 2

14(vi): Pedagogy of Mathematics II – Part 2

The same syllabus as given in course -13(vii)

14(vii): Pedagogy of Physical Science II– Part 2

The same syllabus as given in course -13(viii)

14(viii): Pedagogy of Biological Science II – Part 2

The same syllabus as given in course -13(ix)
Edn 15: PE - CREATING AN INCLUSIVE SCHOOL

Essence of the course:

This course covers the concept of special schools, mainstreaming and inclusion, national policies, initiatives, programmes and acts for inclusive education, nature and needs of the children having disabilities and their integration.

The objectives of this course is to highlight and reinforce a firm belief in positive and varied outcomes of inclusion. It will help student teachers in identification of factors affecting learning and participation while formulating a policy of good practice and review. This course focus on the understanding of integrating children with special needs with the normal children.

Objectives:
At the end of the course, the student teacher will be able to
- acquire knowledge of terms and concepts used in disability and inclusion
- understand integrate education and the importance of inclusive school for disabilities and assessment methods
- apply the policies and practices related to special education and Service programme for the disabled
- develop the skills a dynamic approach of pupil diversity and opportunities for enriching learning among the disability child
- develop interest on support and active participation of all in the field of inclusive education
- develop the attitude towards students to interrogate their own beliefs and also of school teacher from social point of view.

CONTENT OUTLINE

Unit 1: Historical and modern perspectives on Inclusion
Meaning, definition – Characteristics of special education – History of special education - scope of special Education – principles of special Education – teacher’s role in special Education– factors affecting inclusion- present situation of special Education in India

Unit 2: Policy and programme for Inclusive Education

Unit 3: Different Learners in Inclusive Education
Types of learning disability: – physical- visual impaired, hearing impaired, Orthopaedic – Mentally impaired – Learning disability – Dyslexia, Dyscalculia, Dysgraphia – Attention deficit hyperactive disorder (ADHD ) – Autism – cerebral palsy
Fourth Year

Unit 4: Identification and Inclusion

Unit 5: Mainstreaming and integrated Education
Meaning – characteristics of integrated education - Equality and quality of integrated education – sustainable practice - create positive and innovative outcome - Safeguarding the needs of pupils with special educational needs - Assessment methods for inclusive school – Norm reference tests (NRT) and Criterion reference tests (CRT) – Behavioural and Clinical assessment – continuous and comprehensive assessment.

Mode of transaction:
Lecture, Discussion, Assignment, Visit special school, Film show

Practicum: Task and Assignment
1. Make a survey and write a report based on disability learner’s status in your nearby schools
2. Study the attitude of parents and teachers as inclusive
3. Visit to inclusive school to observe classroom interaction of anyone such schools in your area.
4. Case study of one/two people with special needs in secondary
5. Preparation of teaching aids for children having any one type of disability

Mode of Assessment:
Oral test, Case study, Special school Report, Written test, Task and assignment

References:
Edn 16: C&PS - ASSESSMENT FOR LEARNING – I

**Theory**

**Essence of the course:**

The course is designed keeping in mind the role of assessment in enhancing learning. It will focus on various tools and techniques of evaluation. There will also be focus on continuous and comprehensive evaluation. The course will also deal with critical understanding of issues in assessment and also explore realistic, comprehensive and dynamic assessment process. The course will also give emphasis on the need for formative and summative evaluation as well as quantitative and qualitative assessment for learning.

**Objectives:**

At the end of the course, the student teacher will be able to

- acquire basic concepts in assessment and evaluation.
- develop the awareness about different areas of assessment.
- discriminate different perspectives in assessment.
- develop understanding about the meaning and the process of CCE
- know different techniques of evaluation, tools of evaluation and their uses.
- know different characteristics of instruments of evaluation.
- discriminate teacher made test vs standardized tests in assessment
- prepare, administer and interpret of results of tests and different evaluation techniques
- compute simple statistics to assess the learning.
- develop awareness about use of technology in assessment and evaluation.

**COURSE CONTENT**

**Unit 1: Basics of Educational Testing, Measurement, Assessment and Evaluation**


**Unit 2: Different domains/areas of learning**

Educational objectives in different domains – cognitive, affective and psychomotor – Learning outcomes as behavioural changes – Relationship between educational objectives, learning experiences and evaluation – writing educational objectives-different kinds like knowledge, understanding, application, skill, affect attributes, behavioural terms and level of performance – Measurable and non-measurable learning outcomes.

**Unit 3: Traditional and constructivist assessment**

Traditional assessment – constructivist assessment– difference – traditional and constructivist teacher – Purposes of assessment in a 'constructivist' paradigm: to engage with learners' minds in order to further learning in various dimensions – Assessment for learning and assessment of learning; relative merits and demerits – Assessment of different types of content – Achievement, Performance, Values, Attitude and Aptitude. – Assessment for different purposes – Placement, Diagnosis and Grading
Unit 4: Continuous and Comprehensive Evaluation
Aim, objective and characteristics of CCE – Continuous and Comprehensive Evaluation (CCE)–Scholastic area– Co-Scholastic area – functions of continuous and comprehensive evaluation– Recording and reporting: measurement of students’ achievements, grading system and type – importance of progress report – Feedback as an essential component of assessment

Unit 5: Major tools of Evaluation and their uses
Paper pencil tests, Oral tests, and Performance tests – Achievement tests : standardized and teacher made tests – Diagnostic tests – Intelligence tests and aptitude tests – Rating scale – Check list – Anecdotal records – Socio-metric technique – Interview, Questionnaire and Inventory – Use of test data: placement, promotion, grouping, diagnosis and remediation. – Self reporting techniques/Reflection as assessment technique for learning. – Interview and focus group discussion

Mode of Transaction:
Lecture cum discussion, Seminar, Team Teaching, Practical work, Power point presentation

Practicum: Task and Assignment
1. Preparation, administration and interpretation of results of tests and different evaluation techniques
2. Writing educational objectives, learning experience and corresponding evaluation techniques, General and specific objectives
3. Framing measurable and non-measurable learning outcomes
4. Finding out the content validity of the given question paper
5. Designing Rating scale, Questionnaire, Interview Schedule in a given a topic
6. Framing Different types of questions
7. Preparation of Blue Print and a question paper
8. Prepare graphs and use statistics for analysis of test result
9. Preparation of interaction analysis report after the observation of any five teachers and peer teachers working in schools

Mode of Assessment:
Submission of Assignments, Preparation of tests various types of test items, Data collection and statistical analysis, Participation in Group discussion

References:
1. Assessment for Learning and Teaching in Primary Schools by Mary Briggs, Angela Woodfield, Peter Swatton
Edn 17: PE - SCHOOL MANAGEMENT – II

Theory

Essence of the course:
The focus of the course is on the essentials of school management and the challenges therein. This course is designed to throw light on the concepts of management related to School. The purpose is to foster proper understanding of these essential concepts and to create necessary managerial skills and capabilities among student teachers so as to enable them efficiently manage schools.

Objectives:
At the end of the course, the student teacher will be able to
- Understand the basic concepts of school management.
- Understand different components of school management
- Realize the multifaceted role of teacher/head teacher.
- Sensitize the student teachers about the concept of child rights in the process of School Management.
- Explain the factors contributing to the success of supervision and to acquaint with the modern trends in Supervision and Inspection.
- Discuss the present examination system and suggest some innovations.

CONTENT OUTLINE

Unit 1: Community & School

Unit 2: Child Rights and School Management

Unit 3: Co-Curricular Activities
Meaning, Importance of Co-curricular activities - Organisation of Co-curricular activities: School Assembly, Debates, Discussions, Seminars, Symposia, Cultural Activities, Scouts & Guides, National Green Corps, Physical Education Activities

Unit 4: Inspection and Supervision
Need and Importance of Supervision and Inspection - Meaning, Aims & Scope of Inspection and Supervision - New Trends in Supervision and Inspection - Principles of Good Supervision - Qualities and duties of effective supervisor.

Unit 5: Latest Trends & Innovations in School Management
School Complex - Village Education Committees - School based in-service programme - centrally sponsored Schemes, Sarva Siksha Abhiyan [SSA], RMSA- Use of Computers in School Management - Action Research in School Management: Concept, Importance, Steps
Mode of Transaction:
Lecture, Discussion, Project work, Field visits, Assignment, Seminar, Workshop, etc

Practicum: Task and Assignment
1. Analysis of working of PTA/School Education Committees/ School-Community Interactions
2. Observe and record the leadership styles of any five heads of the school and present them to the class for reflection.
3. Prepare a programme for parent’s meetings in a school.
4. Assume you are the head of the school; how will you manage the human resource of your school. Report it in your class and record the reflections.
5. If you want to become a creative headmaster rather than to be a status qua head master. Record an expected positive and negative problems

Mode of Assessment:
Written test, task and assignment.

References:
4. A New Approach to School Management - Dr. M.S. Sachdeva
5. Administration of Education in India - P.D. Shukla
9. Educational Administration, Supervision and School Management
11. Guidance of Sarva Siksha Abhiyan, M.H.R.D., Govt. of India
12. Modern Approach to School Organisation and Administration - Dr. M.S. Sachdeva
13. School Education and Management - Vijaya Kumari Kaushik, Sharma S.R.
14. School Organisation and Administration - Dr. K.S. Sidhu
15. Secondary School Administration - S.K. Kochhar
16. Teacher Education: Principles, Theories and practices
17. Teachers Role, Status, Service Conditions and Education in India (Doaba House)
18(i): Pedagogy of Tamil I – Part 3

தமிழ் கற்பிக்கும் முறைகள் I – Part 3

அடிப்பறைக் ககோட்போடு மமோழிபோைத்தில் கறைத்திட்ை வைர்ச்ெிக்கோன கூறுகறைக் கற்ைைிந்து அறவ மதோைர்போன அைிறவப் மபற்ைிருப்பர். இக்கோை இக்கியங்கறையும் இக்கோை இக்கணங்கறையும் அைிறவப் மங்கோள்வர்...
Fourth Year

Semester 7

போர்றவமெய்முறைமதிப்பீடுகற்பிக்கும்

4. பண்போட்டுபக்தவசெை
5. இரோம. 2006. ன்னூல், ஆோரதோ பதிப்பகம், மென்றன.
6. கவலூர்
7. கொன்றிகிரோமம்
8. இைங்ககோவன், மு. 2009. இறணயம் கற்கபோம். வயல் மவைி
9. பதிப்பகம்.

எடுத்தல்

எணுர்விகள்

1. குருதன்
2. மெய்திவோெிக்கப்போம்
3. அைித்தல்
4. இரோம
5. பைல்கள்

பாதுகாப்புப் படிப்பிகள்

1. நிகழ்வோய் பதோத்தியோர் Z. சமகதூகதிகள்.
2. பொழுதைத்தியால்
3. பாதுகாப்புப் படிப்பிகள்
4. லோகூதட்டு
5. பாதுகாப்பு பதோத்தியோர்

பாதுகாப்பு படிப்பிகள்

1. பாதுகாப்பு பதோத்தியோர் (ப. 2009. மலருெிய வழிக்கும்
2. மெோற்மபோழிவு
3. கணினி வழிக்கும்
4. மென்றன
5. புதுச்கெரி

பாதுகாப்பு படிப்பிகள்

1. மென்றன
2. புதுச்கெரி
3. புதுச்கெரி
4. புதுச்கெரி
5. புதுச்கெரி

பாதுகாப்பு படிப்பிகள்

1. குருதன்
2. மெய்திவோெிக்கப்போம்
3. மெய்தித்தோள்கைில் முறைகள்
4. நிகழ்வோய்
5. பாதுகாப்பு பதோத்தியோர்

பாதுகாப்பு படிப்பிகள்

1. குருதன்
2. மெய்திவோெிக்கப்போம்
3. அைித்தல்
4. இரோம
5. பைல்கள்
18(ii): Pedagogy of English I – Part 3

Essence of the course:
To have qualitative improvement in English language teaching the present course is designed. The English teacher should have strong content knowledge and also methodology of teaching in English. This teaching of English at the school level is given a very high importance in the globalization of process of education and economics. The fluency in English is helping the school student get employment opportunities as well as for further academic courses. Teacher as a facilitator helps learners to construct their knowledge. The teacher should be able to participate meaningfully to transact the syllabus and textbooks effectively along with teaching– learning materials. Therefore, the student teacher should be well-versed not only with the subject content but also with the pedagogy of learning. This course is visualized as a range of language based activities, which will aid in strengthening the ability to 'read', 'think', ‘discuss and communicate' as well as to 'write' in the language of instruction.

Objectives:
At the end of the course, the student teacher will be able to
- acquire knowledge of current trends in teaching of English
- acquaint with the techniques of oral presentation and practice of language items.
- understand the structure of English language and components skills
- improve proficiency level in using-English for utilitarian purposes
- familiarize student teachers with the text book contents related to high school and Higher Secondary classes.
- acquire good pronunciation and fluency of speech
- help student teachers acquire a working knowledge of the grammatical terminology and the grammatical system in English.
- develop the writing skill of the trainees.
- analyze the units of English text book of 8 & 9th standard.
- acquaint with the preparation of various learning aids in English.

CONTENT OUTLINE

Unit 1: Analysis of English text book and question paper
Comparative study of a text book of English from any class of state board - Detailed analysis of Course book of class 8th or 9th - Analysis of question paper of class 8th or 9th in light of content requirement and in terms of understanding and skills.

Unit 2: Advanced Grammar II
The sentence connection – Devices for cohesion and coherence. Concepts-different ways in which various concepts are expressed – modal, auxiliaries and other expression, commands, instructions, suggestions, prohibition, permission, probability and likelihood, possibility, necessary, purpose and result, cause reason, comparison and contrast conditions and supposition.

Unit 3: Reference and study skills in English
Unit 4: Words and expressions
Figures of Speech – Idioms and Phrases – Idioms derived from nouns and adjectives – the same words used as different parts of speech – words confused and misused.

Unit 5: Analyses of Errors in English
Analysis of grammatical errors - Common mistakes/Error in spelling, pronunciation, speaking, reading and writing, Causes and types of errors- remedial measures.

Mode of Transaction:
Discussion, Lecture, Demonstration of content analysis, Demonstration of teaching specific, grammar items, Seminar on different expressions, Narration, anecdotes of great personalities, Web based resources, Use of flash cards, Presentation of common errors through illustrations, Situation based error identification, Presentation of translation work

Practicum: Task and Assignment
1. Practicing extensive reading passages-Practicing the oral skills in pair and small group situation-Narrating stories with proper voice, modulation, compereering, presentation of views- Short speeches on topics of day to day relevance for gaining fluency / confidence.
2. Practice in spoken English – stress, rhythm and intonation
3. Preparation of Teaching Aids for speech sounds.

Mode of assessment
Analysis of Group discussion, Assessment of expressing ideas and thoughts through suitable examples, Monitoring performance of communicative tasks, Evaluation based on documentation (written), Performance evaluation(Seminar, Assignment &Project), Feedback

References:
18(iii): Pedagogy of Hindi I – Part 3

पृष्ठभूमि:
राष्ट्रीय पादर्शकांपूर्ति 2005 तथा शिक्षा का अधिकार एक 2009 विभागीय शिक्षा तथा शिक्षण प्रशिक्षण के निरीक्ष संबंध.
को ध्यान म. रखते हुए, शिक्षक. को भूमिका मे एक बहुत बड़े परिवर्तन को मौग करती है। पादर्शकां मे भरी तक शिक्षकां
को ही जान के स्रोत के रूप मे कंटेंट रखना मिलता रहा है, वह सीखने-सिखाने की समस्ती प्रक्रिया के संरचन और प्रबंधन के
रूप मे मुख्य भूमिका निभाने का काम करते आये है। यह 2005 की स्कूली पादर्शकां उसमे मौग करती है कि वे सूची के द्वितीय और जान के स्रोत बन कर न रहे बलि विश्लेषिकों द्वारा जान हासिल करने की प्रक्रिया मे स्वयं को
सहायक माने। इन सब परिवर्तनों को उनके व्यवहार का हिस्सा बनाने के लिए जरूरी है कि अध्यापक शिक्षा के पादर्शक मे
परिवर्तन आए। विश्लेषियों शिक्षा व्यवस्था मे परिवर्तन को पहल तथा संबंध है जब इस व्यवस्था मे जुड़े लोगों को सच्च और
पुष्टिकों मे परिवर्तन आए और शिक्षक को भूमिका इस व्यवस्था मे सबसे महत्वपूर्ण है। इस पुस्तिके से भाषा-शिक्षण का
पादर्शक और भी महत्वपूर्ण हो जाता है, क्योंकि भाषा पूरी शिक्षा की आधारित का काम करती है, जहाँ सबसे भाषा
पहुँच-सीखना नहीं बलि भाषा के द्वारा अन्य विषयों मे भी निपटाता प्राप्त करने को वात आती है। इसके साथ ही भाषा
से जुड़े नए विद्युआ. जैसे - भव्याभाविक कक्षा, समय का माध्यम, शास्ति के लिए भाषा की भूमिका आदि की समझ
शिक्षक. के लिए जरूरी है जो अध्यापक शिक्षा मे व्यापक बदलाव को मौग करते है।

वर्तमान शिक्षक भाषा के नए सरोकारों और सीखने-सिखाने को नई दृष्टियों को ध्यान मे रखकर तैयार किया गया है। आशा
है कि शिक्षक प्रशिक्षणार्थियों को इससे भाषा-शिक्षण का तैयारी मे सहायता मिलेगी।

पादर्शक के विशेष उद्देश्य
- भाषा को अलग-अलग भूमिकाओं को जानना
- भाषा सीखने को सुमान्तक प्रक्रिया को जानना
- भाषा के स्वरूप और व्यवहार को समझना
- स्कूल की भाषा, बच्चों की भाषा और समझ के बीच के संबंध को जानना
- भाषा के संबंध मे पहुँचे के अधिकार, शास्ति और परिवर्तन के प्रति संबंध होना
- भाषा सीखने के तरीके और प्रक्रिया को जानना और समझना
- पादर्शकों, पादर्शक और पादर्शतृस्का का विश्लेषण तर कक्षा विश्लेष और बच्चो को समझ के अनुसार दालना
- भाषा और साहित्य के संबंध को जानना
- ब्रिटिश भाषा के विपर्यय रोगों और अभिव्यक्तियों को जानना
- भाषा और विचारो का स्वरूप अभिव्यक्ति करना
- भाषात्मक बारोकियों के प्रति संदर्भसंग तो जानना
- अनुवाद के महत्व और भूमिका को जानना
- विभाजित को सुनामात्मक अभिव्यक्ति को पहचानना
- बच्चों के भाषात्मक विकास के प्रति समझ बनाना और उसे समुच्छत करने के लिए विभाग तथा तरह-तरह के मौके
जुड़ना
- भाषा के मूल्यांकन की प्रक्रिया को जानना
- साहित्यिक और गैर साहित्यिक मौलिक रचनाओं की समझ और सराहना
- भाषा सीखने-सिखाने के सुनामात्मक दृष्टिकोण को समझना

श्लौक 1: भाषा की भूमिका भाषा-साहित्य और सौदर्य - 1
(विभिन्न अभिव्यक्तियों भाषा की बारोकियों को जानने का सबसे अच्छा माध्यम है।)
Fourth Year

Semester 7

Sanskrit Bhāṣa के विविध रूप - साहित्य के विविध रूप को जानना, स्कूली पाठ्यक्रम में साहित्य को पढ़ना-पढ़ना, अनुवाद कला और सीखने में भाषा; स्कूली पाठ्यक्रम में मीडिया की भूमिका, ज्ञान प्राप्तिक्रम; अनुवाद का महत्व और जरूरत; सुन्दरस्क अभिव्यक्ति के रूप में हिंदी अनुवाद (अंग्रेजी और अन्य भारतीय भाषाओं के संदर्भ में) चुने हुए, उद्योग के आधार पर बनाया जाएगा।

इकाई 2: भाषा साहित्य और सीखने - 2
साहित्यिक अभिव्यक्ति के विविध रूप - कहावत को पढ़ना-पढ़ना; गद्दी की विविध विभाजन को पढ़ना-पढ़ना; नाटक को पढ़ना-पढ़ना; समकालीन साहित्य की पढ़ाई (बाल साहि, दलित साहित्य, संस्कृत साहित्य); हिंदी के विविध विभाजन के आधार पर गतिविधियों का निर्माण; कहावत, कहानी, नाटक, निबंध, उपन्यास की पाठ विधि तैयार करना।

इकाई 3: पाठ्यक्रम और पाठ्य-सामग्री का निर्माण और विशेषण (पाठ्यपत्रक शिक्षण का एक साधन है, एकमात्र साधन नहीं)
पाठ्यपत्रक और पाठ्यक्रम एक पाठ्य-सामग्री अनेक - पाठ्यपत्रक, पाठ्यक्रम तथा पाठ्यपुस्तकों का संबंध; पाठ्यक्रम के बच्चों के अनुसार दालना (शिक्षण को स्कूल वेक बाहरी जीवन से जोड़ते हुए तथा रंग-रंगाली का निर्माण करते हुए सामग्री चयन, गतिविधि और आवश्यक सामग्री का निर्माण), शोधकर्ता के रूप में शिक्षक (अलग-अलग बच्चों की आवश्यकताओं को ध्यान में रखते हुए)

इकाई 4: साहित्य शिक्षण सामग्री
पंक्ति मीडिया तथा अन्य पाठ्य सामग्री जैसे बच्चे द्वारा चुनी गई सामग्री, पत्रिकाएँ, अखबार, कहानी-पुस्तकालय आदि, आई.सी.टी. - दुर्गा - अभ्यास सामग्री, रेडियो, टेलीविजन फिल्में, भाषा प्रश्न-प्रश्नात्मक, सहसंस्कृतक गतिविधियों को रूपरेखा (चर्चा, वादविवाद, खेल, कार्यालयारे, गोत्र आदि)

इकाई 5: आयातन की भूमिका और महत्व (मुख्यकंड को भूमिका बच्चों की मौलिकता और भाषा उद्योग में उन्होंने सुन्दरस्कारक को पैना बनाना है।)
1. भाषा विकास की प्रगति का आकार - सत्ता और समस्त मूल्यांकन, स्वभाविक अभिव्यक्ति, अभिव्यक्ति मूल्यांकन, पौराणिक संस्कृतियों
2. प्रश्न का स्थान, प्रश्नों के आधार चित्र - समस्त सामाजिक संबंध प्रश्न, सुन्दरस्क चित्रण बाल्य प्रश्न, समाजसाधन चित्रण बाल्य प्रश्न, कल्पनाशीलता को जीवित करने बाल्य प्रश्न, परिवेशी समाज के बाल्य प्रश्न, गतिविधि और तारक (खुले प्रश्न, महत्वपूर्ण प्रश्न)
3. फीडबैक (विचारादि, अभिभावक और अभ्यास) और रिपोर्ट

प्रायोगिक कार्य
विवरणस्तर पर हिंदी की उपयुक्तता एवं उपयोगिता पर विचारगाथा - मीडिया एवं लेखन अभिव्यक्ति गतिविधियों - मूल्यांकन, लोकसत्ता, का प्रयोग करते हुए कहानी, लेख आदि लिखना - सिंहसनुद के अभ्यास - अंग्रेजी शिक्षण एवं धार्मिक गतिविधि बालने, प्रस्तुति लेखन, खोजने, पाठ होने, प्रश्न उठाने, बच्चन - पाठ्य पत्रिकाओं प्रस्तुतिकरण - दुर्गा-अभ्यास सामग्री का निर्माण - व्युत्पन्न, प्रश्न-प्रश्न, अंकों के साथ तथा प्रतियोगिता विशेषण - विशेष बल के प्रश्न तथा उपलब्धिक प्रश्न की संरचना - प्रश्नों आंकड़ा। का प्रस्तुति करणा - पाठ से संबंधित प्रायोगिक कार्य

मूल्यांकन के माध्यम
समूहीकरण चर्चा का विशेषण - स्व मूल्यांकन तथा निकट समूह मूल्यांकन - उपलब्धिक मूल्यांकन - अभिभावक एवं अभिव्यक्ति आधारित मूल्यांकन - प्रत्येक-अप्रत्येक सूचना आधारित मूल्यांकन
Fourth Year

Semester 7

संदर्भ-स्रोत

1. अनन्त चौधरी, नागरी लिपी और हिन्दी वर्तनी, विहार हिन्दी ग्रन्थ अकादमी, पटना।
2. के० क्षेत्रिया, भारतमभाषा शिक्षण, विलोक पुस्तक मंदिर, आगरा।
3. के० जी० रस्तोगी, भाषा सम्प्रदायी मूल्यांकन, केन्द्रीय हिन्दी संस्थान, आगरा।
4. के० के० सुबिन्दु, हिन्दी ध्वनियाँ और उनका शिक्षण, रामनारायण साहित्य संस्थान, इलाहाबाद।
5. जयनारायण कौलिक, हिन्दी शिक्षण, हरियाणा साहित्य अकादमी, चण्डीगढ़।
6. जयनारायण कौलिक एवं कैिाि भागवत, हिन्दी लिखित मूल्यांकन, केन्द्रीय हिन्दी संस्थान, इलाहाबाद।
7. भगवती रसाद, हिन्दी उच्चारण और वर्तनी, विलोक पुस्तक मंदिर, मेरठ।
8. भोिानाथ लतवारी, भाषा बवज्ञान, हकताि मिि, इिािािाद।
9. भोिानाथ लतवारी तथा कैिाि भागवत, हिन्दी शिक्षण, लिपी रकािन, हदली।
10. योगेन्रजीत, हिन्दी भाषा शिक्षण, बवनोद पुस्तक मंदिर, आगरा।
11. रघुनाथ सफाया, हिन्दी लिखित, पंजाब हकताि घर, जांधर।
12. रामिकि पांडेय, हिन्दी लिखित, बवनोद पुस्तक मंदिर, आगरा।
18(iv): Pedagogy of Malayalam I – Part 3

Essence of the course:
Malayalam is the medium for comprehending ideas, for reflection and thinking, as well as for expression and communication. This course deals with aims and objectives of teaching Malayalam. It includes activities for developing fluency in language, learning process and practical experience. It also opens a gateway to Malayalam literature with special reference to prominent contributors in the language.

Objectives:
At the end of the course, the student teacher will be able
- To understand the aims and objectives of teaching Malayalam
- To develop fluency and discourse oriented presentation
- To get acquainted with the student, learning process and acquire practical experience in creating conducive environment for effective learning
- To contribute to enrich Malayalam Literature.
- To understand Functional Malayalam
- To get acquainted with Planning of Instruction based on theories of Learning.
- To get acquainted with instruction based on Linguistics poetics, vocabulary, grammar and composition.
- To understand the principles of organizing curriculum
- To understand the techniques of using text books, Teachers hand books and other relevant materials for transacting language curriculum.

COURSE CONTENT

Unit 1: Aims and objectives of teaching Malayalam
Aims of Teaching Malayalam - Objectives of Teaching Malayalam at Secondary Level - Taxonomy of Educational Objectives and the objectives based on cognitive learning theories

Unit 2: developing fluency and discourse
Reading aloud prose passages and poems - Describing and interpreting pictures, tables, graphs, maps etc. - Telling stories and narrating incidents - Communication games - Dialogues and role play – Dramatization – Debates – Interviews - Extempore speeches on given topics.

Unit 3: learning process and practical experience
Physical, Psychological, Social and Emotional nature of the student - Peculiarities of learning activities - Specific peculiarities of language class - Nature of learning and learning strategies Role of teacher in the language class - Role of students in the language class - Techniques of creating conducive and democratic environment for learning - Qualities of a good learning activity - Appropriateness with the latest approach – interesting – Challenging – Feasibility - Sense of need - Considering multilevel of students.

Unit 4 Contributors to enrich Malayalam Literature
Unit 5: Influence of foreign language and Malayalam literature

The influence of Arabic – Malayalam in Malayalam Language and Literature - The influence of Arabic, Sanskrit, Hindi, Persian and Western Languages on Malayalam - Use of Scientific and Technical Words in Malayalam

Mode of Transaction:
Dialogue, seminars, discussions, and group-work

Practicum: Task and Assignment
1. Preparation of Aid for Teaching Malayalam speech sounds.
2. Review of any three novels and five short stories.
3. Creative writing-Dialogues, Expansion of ideas, paraphrasing, precise writing, verbs, short stories and letter writing.

Mode of assessment:
Written test and Task and assignment

References:
2. Damodaran Nair. P – Apasabda Nighantu
4. Parameswaran Nair. P.K – Malayala Sahitya Charithram
5. Raghavan Payyanad – Folklore
6. Balasahithyam Thatwavum Charithravum – State Institute of Children Literature
8. Raman Nair. K.P – Aksharalokavum Kavyakeliyum oru padanam
9. Iranjyam Ravi – Malayala Vyakaranakara Nighandu
10. Adhunika Bhasha Sastram – K.M. Prabakaravarior
11. Bhashayum Manasastravum – K.M. Prabakaravarior
15. Keralathinte Samskarika Charithram – Dr. P.K. Gopalakrishnan
Fourth Year

Semester 7

New York: Harkcourt, Brace &world, Inc.


18(v): Pedagogy of Telugu I – Part 3

Theory

Essence of the course:
Objectives:

CONTENT OUTLINE

Mode of Transaction
Practicum: Task and Assignment
Mode of Assessment
References:

Syllabus yet to be prepared for Pedagogy of Telugu I – Part 3.
18(vi): Pedagogy of French I – Part 3

Theory

Essence of the course:
Equipping the student with French knowledge for communication. Learning the different approaches to teach French at schools. Learning to use the ICT tools for education in foreign language classroom. The course focuses on developing the ability of the future teachers to transact language in inclusive classroom.

Objectives:
At the end of the course, the student teacher will be able to
- develop French Language teaching competency.
- understand and appreciate the importance of French.
- have a critical study of learning French as a second language in the multilingual Indian Society.
- understand the role of French in India and to improve French Language attainment.
- produce the different methods, techniques and strategies of teaching French.
- prepare and use appropriate teaching aids to make teaching more effective.
- develop the various micro skills to teach French language.
- acquire the skill of preparing lesson plans to teach French.

CONTENT OUTLINE

Unit 1: Foundation and importance of French language teaching
Enseignement du FLE (French as a foreign language), FLM (French as a mother tongue), FLS (French as second language), FOS (French for specific objectives). Importance d’apprendre le français dans le monde actuel.
(La classe de langue, p. 13-18)

Unit 2: Aims and objectives of teaching French as a second language
Buts de l’enseignement du français – Objectifs d’enseignement du FLE au niveau primaire, secondaire et au niveau lycée. Petite etude du terrain (étude sur le système d’enseignement du français en Inde)

Unit 3: Teaching skills

Unit 4: Planning of the lesson
Définition et rôle du plan de cours – Avantages d’élaborer un plan de cours - Conseils méthodologiques pour préparer les leçons

Unit 5: Methods of teaching French
Difference entre “Methode”, “Methodologie”, “Approche” and “Perspective”.
(Manuel de formation pratique: P. 74-75, La classe de langue: P.50-60, 63-65, 68-69)
Fourth Year

Semester 7

Mode of Transaction:
Use of multimedia resources, Library resources, Accessing Online input on the topic, Print versions of texts focusing on communication, Usage of ICT, Introductory lecture, Micro-teaching through video lessons, Lesson Plan preparation, Demonstration, Mind mapping, Small group discussions, Dictionary and Online referencing, Language Lab activities

Practicum: Task and assignment
1. Seminar on foundation and significance of English language teaching
2. Oral Communication tasks
3. Language Lab activities
4. Preparation of micro lesson plan
5. Preparation of micro lesson plan using computer assisted instruction
6. Sessions in small or medium groups

Mode of Assessment:
Evaluation based on documentation (written) – Address the level of pupil involvement in Group Discussion – Performance evaluation (seminar, project and assignment) – Monitor the ability to distinguish between similar concepts – Use of Checklist to monitor, rate performance in each skill – Monitoring performance of communicative tasks

References:
1. ABRY D., VELDEMAN-ABRY J. La phonétique: audition, prononciation, correction, CLE, 2007, 1CD
6. OLLIVIER JACQUELINE et BEAUDOIN MARTIN, Grammaire française, 5e édition, Montréal, Groupe Modulo,
8. TAGLIANTE., CHRISTINE., La classe de langue, coll, Techniques de classe, CLE international, 2006
18 (vii): Pedagogy of Mathematics I – Part 3  
Credit: 4

Essence of the course:
This course is to enable students to specialize in Mathematics and to develop an understanding of the curriculum, linking school knowledge with community life. The course includes reconstruction of Mathematical Knowledge through appropriate pedagogic processes and to communicate meaningfully with children.

Objectives:
At the end of the course, the student teacher will be able to
- acquire the knowledge of competence in teaching Mathematics
- develop clear perception of the Secondary School Mathematics.
- develop awareness of recent trends and principles of construction of Mathematics curriculum.
- know the importance of computers in teaching and learning of Mathematics
- understand the various psychological aspects involved in teaching Mathematics
- know the importance of aesthetic and recreational Mathematics
- develop an understanding of resources of teaching and learning Mathematics.
- help the student teacher for the professional self-development
- enable the student teachers to identify gifted and slow learners in Mathematics and to meet the requirements.
- stimulate to pose and solve meaningful problems and creativity in Mathematics.
- develop insight into individual differences in learning Mathematics to cater to the needs and requirements of students.
- develop skills in construction of appropriate assessment tools for evaluating Mathematics learning.

COURSE CONTENT

Unit 1: Revisiting of Content in Mathematics

Unit 2: Mathematics Curriculum

Unit 3: Planning and Designing Instruction in Mathematics
Planning Instruction- Need and Importance - Decision Making as the Basis for Planning - Concept of Pedagogic Content Knowledge (PCK) and Components of PCK - Pedagogic Content Knowledge Analysis for selected units in Mathematics at the secondary level in terms of Content, Pre-requisites, Instructional Objectives– Selecting suitable Teaching Methods and
Strategies, Techniques, Models, Learning Activities, Selecting suitable evaluation techniques, Identifying the misconceptions and appropriate remedial measures.

Unit 4: Learning Resources in Mathematics
Mathematics Text Book – Mathematics Library – Mathematics Club and Mathematics Exhibition

Unit 5: Psychological foundations of Mathematics Education
Jean Piaget’s Cognitive theory, Bruner’s Discovery learning, Gagne’s eight types of learning and Constructivism - Critical Analysis of Mathematics Curriculum at the secondary level (state board) based on principles and organization of Mathematics curriculum and NCF 2005.

Modes of Transactions:

Learning Activities:
Learning the Content and practicing them appropriately, Oral work, drill, Review and Practicing Pedagogical Aspects for different areas of School Curriculum.

Practicum: Task and Assignment
1. Critically analyze the Mathematics Curriculum at the Secondary Level and prepare a report.
2. Prepare any two improvised teaching aids.
3. Prepare the stick album based on the mathematical shapes
4. Search and collect the scrap for Mathematics
5. Prepare a power-point presentation on Mathematical Concepts, Principles and Properties.

Mode of Assessment:

References:
18(viii): Pedagogy of Physical Science I – Part 3

Essence of the course:
After having learning this Course, student teachers understand the nature of physical science teacher, the learner, resource material including ICT for teaching physical science and evaluation process. This course comprise, pedagogical approaches for organizing science related activities; and assessment of the learner.

The student-teachers will work with theoretical studies as well as on the field with school children from various backgrounds. They will capable to critically teach the science in their internship school and examine teaching learning processes also developing of self.

Objectives:
At the end of the course, the student teacher will be able to

- acquire knowledge about the term and concepts used in teaching physical science.
- understand nature of the learner and classroom situation.
- apply the knowledge in constructing test and developing ICT resource in teaching physical science.
- enhance skill in organizing and maintaining of physical science laboratory.
- create interest in organizing science related activities.
- develop a desirable positive attitude towards science teaching.

COURSE CONTENT

Unit 1: Pedagogical shift in Physical Science:
Pedagogical shift from science as fixed body of knowledge to the process of constructing knowledge – Critical pedagogy, democratising science learning and role of teachers – Pedagogical shift: planning teaching learning experiences.

Unit 2: Exploring Learners
Uniqueness in learner – Motivating learners to bring their previous knowledge into Classroom – Involving Learners in teaching-learning Process – Encouraging learners to raise and ask questions, collect materials from local resources.

Unit 3: Curriculum in Physical Science
Meaning – curriculum and syllabus – Principles and approaches of curriculum construction – selection of content –Recommendations of various commission since Kothari commission to NCF on science curriculum–Physical science syllabi and textbooks at upper primary, secondary stage.

Unit 4: ICT Resources in Learning Physical Science
Unit 5: Organizing Science Related Activities

Science libraries, science Museum, science club, science hobbies, field trips/excursions, science Fairs/exhibitions, Science corner.

Mode of transaction:
Lecture-demonstration method, Project method, Problem-solving method, CAI, Observation method (field visit/exhibition/internship), Seminar/ discussion

Practicum: Task and Assignment
1. During internship, analyze and record learning abilities of pupils and their activities in class situation (observation).
2. Study any one of 6th to 8th or 9th to 10th the science curriculum used in India (Report)
3. Surf the Internet for searching information for various concepts of physical sciences for primary/secondary/higher secondary stages. Review them and make a list of relevant websites that you would recommend to your students. Share and discuss about the websites with your friends and teacher (Discussion)
4. Write self-study report based on your visit to science exhibition or science centre (Visit).
5. Evaluate any 2 school science text book (Rating)

Mode of Assessment:
Written test, Task and assignment, Laboratory work, Observation

References:
9. Central Board of Secondary Education. (2010), Manual for Teachers on School Based Assessment Classes VI to VIII. Delhi.
Essence of the course:
This course will introduce the student teachers to know about the advanced methods of teaching the biological science and make them to acquaint to have knowledge about conduct of practical’s, critically examine teaching learning process based on activity and get insight about meta – learning. This course further seeks to be self-improving through the processes of reflection, feedback, and critical inquiry. Consequently, science teacher must help their students to understand their role within the broader social community.

Objectives:
At the end of the course, the student teachers will be able to
- acquire knowledge about Individual learning strategies
- understand approaches of learning Biological science.
- apply the knowledge in constructing test and developing ICT resource and professional development in teaching Biological science.
- develop skill in practical work and organizing and maintaining of biological science laboratory.
- develop interest in using teaching resources and research in science education.
- develop a desirable positive attitude towards. tools and techniques of assessment of learning biological science

COURSE CONTENT:
Unit 1: Approaches of learning Biological science

Unit 2: Community and learning resources
Learning resources from immediate environment – using community resources – Community based learning resources in teaching of science. – Field visit to botanical garden, Science Park and zoo - scientific Lab and its equipment

Unit 3: Teaching resources
Machine operated aids: Overhead projector, digital projector, smart interactive board.
Non–Machine operated aids:
Graphical aids: flash cards, charts, flip chart, graphs, pictures, poster, and cut–outs and its effective uses.
Display Board: chalkboard, bulletin, flannel, magnetic, peg board and its effective uses.
3D aids: objects, specimens, models.

Unit 4: Biology Laboratory
Location, planning, organization and maintenance-practical preparation – laboratory registers – safety in the lab – common accidents and first aid – practical ethics

Unit 5: Biology practical work
Organizing and importance of practical work – problems in conducting practical – guidelines for teachers, evaluation of practical work – practical record work in biology
Modes of transaction:
Lecture method, Assignment Method, Report writing, Field visit & Preparation of Field report, Laboratory Method, Presentation by students, Demonstration of scientific experiments.

Practicum: Task and Assignment
1. Report writing about finding resources on teaching science using web
2. Preparation of laboratory instructional cards.
3. Prepare any one working model related to bio-science.
4. Preparation of Posters / articles / stories related to science concepts / environment. (send it for publication at student journals)
5. Study and observation of how science is taught in various schools and prepare a report on teaching aids availability and show how it can be improvised further.

Mode of Assessment:

References:
3. Central Board of Secondary Education. (2010), Manual for Teachers on School Based Assessment Classes VI to VIII. Delhi.
18(x): Pedagogy of Social Science I – Part 3  

Theory Credits 4

**Essence of the course:**
This course helps to sensitize the learners the relevance of social science in the current context. It makes them familiar about the techniques and approaches of teaching social science. It helps the learner well acquaint the preparation and administration of learning resources in the meaningful way. It also develops the competency in making use of appropriate assessment system to apprise the learning outcomes. This course deals about the various social issues and mould them to face the same in a plausible way.

**Objectives:**
At the end of the course, the student teacher will be able to
- acquire basic knowledge and skills to analyse and transact the Social Science curriculum effectively following wide-ranging teaching
- acquire a conceptual understanding on the process of teaching and learning Social Science
- sensitise and equip student teachers to handle social issues and concerns in a responsible manner.
- Develop ability for critical and logical thinking and apply the acquired knowledge and skills in unfamiliar situations
- Acquaint with different methods, approaches and techniques of teaching social science
- Develop ability to design different evaluation tools
- Develop practical skills for analysing socio-economic, political and physical phenomena

**CONTENT OUTLINE**

**Unit 1: Curriculum of Social Science**

**Unit 2: Curriculum Reforms in Social Science**
Role of Teacher in curriculum implementation and evaluation; national policies of education – reforms in social science curriculum at the secondary education level, national curriculum framework for school education (NCERT)

**Unit 3: Approaches of curriculum construction**
Correlated, Integrated, Topical, Unit, Patch, Concentric, and Spiral approaches.

**Unit 4: Models of Teaching**
Jurisprudence Model of Inquiry, Concept Attainment Model, Asubel’s Advanced organiser model and its application in social science
Unit 5: Use of ICT in Social Science Teaching
Uses of Computer – Internet and Intranet – e-learning – Mobile learning.

Mode of Transaction
Lecture cum discussion, Problem Solving, Dramatization, Seminar, Field visit, Debate, Group Discussion.

Practicum: Task and Assignment
1. Analysis of any three years’ public examination social science questions papers and submission of report.
2. Discussion on Contemporary issues.
3. Organizing a Mock Parliament Session.

Mode of Assessment
Unit test, Project, Preparation of assignments, Assessment of Learning Resources, Seminar Presentation.

References:
10. UNESCO: New Source Book for Teaching of Geography, UNESCO
Essence of the course:

This course is to enable students to specialize in Computer science and to develop an understanding of the curriculum, linking school knowledge with community life. The course includes reconstruction of Computer Knowledge through appropriate pedagogic processes and to communicate meaningfully with children.

Objectives:

At the end of the course, the student teacher will be able to

- enable the student teachers acquire knowledge about Informational Communicational Technology in Education
- develop an understanding about the Internet and Its applications
- guide the student teachers about planning and maintaining the Computer laboratories
- familiarize the student teachers with the Modern Trends in Teaching of Computer Science
- enable the student teachers acquire knowledge about blended learning and its models
- familiarize the student teachers with the multimedia, web designing, and Computer programming

CONTENT OUTLINE

Unit 1: Information Communication Technology


Unit 2: Internet and its Applications


Unit 3: Planning and Maintenance of a Computer Laboratory


Unit 4: Modern Instructional Strategies

Unit 5: Blended learning perspectives


Mode of Transaction:
Lecturing on Theoretical Concepts, use of computers in lab, Analytic and Synthetic Methods of Teaching, Project Method, Tasks and Assignments

Practicum: Task and Assignment
1. Develop the Multimedia package (Any one lesson at secondary or senior secondary level)
2. Create an Educational Blog (Individually)
3. Draw the Computer based Concept maps
4. Prepare self-blended learning module
5. Write a C programme – Students Mark list using array
6. Create a simple website for your class (Upload: Assignment, Exam details, Study materials)
7. Organize the Team Teaching among student trainees
8. Prepare the rating scale for self- Assessment of student teachers (use during the teaching practice)

Mode of Assessment

References:
Edn 19: C&PS - PEDAGOGY OF SCHOOL SUBJECT II

19(i): Pedagogy of Tamil II – Part 3

**Theory**

**Credits**

4

**Edn 19 (i): Pedagogy of Tamil II – Part 3**

**Theory**

- Pedagogy of Tamil II – Part 3

**Credits**

4

- சுவாரசி பரம்பரைக் கற்பிக் கருவியுடன் முறையே மெய்யான அம்மோழியும்
- படைத்து மெய்யான அம்மோழியும்
- மெய்யான அம்மோழியும் வீழ்ச்சிக் முறையே
- மெய்யான அம்மோழியும்
- மெய்யான அம்மோழியும்
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**Lesson 1:**
- மெய்யான அம்மோழியும்
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**Lesson 2:**
- மெய்யான அம்மோழியும்
- மெய்யான அம்மோழியும்
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**Lesson 3:**
- மெய்யான அம்மோழியும்
- மெய்யான அம்மோழியும்
- மெய்யான அம்மோழியும்
- மெய்யான அம்மோழியும்
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**Lesson 4:**
- மெய்யான அம்மோழியும்
- மெய்யான அம்மோழியும்
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- மெய்யான அம்மோழியும்
- மெய்யான அம்மோழியும்
நூற்றாண்டு பட்டியல்

கல்விகளின் விளையாட்டு - வாழ்க்கை விளையாட்டு - விளையாட்டு வகைப்படுத்தல் - விளையாட்டு வகைப்படுத்தல், எளியாக விளையாட்டு - விளையாட்டு வகைப்படுத்தல், எளியாக விளையாட்டு - விளையாட்டு வகைப்படுத்தல் - விளையாட்டு வகைப்படுத்தல்.

முறைப்படி

வாழ்க்கை விளையாட்டு, வாழ்க்கை விளையாட்டு, குழுமக் விளையாட்டு, எளியாக விளையாட்டு, எளியாக விளையாட்டு, எளியாக விளையாட்டு.

மத்தியச் சபை பட்டியல்

1. வாழ்க்கை விளையாட்டு வகைப்படுத்தல்.
2. வாழ்க்கை வகைப்படுத்தல்.
3. வாழ்க்கை வகைப்படுத்தல்.
4. வாழ்க்கை வகைப்படுத்தல்.
5. வாழ்க்கை வகைப்படுத்தல்.

பாராட்டு வலைநூற்றாண்டு


பொருள்பாடு நூற்றாண்டு

19(ii): Pedagogy of English II – Part 3

Essence of the course:
Equipping the student teacher with English knowledge for communication and appreciation. Developing the skill of communication in order to help children at various school levels towards effective communication. The course focuses on developing the ability of the future Teachers to transact language in inclusive classroom.

Objectives:
At the end of the course, the student teacher will be able to
• enable the student teachers to
• develop English Language teaching competency.
• understand and appreciate the importance of English.
• have a critical study of learning English as a second language in the multilingual Indian Society.
• understand the role of English in India and to improve English Language attainment.
• produce the different methods, techniques and strategies of ELT.
• Prepare and use appropriate teaching aids to make teaching more effective.
• develop the various micro skills to teach English language.
• acquire the skill of preparing lesson plans to teach English.

CONTENT OUTLINE

Unit 1: Lesson plan format grammar
Planning for teaching Grammar and usage -Steps of preparing a lesson plan for grammar. – Types of grammar (Formal and Functional) - Methods of teaching grammar (Inductive and Deductive)

Unit 2: Lesson plan format - composition
Planning for teaching composition- Kinds of composition (Guided, Controlled and Free)-Steps of preparing a lesson plan for teaching composition-Correction of a composition work.

Unit 3: Approaches to teaching English language
Structural approach- Situational approach- Communicative approach- Eclectic approach- constructive approach- S-O-S approach.

Unit 4: Teaching pronunciation
Teaching Pronunciation and Spoken English. Standard Indian Pronunciation with reference to GIE/RP. - English sound system – Vowels, Consonants - Minimal contrasts – consonant clusters- Focusing on difficult sounds – comparison with sounds of Indian languages. Syllabification – stress, intonation, rhythm.

Unit 5: Teaching of vocabulary
Essentials of teaching vocabulary-Types of vocabulary – Active and passive; Content words and structural words- Selection and gradation of vocabulary -Teaching meaning of words - Expansion of vocabulary.
Mode of Transaction:
Demonstration of teaching specific grammar items, Seminar on different expressions, Comparative study of various forms of compositions, Demonstration of steps followed in different methods, Introductory lecture, Observation of video clips, Through Situational presentations, Usage of Language games, Presentation of good models by native speakers, Through language lab, Framing, evaluating and interpreting a question paper.

Practicum: Task and Assignment
1. Projects on methods of teaching grammar
2. Language games on grammatical structure
3. Activities & competitions for Creative writing,
4. Practicing Formal and Informal Letter
5. Perform any one of the activities for developing the language skill: Quiz, Debate, Dialogue, Role play, Brain storming

Mode of assessment:
Analysis of Group discussion, Participant Observation, Monitoring performance of communicative tasks, Evaluation based on documentation (written), Performance evaluation (Seminar, Assignment & Project)

References:
15. Françoise Grellet. (1986) Developing reading skills, CUB.
19(iii): Pedagogy of Hindi II – Part 3

पीढ़ी-पीढ़ी स्वयंप्रकरण राष्ट्रीय पादराय गैज-शिक्षक 2005 तथा शिक्षा का अधिकार एकट 2009 विश्वविद्यालयों शिक्षा तथा शिक्षण प्रशिक्षण के निर्देश संवर्धन को ध्यान म. रखते हुए, शिक्षकों को भूमिका में एक बहुत बड़े पारंपरिक को भूमिका करता है। पादराय राष्ट्रीय पादरायों अभी भी राष्ट्रीय पादरायों को ही जान उसे सेवा के रूप में केंद्रीय स्थान मिलता रहा है, वह सीखने-सिखाने की समूही शिक्षा के संरक्षक और प्रबंधक रूप में मुख्य भूमिका निभाने का काम करते आए है। पर 2005 को स्कूली पादराय उनसे मौजूद करता है कि वे शिक्षकों के विवरण और जान के संस्करण ने न रहे बल्कि विभागों द्वारा जान हासिल करने की प्रक्रिया में व्यवस्था को सहायक माने। इन सब परिवर्तनों को उनके व्यवहार का हिस्सा बनाने के लिए जरूरी है कि अध्यापक शिक्षा के पादराय में राष्ट्रीय पादरायों की पहल तथा संबंध है जब इस व्यवस्था में जुड़े लोगों को संचार और व्यवस्था में राष्ट्रीय पादराय और शिक्षक की भूमिका इस व्यवस्था में सबसे महत्वपूर्ण है। इस व्यवस्था में भाषा-शिक्षण का पादराय और भी महत्वपूर्ण हो जाता है, क्योंकि भाषा पूरी शिक्षा की आधारशिक्षा का काम करती है, जहाँ विभिन्न भाषा पद्धतियों में भाषा के द्वारा अन्य विषयों में भी निपटाना प्राप्त करने की व्यवस्थापन है। इससे साथ ही भाषा के जुड़े नए विकस. जैसे - व्याकरणिक कक्षा, समस्ता का माध्यम, शास्त्रीय शिक्षा में भाषा का भूमिका आदि की समझ शिक्षकों के लिए जरूरी है जो अध्यापक शिक्षा में व्यापक अवलोकन को मौजूद करते हैं।

पादराय के विषय उद्देश्य

- भाषा के अलग-अलग भूमिकाओं को जानना
- भाषा सीखने की युगान्ध स्थिति की जानना
- भाषा के स्थरुप और व्यवस्था की समझना
- स्कूल की भाषा, बच्चों की भाषा और समस्ता के बीच के संबंध का जानना
- भाषा के संदर्भ में पढ़ने के अधिकार, शारीरिक और व्यवहारकरण के प्रति सम्बन्ध होना
- भाषा सीखने के तरीकों और प्रक्रिया का जानना और समझना
- पादराय, पादराय और पादरायक का विशेषण कर कक्षा विशेष और बच्चों की समझ के अनुसार ढालना
- भाषा और साहित्य के संबंध को जानना
- हिंदी भाषा के विषय रूपों और अभिव्यक्तियों को जानना
- भाषा और विवरण की स्थिति अभिव्यक्ति करना
- भाषाओं के बारे में व्यवस्था की संबंधित करना
- अनुवाद के महत्व और भूमिका का जानना
- विभागों की स्थानान्तरक समय को पहचानना
- बच्चों का भाषात्मक विकास के प्रति समझ बनाना और उसे सम्बन्धित करने के लिए विवरण में तरह-तरह के मौजूदा जुटाना
- भाषा के मूल्यांकन की प्रक्रिया का जानना
- साहित्यिक और गैर-साहित्यिक मौलिक रचनाओं की समझ और सराहना
- भाषा सीखने-सिखाने के समस्तान्तरक टूटकोण का समझना

हकीकत 1:

(क) मातृभाषा और अन्य भाषाएँ। – (ख) मातृभाषा की महत्व और पादराय में उसका स्थान। – (ग) मातृभाषा शिक्षण के उद्देश्य। – (घ) अन्य भाषा का महत्व एवं अन्य भाषा शिक्षण के उद्देश्य। – (ड) विभाग गृह और उसका कार्यनिष्ठ। – (च) भाषा-शिक्षण के समायोजन सिद्धांतों का परिचय।
Fourth Year  
Semester 7

इकाई 2:
(क) भाषा के चार कौशल-श्रवण,भाषण,पठन,लेखन का समान्य ज्ञान एवं परिचय। — (ख) श्रवण कौशल शिक्षण। —
(ग) भाषा कौशल शिक्षण। — (घ) पठन(वाचन) कौशल शिक्षण। — (ङ) लेखन कौशल शिक्षण। — (च) भाषा अधिव्यवहार के दो रूप-मौखिक और लिखित। — (छ) उच्चवर्ग शिक्षण।

इकाई 3: हिंदी की लिपि और वर्तनी का परिचय
(क) देवनागरी लिपि का उद्भव और विकास। — (ख) देवनागरी लिपि की वैज्ञानिकता विशेषताएं तथा कमियाँ। —
(ग) वर्तनी का मानक रूप। — (घ) वर्तनी, वर्तनी के नियम वर्तनी संबंधी जुटियाँ के सुधार संबंधी उपाय।

इकाई 4:
(क) हिंदी भाषा का उद्भव और विकास तथा हिंदी की बोलियाँ। — (ख) संपर्क भाषा और राजभाषा के रूप में
हिंदी।

इकाई 5:
(क) भाषा शिक्षण में भाषा विज्ञान का योगदान। — (ख) व्यक्तिक शिक्षण। — (ग) रचना शिक्षण।

हिंदी की विभिन्न विषयों का शिक्षण
(क) कविता शिक्षण एवं पाठ कायम। — (ख) गद्य शिक्षण एवं पाठ कायम। — (ग) कहानी शिक्षण एवं पाठ कायम।
— (घ) नाटक शिक्षण एवं पाठ कायम। — (ङ) पत्र लेखन, निबंध लेखन, सार लेखन आदि का शिक्षण।

संदर्भ-पुस्तक
1. डा. विजयराम देवी — हिंदी शिक्षण अथ भाषा के संदर्भ में
2. कामता प्रसाद गुरु — हिंदी व्यक्तिक
3. डा. रामचंद्र वर्मा — अच्छी हिंदी
4. डा. नामवर सिंह — आधुनिक साहित्य की प्रवृत्तियाँ
5. डा.रामसजन पाण्डे — विविध साहित्यक वाद
6. डा.लक्ष्मीनारायण शर्मा — देवनागरी लिपि और वर्तनी
7. डा.पुनवाथ सफाया — हिंदी शिक्षण
8. डा.गमदेव पी. कसूरीया — सूक्ष्म शिक्षण
9. कृष्णदेव हिंदी संस्थान के प्रकाशन — 1. हिंदी का वैज्ञानिक व्यक्तिक
   2. देवनागरी लेखन तथा हिंदी वर्तनी व्यवस्था
   3. हिंदी शिक्षण विविध आयाम
   4. हिंदी शिक्षण अन्तराष्ट्रीय परिपक्वता
   5. दूसरी भाषा शिक्षण में अभिधित अधिग्रह की तैनाती
   6. भाषा शिक्षण तथा भाषा विज्ञान

Practicum: Task and Assignment
Minimum 2 activities relevant to the syllabus.
19(iv): Pedagogy of Malayalam II – Part 3

Essence of the course:
This course equipping the student teacher with Malayalam knowledge for communication and its values for appreciation. This course deals with Malayalam usage and society. Usage of ICT, research in Malayalam language, professional traits of Malayalam teachers are reflected. The course focuses on developing the ability of the future teachers to transact language in inclusive classroom.

Objectives
At the end of the course, the student teacher will be able to
• appreciate the role of Malayalam in the society
• familiarize the IT related professional inputs of teaching.
• understand the meaning, importance and concept of models of teaching in Malayalam language teaching.
• Use of Malayalam on Computers
• Apply phonetics of Malayalam
• Critical thinking and creative writing
• Know about action research
• be a professional Malayalam teacher.
• acquaint with the co-curricular activities in Malayalam.

CONTENT OUTLINE

Unit 1: Reading and Writing

Unit 2: Malayalam language and Society
Malayalam language and society, language and culture, Mother tongue and folklore, colloquial language and dialects - Community resources – Types and utilization.

Unit 3: ICT usages in Malayalam
Unit 4: Malayalam on computers

Unit 5: Phonetics of Malayalam
The different speech organs and their role - The individual sounds – vowels and consonants – their place and manner of articulation- Errors in pronunciation and the remedial measures to be employed- The text sentence connection – Devices for cohesion and coherence. The sentence – Types of sentences – Subordinate and co-ordinate clauses – Question forms – Analysis and classification of grammatical errors.

Mode of Transaction
Dialogue, seminars, discussions, and group-work

Practicum: Task and assignment
1. Prepare a newsletter on the topic Malayalam language in Kerala.
2. Prepare and presentation of a minimum 5 discourses in language class.
3. Prepare a collection of poems and stories of your choice.
4. Planning and Preparing of language games to teach grammar and vocabulary items.
5. Preparing instructional materials in teaching Malayalam.

Mode of assessment:
Written test and Task and assignment

References:
1. Sabdasodhini
2. Keralapaneeyem
3. Bhashabhooshanam
4. Malayalasaili
5. Vrithasilpam
6. Keralabhasahavijnaneeyam
7. Vrithavicharam
8. Kairaliyute Katha
9. The teaching of Mother tongue by W.M. Rhyburn
10. Malayalasahithaycharithram
11. Enthanu Blog? Blogging engane thudangam
12. Vijayam nedan social media.
bhasha institute.

17. SCERT (2007), Kerala Curriculum Framework. Trivandrum: SCERT
19(v): Pedagogy of Telugu II – Part 3

Theory

Essence of the course:
Objectives:

CONTENT OUTLINE

Mode of Transaction
Practicum: Task and Assignment
Mode of Assessment
References:

Syllabus yet to be prepared for Pedagogy of Telugu II – Part 3.

19(vi): Pedagogy of Mathematics II – Part 3
The same syllabus as given for course -18(vii)

19(vii): Pedagogy of Physical Science II – Part 3
The same syllabus as given for course – 18(viii)

19(viii): Pedagogy of Biological Science II – Part 3
The same syllabus as given for course – 18(ix)
Essence of the course:
The focus of the present course is on understanding the physical, mental fitness for healthy life. This course discourses the yogic exercise, health, and its importance. It also helps to understand the recent diseases and precaution.

Objectives:
At the end of the course, the student teacher will be able to
- create awareness on different aspects of health and fitness.
- acquire the knowledge of Yoga & exercises
- understand the physical fitness & Yoga.
- learn good health habits.
- develop total personality and suitable leadership
- enable student teacher organize physical activities

CONTENT OUTLINE

Unit 1: Yogic exercises

Unit 2: Yoga in daily life

Unit 3: Growth and requirements
**Human body:** Growth & development a children at different ages, their needs and interests, psychological development – Physical, emotional and mental changes during adolescence. **Sexual abuse:** Myths and misconceptions regarding growing up, Management of stress and strain and life skills. **Nutrition:** Dietary requirements needs according to age, sex – Need for diet planning: Food and water.

Unit 4: Communicable and Non-communicable diseases
Heart Diseases, Cancer, HIV/AIDS, Swine Flue, Reproductive Helpless Health, Osteoporosis, Depression, Intentional & Unintentional Injuries, Diabetes, and Obesity, Uncommon Diseases-Autistic, Cerebral Palsied, Blood Borne Diseases-Beta Thal Major, Sickle Cell Anemia, Hemophilia; Diagnosis, Prevention & Prognosis. Pollution: Types, Causes, effect and control of various pollution.

Unit 5: Health and sports
Fundamental skills of games & sports: Sports for recreation and competition, Rules and regulations of sports, Sports ethics, Sports awards and scholarships, Sports – personship –
Develop of physical fitness, Postures, Importance of relaxation, Health and physical education and its relationship with other the subject areas like science, social science & languages.

Mode of Transaction
Lecture, Discussion, Observation, Debate, Field visit, Project, poster presentation

Practicum: Task and Assignment
1. General guidelines for performance of the practice of yoga for the beginners
   1. Guidelines for the practice of kriyas
   2. Guidelines for the practice of asanas
   3. Guidelines for the practice of prāṇāyāma
   4. Guidelines for the practice of kriya yoga
   5. Guidelines for the practice of meditation
2. Project on health / Sports and Yoga
3. Organisation of games & sports
4. Visit sports stadium and report
5. Participating various games and discus all the games in class.
6. Health education and yoga – Analysing various topics by using various charts, photographs and other materials.
7. Surfing to know the different sport and games in India and report
8. Prepare the portfolio for Yoga and its advantages.
9. Make a sports album.

Mode of Assessment
Written test, Task and Assignment.

References:
3. Raja Yoga – Methods and practices – Dalmite
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


17. www.FalunDafa.org

Edn: EPC 7 - UNDERSTANDING SELF

Practicum

Credits 2

Essence of the course:
Most of us are neither aware of our strengths nor weaknesses. The focus of the present course is on understanding the self-physical, mental, emotional and spiritual. The course culminates into realization of the universal self. Various processes for understanding the self have also been specified.

Objectives:
At the end of the course, 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 the 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 Aṣṭaṅga yoga.
- State the different types of yoga.
- Derive how Haṭha yoga and Aṣṭaṅga yoga are complementary to each other.
- Name the śatākarma and describe their use in cleansing the body and the mind.
- Demonstrate some important āsanas, and prāṇayāma.

CONTENT OUTLINE

Unit 1: Self-concept

Unit 2: Professional identity of teacher
Sensibilities, dispositions, resilience and skills personal growth: communication skills ability to listen and observe – holistic and integrated understanding self and personality – Teambuilding, respecting, sharing responsibility – the change agent – designing and leading change /social action

Unit 3: Modes of expression
Opening self, reflection, self-expression: explore dreams, aspirations, concerns, including poetry and humour, creative movement, aesthetic representations – culture for listening and accepting through story making, self-disclosure, art, dance and theatre

Unit 4: Self-esteem and Identities of self
Unit 5: Meditation and Yoga enhance abilities of body and mind
Meditation and Yoga, meaning, practice and importance– Live in peace and harmony with one’s surroundings – promote sensibilities – appreciate the philosophy of yoga and its role – practice and use of yoga in different contexts

Mode of transaction
Lecture-cum-discussion, workshop sessions, assignments, presentations by students

Practicum: Task and Assignment
1. Sharing case studies/biographies/stories of different children who are raised in different circumstances and how this affected their sense of self and identity formation.
2. Watching a movie/documentary where the protagonist undergoes trials and finally discovers her/his potential despite odds.
3. Issues of contemporary adolescence/youth need to be taken up as student-teachers first need to understand themselves; and themselves in relation to their students and classroom situations.
4. Different modes of expression can be used in each of the sessions (so that each of the students get a chance to express herself through any of the modes that they are comfortable in) and at the end of the year, the resource person and the coordinating faculty can reflect back on whether all modes of expression were included through the sessions of not.
5. The exercise of developing reflective journals and providing regular feedback on those journals can also be used here
6. Workshop for development of the inner self and the professional identity as a teacher trainee
7. Programmes to develop social relation and effective communication skills
8. Team building to draw up collective strengths as an individual in society
9. Yoga and the practice of yoga

Mode of Assessment
Written test, Task and Assignment

References:
FOURTH YEAR - SEMESTER VIII
Edn 20: C&PS - PEDAGOGY OF SCHOOL SUBJECT I

20(i): Pedagogy of Tamil I – Part 4

Theory Credit

Semester VIII

Fourth Year

Pedagogy of Tamil I – Part 4

Credits 4

Semester VIII

Fourth Year

Pedagogy of Tamil I – Part 4

Credits 4

Semester VIII

Fourth Year

Pedagogy of Tamil I – Part 4

Credits 4

Semester VIII

Fourth Year

Pedagogy of Tamil I – Part 4

Credits 4

Semester VIII

Fourth Year

Pedagogy of Tamil I – Part 4

Credits 4

Semester VIII

Fourth Year

Pedagogy of Tamil I – Part 4

Credits 4

Semester VIII

Fourth Year

Pedagogy of Tamil I – Part 4

Credits 4

Semester VIII

Fourth Year

Pedagogy of Tamil I – Part 4

Credits 4

Semester VIII

Fourth Year

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Semester 8

மெய்முறைப் கற்பிக்கும்

1. குருதன் நூல்கள் மறுப்பிரியோ விளையோட்டுமுறைகள், வயாகத்து உதவியுள்ள விளையோட்டுமுறைகள் (கோந்தியம், மோர்க்கெியம், தைித்தியம், கணினி பயிற்சிகள்).
2. குருதன் நூல்கள் மறுப்பிரியோ விளையோட்டுமுறைகள், வயாகத்து உதவியுள்ள விளையோட்டுமுறைகள் (கோந்தியம், மோர்க்கெியம், தைித்தியம், கணினி பயிற்சிகள்).
3. குருதன் நூல்கள் மறுப்பிரியோ விளையோட்டுமுறைகள் (கோந்தியம், மோர்க்கெியம், தைித்தியம், கணினி பயிற்சிகள்).
4. பேருநல் விளையோட்டுமுறை, விளையோட்டுமுறைகள்

புதுரோச்சா முறைகள்:

1. குருதன் நூல்கள் மறுப்பிரியோ விளையோட்டுமுறைகள், வயாகத்து உதவியுள்ள விளையோட்டுமுறைகள் (கோந்தியம், மோர்க்கெியம், தைித்தியம், கணினி பயிற்சிகள்).
2. குருதன் நூல்கள் மறுப்பிரியோ விளையோட்டுமுறைகள், வயாகத்து உதவியுள்ள விளையோட்டு�ுறைகள் (கோந்தியம், மோர்க்கெியம், தைித்தியம், கணினி பயிற்சிகள்).
3. குருதன் நூல்கள் மறுப்பிரியோ விளையோட்டுமுறைகள் (கோந்தியம், மோர்க்கெியம், தைித்தியம், கணினி பயிற்சிகள்).
4. குருதன் நூல்கள் மறுப்பிரியோ விளையோட்டுமுறை, விளையோட்டுமுறைகள், விளையோட்டுமுறை, விளையோட்டுமுறை.
5. குருதன் நூல்கள், புதுரோச்சா 1991. குருதன் நூல்கள் மறுப்பிரியோ விளையோட்டுமுறை, விளையோட்டுமுறை, விளையோட்டுமுறை.
6. புதுரோச்சா புதுரோச்சா, புதுரோச்சா. புதுரோச்சா புதுரோச்சா, புதுரோச்சா.
7. புதுரோச்சா புதுரோச்சா, புதுரோச்சா. 2001 புதுரோச்சா புதுரோச்சா, புதுரோச்சா.
11. புதுரோச்சா, புதுரோச்சா.
12. புதுரோச்சா, புதுரோச்சா.
Essence of the course:
To have qualitative improvement in English language teaching the present course is designed. The English teacher should have strong content knowledge and also methodology of teaching in English. This teaching of English at the school level is given a very high importance in the globalization of process of education and economics. The fluency in English is helping the school student get employment opportunities as well as for further academic courses. Teacher as a facilitator helps learners to construct their knowledge. The teacher should be able to participate meaningfully to transact the syllabus and textbooks effectively along with teaching– learning materials. Therefore, the student teacher should be well-versed not only with the subject content but also with the pedagogy of learning. This course is visualized as a range of language based activities, which will aid in strengthening the ability to 'read', 'think', ‘discuss and communicate' as well as to 'write' in the language of instruction.

Objectives:
At the end of the course, the student teacher will be able to
- acquire knowledge of current trends in teaching of English
- acquaint with the techniques of oral presentation and practice of language items.
- understand the structure of English language and components skills
- improve proficiency level in using-English for utilitarian purposes
- familiarize student teachers with the text book contents related to high school and Higher Secondary classes.
- acquire good pronunciation and fluency of speech
- help student teachers acquire a working knowledge of the grammatical terminology and the grammatical system in English.
- develop the writing skill of the trainees.
- analyze the units of English text book of 8 & 9th standard.
- acquaint with the preparation of various learning aids in English.

CONTENT OUTLINE

Unit 1: Developing Fluency
Use of conventional formulae – greeting, apology, invitation, refusal, accepting, thanking – reading aloud prose passages and poems – describing and interpreting pictures, tables, graphs, maps etc. telling stories and narration incidents.

Unit 2: Communicative Activities
Communicative games, dialogues, role play, play reading, dramatization, debates, interviews, extempore speeches.

Unit 3: Language and literature
Unit 4: Language Translation
Translation as a creative activity: Importance and need - Translation tools - Analyze any one translation text into English from different Indian languages.

Unit 5: Media Perspective of Language
Print Media - Newspaper Language, Radio and TV language - Language of advertisement
Social Networking and Language - Educational scope of social networking sites (face book, twitter, you tube, what’s app) Blogging and E-Learning.

Mode of Transaction:
Discussion, Lecture, Demonstration of content analysis, Demonstration of teaching specific, grammar items, Seminar on different expressions, Narration, anecdotes of great personalities, Web based resources, Use of flash cards, Presentation of common errors through illustrations, Situation based error identification, Presentation of translation work

Practicum: Task and Assignment
1. Review of any one novel and two short stories.
2. Practice in black board sketches for the purpose of introducing new items.
3. Creative writing - Dialogues, Expansion of ideas, paraphrasing, precise writing, short stories and letter writing.
4. Report on the teaching of composition to the second language learners and suggest their weaknesses.

Mode of assessment
Analysis of Group discussion, Assessment of expressing ideas and thoughts through suitable examples, Monitoring performance of communicative tasks, Evaluation based on documentation (written), Performance evaluation (Seminar, Assignment &Project), Feedback

References:
पृष्ठभूमि:
राष्ट्रीय पादशिक्षकोपरियोजना 2005 तथा शिक्षा का अधिकार एक 2009 विद्वानगी शिक्षा तथा शिक्षण प्रशिक्षण के निकट संबंध.
को ध्यान म. रखते हुए, शिक्षकों का शैक्षिक मार्ग में एक बहुत बड़े परिवर्तन को मान करते हैं। पादशिक्षकों में अभी तक शिक्षकों।
को ही जन के स्रोत के रूप में केंद्रीय रूप से मिलता रहा है, यह सीखने-सिखने को समृद्ध शिक्षिका के संरक्षक और प्रबंधक.
के रूप में मुख्य भूमिका निभाने का काम करते आए हैं। पर 2005 की स्कूली पादशिक्षण उद्योग को मान करते हैं कि वे स्कूलों के विवरण और जान के स्रोत बन कर न रहे बिल्कुल विश्वासियों के बाद नाम करने की प्रक्रिया में स्वयं को सहायक माना। इन सब परिवर्तनों का उनके व्यवहार का हिस्सा बनाने के लिए जरूरी है कि अध्यापक शिक्षा के पादशिक्षण में.
विश्वासी शिक्षा व्यवस्था में परिवर्तन की पहल पूरी संस्थापन है जब इस व्यवस्था से जुड़े लोगों की संधि और
वृद्धावस्था में परिवर्तन आए और शिक्षक की भूमिका इस व्यवस्था में सबसे महत्वपूर्ण है। इस दृष्टि से भाषा-शिक्षण का विवरण और भी महत्वपूर्ण हो जाता है, क्योंकि भाषा पूरी शिक्षा का आधारभूत का काम करती है, जहाँ सिवं भाषा
पहुँ-सीखना नहीं बिल्कुल भाषा के द्वारा अन्य विषयों में भी निर्मुखता प्राप्त करने की बात आती है। इसके साथ ही भाषा
से जुड़े नए, विचार. जैसे - व्यक्तिगत कक्षा, समस्या का माध्यम, शारीर को शिक्षा में भाषा की भूमिका आदि की समझ को शिक्षका के लिए जरूरी है जो अध्यापक शिक्षा में व्यक्ति बदलाव को मान करते हैं।

terms & conditions

पादशिक्ष के विरोध उद्देश्य
- भाषा की अलग-अलग भूमिकाओं को जानना
- भाषा सीखने को सुजातनक प्रक्रिया को जानना
- भाषा के स्वरूप और व्यवस्था को समझना
- स्कूल की भाषा, बच्चों की भाषा और समझ के बीच के संबंध को जानना
- भाषा के संभंध में पहचान के अधिकार, शारीरिक और परिवर्तन के प्रति संबंध होना
- भाषा सीखने के तरीके के प्रक्रिया के जानना और उभयन
- पादशिक्षयों, पादशिक्ष कंत-पादशिक्षर का विश्लेषण कर कक्षा विशेष और बच्चों की समझ के अनुसार बालक
- भाषा और साहित्य के संबंध को जानना
- हिंदी भाषा के विवरण के और अभिव्यक्तियों को जानना
- भाषा और विचारों की स्वतंत्र अभिव्यक्ति करना
- भाषाय वारूदकर्ताओं के प्रति संबंधित होना
- अनुवाद के महत्व और भूमिका को जानना
- विवाहवीं को सूरजमुख श्रमिक का पहचानना
- बच्चों के भाषाय विकास के प्रति समझ बनाना और उसे समुच्छय करने के लिए विवाहवी में तरह-तरह के मूल
- भाषा के मूल्यांकन को प्रक्रिया को जानना
- साहित्यिक और जीवन साहित्यिक मौलिक रचनाओं को समझ और सराहना
- भाषा सीखने-सिखने के सुजातनक प्रक्रिया को समझना

उपर्युक्त तिथि से (एकांक, एकांक, पर्याय-पर्याय, विलोम)

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2. प्रयोग की दृष्टि से (सामाजिक, तकनीकी)

3. इतिहास की दृष्टि से (तात्विक, तद्भव, देशवास और विदेशी)

4. उपयोग, प्रयोग, संधि और समाज के अनुभवणार्‌ के तथा शब्द रचना म. उनकी भूमिका, उनके प्रकार और प्रयोग

इकाई 2: हिन्दी की सिद्धि और चर्चा का परिचय

1. देवनागरी लिपि का उद्भव और विकास

2. देवनागरी लिपि का वैज्ञानिकता, विश्लेषणात्मक तथा कामिंगीय

3. वर्णों का मानक रूप

4. चर्चा, चर्चा के नियम, चर्चा संबंधी उपयोग के सुधार संबंधी उपाय

इकाई 3: हिन्दी भाषा का उद्भव और विकास

1. संस्कृत भाषा, राजभाषा और राष्ट्रभाषा के रूप म. हिन्दी

2. व्याकरण शिक्षण - व्याकरण का अर्थ, महत्व, भाषा म. स्थान, शिक्षण के उद्देश्य एवं पाठ-योजना

इकाई 4: भाषा शिक्षण संबंधी विविध युक्तियाँ

1. संवाद

2. आभास

3. चाल-विवाद

4. सापाराकार

5. भाषा शिक्षण म. व्यावहारिक शब्द वापस. के प्रयोग संबंधी ज्ञान जैसे - क्षमा पावन, आमंत्रण देने एवं अस्वीकार करने ध्यान ज्ञान आदि

इकाई 5: पाठ-नियोजन एवं अभ्यास

सिद्धांत के माध्यम

व्याख्या -समूहिक चर्चा -निदारण एवं सामग्री विश्लेषण -विचारणांसी -विभिन्न साहित्यकाराएं, लेखक. एवं कविय. के विषय म. चर्चाएं -पुस्तकालय संसाधन, का उपयोग -भाषा प्रयोगशाला -महत्वों विलय का प्रयोग -दृष्टि-श्रद्धा पाठ. के माध्यम से सुझाव शिक्षण -व्याकरण प्रवर्तक, के शिक्षण हेतु पावर व्हाइट प्रस्तुतीकरण -पाठ योजना प्रस्तुतीकरण -अन्तर्विषयिक संव -प्रश्न पत्र निर्माण, मूल्यांकन एवं विश्लेषण -शब्दकोष तथा अन्य लाइन संदर्भ

प्रायोगिक कार्य

विश्लेषण पर हिन्दी की उपयुक्तता एवं उपयोगिता पर विचारणांसी -मौलिक एवं लेखन अभिव्यक्ति गतिपत्थियाँ -मुहावरे, लोकोक्तियाँ, का प्रयोग करने हेतु कहानी, लेख आदि लिखवाना -विचारवस्तु आभारित अभ्यास -सुद्धा एवं व्याकरण पाठ योजनाएं, बनाना -पावर व्हाइट प्रस्तुतीकरण -दृष्टि-श्रद्धा सामग्री का निर्माण -ब्लूप्रिंट, प्रश्न-पत्र, अस्पष्टयोजन तथा प्रश्ननुसार विश्लेषण -विषय वस्तु परीक्षण तथा उपलब्धि परीक्षण की संरचना -परीक्षण आंकड़ा. का प्रस्तुतीकरण - पाठ से संबंधित प्रायोगिक कार्य

मूल्यांकन के माध्यम
<table>
<thead>
<tr>
<th>संदर्भ-श्रेणी</th>
<th>विषयक रूपरेखा</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>अभास चौधरी, नागरी सिपी और हिंदी वर्तकी, विहार हिंदी ग्रंथ अकादमी, पटना।</td>
</tr>
<tr>
<td>2.</td>
<td>के.० कृष्ण, भारतभाषा शिक्षण, विनोद पुस्तक मंदिर, आगरा।</td>
</tr>
<tr>
<td>3.</td>
<td>के.० जी. रत्नांजी, भाषा सम्प्रदाय मूल्यांकन, केंद्रीय हिंदी संस्थान, आगरा।</td>
</tr>
<tr>
<td>4.</td>
<td>के.० के. पुष्कर, हिंदी ध्वनियों और उत्तरदीशिका, रामनारायण लाल, इलाहाबाद।</td>
</tr>
<tr>
<td>5.</td>
<td>जयनारायण कौलिक, हिंदी शिक्षण, हिंदी उच्चारण साहित्य अकादमी, चंपागढ़।</td>
</tr>
<tr>
<td>6.</td>
<td>जयनारायण कौलिक एवं और विमला कौलिक, पाठ-योजना निर्देशिका हिंदी शिक्षण, आयु बुक डिपो, करोलबाग, नई दिल्ली।</td>
</tr>
<tr>
<td>7.</td>
<td>जयनारायण कौलिक, शुद्ध हिंदी लेखन, आयु बुक डिपो, करोलबाग, नई दिल्ली।</td>
</tr>
<tr>
<td>8.</td>
<td>लिखने कुमार सिंह, मा.ए.ए.के.व.व. में हिंदी शिक्षण, राजस्थान वंद केंद्र, जयपुर।</td>
</tr>
<tr>
<td>9.</td>
<td>भगवती प्रसाद शुक्ल, हिंदी उच्चारण और वर्तकी, आयु बुक डिपो, करोलबाग, नई दिल्ली।</td>
</tr>
<tr>
<td>10.</td>
<td>भोलानाथ सिवारी, भाषा विज्ञान,किताब महल, इलाहाबाद।</td>
</tr>
<tr>
<td>11.</td>
<td>भोलानाथ सिवारी तथा कैलाश भाटिया, हिंदी शिक्षण, सिपी प्रकाशन, दिल्ली।</td>
</tr>
<tr>
<td>12.</td>
<td>गोमेन्द्रजीत, हिंदी भाषा शिक्षण, विनोद पुस्तक मंदिर, आगरा।</td>
</tr>
<tr>
<td>13.</td>
<td>रघुनाथ समंदर, हिंदी शिक्षण, पंजाब किताब घर, जालंधर।</td>
</tr>
<tr>
<td>14.</td>
<td>रमन विहारी साह, हिंदी शिक्षण, रत्नांजी पवित्रकेशन, मेरठ।</td>
</tr>
<tr>
<td>15.</td>
<td>रामचंद्र पांडेय, हिंदी शिक्षण, विनोद पुस्तक मंदिर, आगरा।</td>
</tr>
<tr>
<td>16.</td>
<td>लक्ष्मीनारायण शर्मा, भाषा की शिक्षण विधियों एवं पाठ-नियोजन, विनोद पुस्तक मंदिर, आगरा।</td>
</tr>
<tr>
<td>17.</td>
<td>वैधानिक प्रसाद वर्मा, विहार हिंदी ग्रंथ अकादमी, पटना।</td>
</tr>
<tr>
<td>18.</td>
<td>सीताराम चौधरी, भाषा की शिक्षा, हिंदी साहित्य कुटी, दारागासी।</td>
</tr>
<tr>
<td>19.</td>
<td>सावित्री सिंह, हिंदी शिक्षण, लायल बुक डिपो, मेरठ।</td>
</tr>
<tr>
<td>20.</td>
<td>शास्त्री भरत, स्वतंत्र शिक्षण और हिंदी की स्वभाविक त्वरस्थ, आयु बुक डिपो, करोलबाग, नई दिल्ली।</td>
</tr>
<tr>
<td>21.</td>
<td>हरिषेद्र विहारी, विद्वानहरिय हिंदी व्याकरण, लोक भारतीय प्रकाशन, इलाहाबाद।</td>
</tr>
</tbody>
</table>
Essence of the course:
Malayalam is the medium for comprehending ideas, for reflection and thinking, as well as for expression and communication. This course deals with aims and objectives of teaching Malayalam. It includes activities for developing fluency in language, learning process and practical experience. It also opens a gateway to Malayalam literature with special reference to prominent contributors in the language.

Objectives:
At the end of the course, the student teacher will be able
- To understand the aims and objectives of teaching Malayalam
- To develop fluency and discourse oriented presentation
- To get acquainted with the student, learning process and acquire practical experience in creating conducive environment for effective learning
- To contribute to enrich Malayalam Literature.
- To understand Functional Malayalam
- To get acquainted with Planning of Instruction based on theories of Learning.
- To get acquainted with instruction based on Linguistics poetics, vocabulary, grammar and composition.
- To understand the principles of organizing curriculum
- To understand the techniques of using text books, Teachers hand books and other relevant materials for transacting language curriculum.

COURSE CONTENT

Unit 1: Functional Malayalam
Punctuation, spacing, footnote, index, note taking, note making, summary, description, bio data, paraphrase, advertisement, brochures, pamphlets, posters, minutes, notice and notification, ambiguous words, government orders, amendments, references, gazette certificates, language in revenue documents, official terminology.

Unit 2: Planning of Instruction based on theories of Learning
Need and significance of Planning - Planning of Instruction - Year plan - Unit plan - Lesson plan (teaching manual) - Techniques and theories of developing year plan, unit plan and lesson plan - Techniques of developing learning equipment - Techniques of implementing learning activities and its evaluation - Process and utility of maintaining response sheet of the teaching manual.

Unit 3: Linguistics poetics, vocabulary, grammar and composition
The place of linguistics in language study - Importance of poetics in language study - Aims of teaching grammar at different levels-introduction of new approaches in teaching grammar - Aims of writing composition-General principles-composition for fostering creativity - Vocabulary – selection and gradation, Types (active, passive, content and structural) - Techniques of presenting vocabulary - Vocabulary expansion techniques - Spelling – Reasons causing spelling mistakes.
Unit 4: Organizing curriculum

Unit 5: Teachers hand books
Importance and significance of resource materials for teaching-learning process - Techniques of using teacher’s hand book, periodicals, magazines, handouts, books, and other local resources as learning materials - Techniques of using text books (prose and poetry) as learning materials.

Mode of Transaction:
Dialogue, seminars, discussions, and group-work

Practicum: Task and Assignment
1. Preparation of an album about life and literature of some prominent writers in Malayalam.
2. An analytical study of the grammar and vocabulary in textbooks used in schools from standard VIII to standard X.

Mode of assessment:
Written test and Task and assignment

References:
2. Damodaran Nair. P. – Apasabda Nighantu
4. Parameswaran Nair. P.K – Malayala Sahithya Charithram
5. Raghavan Payyanad – Folklore
6. Balasahithyam Thatwavum Charithravum – State Institute of Children Literature
8. Raman Nair. K.P – Aksharaslokavum Kavyakeliyum oru padanam
9. Iranjyam Ravi – Malayala Vyakarana Nighandu
10. Adhunika Bhasha Sastram – K.M. Prabakaravrior
11. Bhashayum Manasastravum – K.M. Prabakaravrior
15. Keralathinte Samskarika Charithram – Dr. P.K. Gopalakrishnan
Fourth Year

Semester 8

New York: Harkcourt, Brace & world, Inc.

20(v): Pedagogy of Telugu I – Part 4

Theory

Essence of the course:
Objectives:

CONTENT OUTLINE

Mode of Transaction
Practicum: Task and Assignment
Mode of Assessment
References:

Syllabus yet to be prepared for Pedagogy of Telugu I – Part 4.
20(vi): Pedagogy of French I – Part 4

Theory Credits 4

Essence of the course:
Equipping the student with French knowledge for communication. Learning the different approaches to teach French at schools. Learning to use the ICT tools for education in foreign language classroom. The course focuses on developing the ability of the future teachers to transact language in inclusive classroom.

Objectives:
At the end of the course, the student teacher will be able to

- develop French Language teaching competency.
- understand and appreciate the importance of French.
- have a critical study of learning French as a second language in the multilingual Indian Society.
- understand the role of French in India and to improve French Language attainment.
- produce the different methods, techniques and strategies of teaching French.
- prepare and use appropriate teaching aids to make teaching more effective.
- develop the various micro skills to teach French language.
- acquire the skill of preparing lesson plans to teach French.

CONTENT OUTLINE

Unit 1: Technology resources for French language teaching
Outils traditionnels: Magnétophone, radio, télévision Outils TICE modernes: Apprentissage Web, Tableau blanc interactif, Espace numérique de travail

Unit 2: Teaching of Culture
Terme « Interculture », « Interculturel », « Co-culturel » - compétence interculturelle - Stereotypes culturels en didactique des langues
Prescribed book : Manuel de formation pratique. P. 147-150, 154-155

Unit 3: Challenges in teaching French language
Problèmes qui surviennent lors de l’enseignement aux écoles indiennes. Difficultés affrontées par les enseignants de français et les suggestions pour résoudre ces problèmes

Unit 4: Analysis of syllabus, textual materials and professional competency of French teachers
Comprendre la relation entre le curriculum, syllabus et livre de texte. Qualités d'un bon texte Sélection du manuel - des matériaux -Développement des activités et tâches.

Unit 5: Assessment and evaluation in French
Concept de l’évaluation. Types d’évaluation – « Achievement Test », essais d'aptitude, tests diagnostiques, pronostiques. -préparation d'un « Achievement Test » -Concept et nécessité des cours de rattrapage.

Mode of Transaction:
Use of multimedia resources, Library resources, Accessing Online input on the topic, Print versions of texts focusing on communication, Usage of ICT, Introductory lecture, Micro-teaching
through video lessons, Lesson Plan preparation, Demonstration, Mind mapping, Small group discussions, Dictionary and Online referencing, Language Lab activities

**Practicum: Task and assignment**

1. Language games on grammatical structure
2. Dramatization and miming.
3. Project on formation of new words
4. Planning of 10 vocabulary building exercises and techniques to teach the students in the classroom.
5. Assignments & Library work
6. Preparation of audio visual aids (PPT, Charts, Models)
7. Listening to radio news and responding to questions.

**Mode of Assessment:**

Evaluation based on documentation (written) – Address the level of pupil involvement in Group Discussion – Performance evaluation (seminar, project and assignment) – Monitor the ability to distinguish between similar concepts – Use of Checklist to monitor, rate performance in each skill – Monitoring performance of communicative tasks

**References:**

1. ABRY D., VELDEMAN-ABRY J. *La phonétique: audition, prononciation, correction*, CLE, 2007, 1CD
8. TAGLIANTE., CHRISTINE., La classe de langue, coll, Techniques de classe, CLE international, 2006
20(vii): Pedagogy of Mathematics I – Part 4

Essence of the course:
This course is to enable students to specialize in Mathematics and to develop an understanding of the curriculum, linking school knowledge with community life. The course includes reconstruction of Mathematical Knowledge through appropriate pedagogic processes and to communicate meaningfully with children.

Objectives:
At the end of the course, the student teacher will be able to
• acquire the knowledge of competence in teaching Mathematics
• develop clear perception of the Secondary School Mathematics.
• develop awareness of recent trends and principles of construction of Mathematics curriculum.
• know the importance of computers in teaching and learning of Mathematics
• understand the various psychological aspects involved in teaching Mathematics
• know the importance of aesthetic and recreational Mathematics
• develop an understanding of resources of teaching and learning Mathematics.
• help the student teacher for the professional self-development
• enable the student teachers to identify gifted and slow learners in Mathematics and to meet the requirements.
• stimulate to pose and solve meaningful problems and creativity in Mathematics.
• develop insight into individual differences in learning Mathematics to cater to the needs and requirements of students.
• develop skills in construction of appropriate assessment tools for evaluating Mathematics learning.

COURSE CONTENT

Unit 1: Development of Problem-Solving Ability and Creativity in Mathematics

Unit 2: Mathematics education for all
Factors influencing the learning of Mathematics-Motivation, Perception, Attitude and Aptitude, Thinking (Divergent and Creativity), etc. - Gifted Children in Mathematics – Meaning, Characteristics and Enrichment programmes, NTSE – Mathematics Olympiad.

Unit 3: Evaluation

Unit 4: Recreational programme in learning Mathematics
Mathematics Recreational activities and Mathematics Quiz – importance and Organization.

Unit 5: Identification of learning difficulties
Identification of Learning difficulties - Slow Learners in Mathematics – Meaning, Characteristics, Reasons for Slow Learning and learning difficulties: dyslexia, dysgraphia and dyscalculia - remedial measures.

Modes of Transactions:

Learning Activities:
Learning the Content and practicing them appropriately, Oral work, drill, Review and Practicing Pedagogical Aspects for different areas of School Curriculum.

Practicum: Task and Assignment
1. Prepare remedial measures for any difficulties in learning Mathematics or prepare enrichment programmes for gifted children.
2. Create the collection of mathematical puzzles, riddles for secondary students
3. Collect the mathematical shapes and record it.
4. Search the NET about the mathematical correlation with other subjects
5. Construct any five problems that have multiple right solutions.

Mode of Assessment:

References:
**Fourth Year**  
**Semester 8**

**20(viii): Pedagogy of Physical Science I – Part 4**

**Theory**  
**Credits 4**

**Essence of the course:**
After having learning this Course, student teachers understand the nature of physical science teacher, the learner, resource material including ICT for teaching physical science and evaluation process. This course comprises, pedagogical approaches for organizing science related activities; and assessment of the learner.

The student-teachers will work with theoretical studies as well as on the field with school children from various backgrounds. They will capable to critically teach the science in their internship school and examine teaching learning processes also developing of self.

**Objectives:**  
**At the end of the course, the student teacher will be able to**
- acquire knowledge about the term and concepts used in teaching physical science.  
- understand nature of the learner and classroom situation.  
- apply the knowledge in constructing test and developing ICT resource in teaching physical science.  
- enhance skill in organizing and maintaining of physical science laboratory.  
- create interest in organizing science related activities.  
- develop a desirable positive attitude towards science teaching.

**COURSE CONTENT**

**Unit 1: Laboratory as a Learning Resource**
Objectives of laboratory work – Planning laboratory work – Approaches to laboratory work – Working plan for group of students (Batch) in the laboratory – Motivating students to maintain the regular record of laboratory work – Safety in laboratories and precautionary measures.

**Unit 2: Organization and Maintenance of Physical Science Laboratory**

**Unit 3: Assessment of children’s learning in Physical Science**

**Unit 4: Tools and techniques of assessment in physical science**
Purpose of assessment – tool and techniques of assessment: Project work, Field trips and field diary, Laboratory work, Concept mapping, Interview/oral test, written test including types and construction. – Recording and reporting: measurement of students’ achievements, grading system and type. – Measures of central tendency – measures of variability – correlation.
Unit 5: Professional Development of Physical Science Teachers

Teaching as a profession – need for pre-service professional development programmes – special qualities of a science teacher – ethics of a teacher – need for in-service professional development programmes – opportunities for in-service professional development – reflective practice – Teacher as researcher – Action research in physical science.

Mode of transaction:
Lecture-demonstration method, Project method, Problem-solving method, CAI, Observation method (field visit/exhibition/internship), Seminar/discussion

Practicum: Task and Assignment
1. Demonstrate the experiment to the peers in your college laboratory (Experimentation)
2. Creatively construct any 3 improvised apparatus (Exhibit).
3. Observe a school and draw general, physics and chemistry laboratory (Drawing)
4. Analyse and study continuous and comprehensive evaluation which is followed in your internship school (Report)
5. Construct a tool for an oral interview to assess the school children toward their academic interest (Survey).
6. Collect information related to in-service programme provided for professional development (Collection).

Mode of Assessment:
Written test, Task and assignment, Laboratory work, Observation

References:
9. Central Board of Secondary Education. (2010), Manual for Teachers on School Based Assessment Classes VI to VIII. Delhi.
Web Resources:
1. www.ncert.nic.in/departments/nie/desm/publication/.../phy_sci_partI.pdf
2. www.ncert.nic.in/departments/nie/desm/publication/.../phy_sci_PartII.pdf
4. UNESCO Competency Framework for Teacher
   www.unesdoc.unesco.org/images/0021/002134/213475e.pdf
6. ICT transforming education: a regional guide
   http://unesdoc.unesco.org/images/0018/001892/189216e.pdf
20(xi): Pedagogy of Biological Science I – Part 4

Theory

Essence of the course:
This course will introduce the student teachers to know about the advanced methods of teaching the biological science and make them to acquaint to have knowledge about conduct of practical’s, critically examine teaching learning process based on activity and get insight about meta – learning. This course further seeks to be self-improving through the processes of reflection, feedback, and critical inquiry. Consequently, science teacher must help their students to understand their role within the broader social community.

Objectives:
At the end of the course, the student teachers will be able to

- acquire knowledge about Individual learning strategies
- understand approaches of learning Biological science.
- apply the knowledge in constructing test and developing ICT resource and professional development in teaching Biological science.
- develop skill in practical work and organizing and maintaining of biological science laboratory.
- develop interest in using teaching resources and research in science education.
- develop a desirable positive attitude towards. tools and techniques of assessment of learning biological science.

COURSE CONTENT:

Unit 1: Research in science education
Types of Educational research – Status of research in science education in India – Educational research and innovation committee – utilization of science educational research

Unit 2: ICT Resources in learning bio–science

Unit 3: Professional development of biological teacher
Professional development programmes of science teacher –seminar, conferences, online sharing – members of professional organization. –Teacher as a community of learners – collaboration of school with colleges and universities and other institutions – role of reflective practice in professional development. –Teacher as a researcher – action research in biological science– Special qualities of a science teacher.

Unit 4: Exploring Learners
Identification of Diverse learners in classroom-addressing the diversity of learners in the classroom.– Motivating learners to bring their previous knowledge into classroom – involving learners in teaching learning process – encouraging learners to raise and ask questions- and its techniques.

Unit 5: Tools and techniques of assessment of learning biological science
Performance based assessment techniques – assessment of project work – assessment of participation in collaborative learning. –construction of test items (open ended and structure) and administration of tests – developing assessment frame work. – continuous and

Modes of transaction:
Lecture method, Assignment Method, Report writing, Field visit & Preparation of Field report, Laboratory Method, Presentation by students, Demonstration of scientific experiments.

Practicum: Task and Assignment
1. Designing and carrying out of any five simple investigation of Biology (keep it in a record).
2. Prepare a digital content (ie. Powerpoint) on any topic related to bio-science.
3. Write any one articles or science research project report. (send it for publication at student journals)
4. Visit your nearby any 2 high school and higher secondary school observe and draw Biology laboratory.
5. Arrange for a field trip and write a report

Mode of Assessment:

References:
3. Central Board of Secondary Education. (2010), Manual for Teachers on School Based Assessment Classes VI to VIII. Delhi.
20(x): Pedagogy of Social Science I – Part 4

Theory

Essence of the course:
This course helps to sensitize the learners the relevance of social science in the current context. It makes them familiar about the techniques and approaches of teaching social science. It helps the learner well acquaint the preparation and administration of learning resources in the meaningful way. It also develops the competency in making use of appropriate assessment system to apprise the learning outcomes. This course deals about the various social issues and mould them to face the same in a plausible way.

Objectives:
At the end of the course, the student teacher will be able to
- acquire basic knowledge and skills to analyse and transact the Social Science curriculum effectively following wide-ranging teaching
- acquire a conceptual understanding on the process of teaching and learning Social Science
- sensitise and equip student teachers to handle social issues and concerns in a responsible manner.
- Develop ability for critical and logical thinking and apply the acquired knowledge and skills in unfamiliar situations
- Acquaint with different methods, approaches and techniques of teaching social science
- Develop ability to design different evaluation tools
- Develop practical skills for analysing socio-economic, political and physical phenomena

CONTENT OUTLINE

Unit 1: Social Science Teacher
Social Science Teacher – The profile of a competent Social Science Teacher – Characteristics, Attitude for professional development – participation in professional bodies - Role of Teacher as a National Builder – Problems of Social science Teachers

Unit 2: Social Science Text-Book

Unit 3: Co-curricular activities in Social Science
Co-curricular activities for developing critical thinking and attitude, planning and organization of activities like exhibition, quiz, competition, Panel discussion and Social science club.

Unit 4: Remedial Teaching in Social Science
Diagnostic Test – Meaning and Definition of Remedial Teaching – relevance of remedial teaching – procedure for remedial work – Remedial strategies of Social Science Teaching

Unit 5: Social Science Laboratory: Design and Management
Principles of designing the Social Science laboratory for secondary schools; location, norms with reference to lighting, ventilation, working space and flexibility – store room, community corner, preparation room.
Mode of Transaction
Lecture cum discussion, Problem Solving, Dramatization, Seminar, Field visit, Debate, Group Discussion.

Practicum: Task and Assignment
1. Organizing Awareness campaign or Rally.
2. Conducting educational survey of a slum area in a neighbouring village
3. Preparation of report on social customs, traditions, and supercilious beliefs

Mode of Assessment
Unit test, Project, Preparation of assignments, Assessment of Learning Resources, Seminar Presentation.

References:
10. UNESCO: New Source Book for Teaching of Geography, UNESCO
Essence of the course:

This course is to enable students to specialize in Computer science and to develop an understanding of the curriculum, linking school knowledge with community life. The course includes reconstruction of Computer Knowledge through appropriate pedagogic processes and to communicate meaningfully with children.

Objectives:

At the end of the course, the student teacher will be able to

- enable the student teachers acquire knowledge about Informational Communicational Technology in Education
- develop an understanding about the Internet and Its applications
- guide the student teachers about planning and maintaining the Computer laboratories
- familiarize the student teachers with the Modern Trends in Teaching of Computer Science
- enable the student teachers acquire knowledge about blended learning and its models
- familiarize the student teachers with the multimedia, web designing, and Computer programming

CONTENT OUTLINE

Unit 1: Modern Techniques in the Teaching of Computer Science
Seminar – Symposium – Group Discussion – Panel discussion – Workshop techniques – Collaborative learning – Team teaching;

Unit 2: Multimedia in Education

Unit 3: Fundamentals of C and C++ Programming

Unit 4: Web pages and Web Designing

Unit 5: Computer Science Teacher and Evaluation
Academic and Professional qualification of Computer Science Teachers – Special qualities required for a computer science teacher; Evaluation by pupils and Self-evaluation – Classroom interaction analysis;

Mode of Transaction:
Lecturing on Theoretical Concepts, use of computers in lab, Analytic and Synthetic Methods of Teaching, Project Method, Tasks and Assignments

Practicum: Task and Assignment
9. Develop the Multimedia package (Any one lesson at secondary or senior secondary level)
10. Create an Educational Blog (Individually)
11. Draw the Computer based Concept maps
12. Prepare self-blended learning module
13. Write a C programme – Students Mark list using array
14. Create a simple website for your class (Upload: Assignment, Exam details, Study materials)
15. Organize the Team Teaching among student trainees
16. Prepare the rating scale for self-Assessment of student teachers (use during the teaching practice)

Mode of Assessment

References:
Fourth Year  
Semester 8

Edn 21: C&PS - PEDAGOGY OF SCHOOL SUBJECT II

21(i): Pedagogy of Tamil II - Part 4

கற்பித்தல் பகுதி II - பகுதி 4

Theory  

Credit 4

அப்பாளை நூல்கள்

பதிப்புகள்:  

- தமிழ்மொழி நூல்கள் வரலாற்றும் அறிவு பொறுப்பு.  
- பதிப்பு நூல் அருங்காட்சியாக கொண்டு வரும் பதிப்பு வரலாற்றும் அறிவு பொறுப்பு.  
- பதிப்பு நூல் தொகுப்பு வாய்ந்த அறிவு பொறுப்பு.  
- பதிப்பு நூல் தொகுப்பு வாய்ந்த அறிவு பொறுப்பு.  
- பதிப்பு நூல் தொகுப்பு வாய்ந்த அறிவு பொறுப்பு.  
- பதிப்பு நூல் தொகுப்பு வாய்ந்த அறிவு பொறுப்பு.

அணு 1: தமிழ் ஆய்ந்திருக்கும் பயிற்சிகள்  

- அப்பாளை பயிற்சிகள் - குருக்களின் முக்கியத்துவம் - ஏமைந்து முழுந்துவைய பயிற்சிகள் - பொறுப்பு

அணு 2: தமிழ் பயிற்சிகளும் பல்கலைக்கழகங்களும்

- கல்கட்டுறவு பல்கலைக்கழகங்கள் - தொகுப்பு இலக்கணம் - பொறுப்புகள் அரசியர் - பொறுப்புகள் - குருக்கள் - குருக்கள் வழிநுட்ப வளர்ச்சி.

அணு 3: பல்கலைக்கழகங்களின் முன்னணி

- கல்கட்டுறவு முன்னணி - கல்கட்டுறவு முன்னணி - ஆசிரியர் பல்கலைக்கழகங்கள் - பொறுப்புகள் தொகுப்பு வழிநுட்ப வளர்ச்சி - பல்கலைக்கழகங்கள் துறைந்தைகள்.

அணு 4: குருக்களின் பயிற்சிகள்

- குருக்களின் பயிற்சிகள் - குருக்களின் பயிற்சிகள் - குருக்களின் பயிற்சிகள் - குருக்களின் பயிற்சிகள் - குருக்களின் பயிற்சிகள் - பயிற்சிகள்.
Fourth Year

Semester 8


Pondicherry University

4. 5: Assessment Criteria

- Assessment criteria for the semester - evaluation methods for the various sections and evaluation methods for the end of the semester. The evaluation methods include:

1. Project-based assessment.
2. MCQs based assessment.
3. Assignment based assessment.
5. Assignments based assessment.

Books for Reference:


Edn_196
21(ii): Pedagogy of English II – Part 4

Essence of the course:
Equipping the student teacher with English knowledge for communication and appreciation. Developing the skill of communication in order to help children at various school levels towards effective communication. The course focuses on developing the ability of the future Teachers to transact language in inclusive classroom.

Objectives:
At the end of the course, the student teacher will be able to
- develop English Language teaching competency.
- understand and appreciate the importance of English.
- have a critical study of learning English as a second language in the multilingual Indian Society.
- understand the role of English in India and to improve English Language attainment.
- produce the different methods, techniques and strategies of ELT.
- Prepare and use appropriate teaching aids to make teaching more effective.
- develop the various micro skills to teach English language.
- acquire the skill of preparing lesson plans to teach English.

CONTENT OUTLINE

Unit 1: Skill of speaking
Concept of speaking in English as a second language. Use of pronouncing dictionary- Technique of teaching speaking skills and pronunciation practice and drills – Ear Training, Repetition, Dialogues and conversation: Role of A.V. aids in teaching speaking skills.

Unit 2: Skill of writing
Mechanics of writing; Skills of writing- Discourse skill and Judgment Skill Reference skills- note making and note taking, reporting, summarizing, paragraphing, Characteristics of good hand writing, methods to develop good handwriting.

Unit 3: Challenges of teaching English language
Problems cropped up while teaching English in Indian schools - Difficulties faced by English teachers in the classrooms and suggestions to overcome them. Interference and influence of mother tongue.

Unit 4: Analysis of syllabus, textual materials and professional competency of English teachers

Unit 5: Assessment and evaluation in English
Concept of assessment and Evaluation in English- Concept, need and techniques of Continuous and Comprehensive Evaluation (CCE) in English- Types of tests - Achievement test,
Fourth Year

Semester 8

proficiency test, Diagnostic test, Prognostic test.-Preparation of an Achievement test- Concept and need of remedial teaching.

Mode of Transaction:

Demonstration of teaching specific grammar items, Seminar on different expressions, Comparative study of various forms of compositions, Demonstration of steps followed in different methods, Introductory lecture, Observation of video clips, Through Situational presentations. Usage of Language games, Presentation of good models by native speakers, Through language lab, Framing, evaluating and interpreting a question paper.

Practicum: Task and Assignment

1. Watching video recordings
2. Oral Communication tasks
3. Language Lab activities
4. Workshop on preparation of blue prints, question papers, marking scheme and question wise analysis.
5. Construction of test items for diagnosis and achievement test and interpretation of test data

Mode of assessment:

Analysis of Group discussion, Participant Observation, Monitoring performance of communicative tasks, Evaluation based on documentation (written), Performance evaluation (Seminar, Assignment & Project)

References:

15. Françoise Grellet. (1986) Developing reading skills, CUB.
पुष्पभूमि:
राष्ट्रीय पादुकाव्यांपेक्षा 2005 तथा शिक्षा का अधिकार एकट 2009 विश्वासी शिक्षा तथा शिक्षण प्रशिक्षण के निकट सम्बन्ध को ध्यान में रखने हेतु शिक्षकों की भूमिका में एक बहुत बड़े परिवर्तन को मांग करती है। पादर्शार्थ में अभी तक का शिक्षकों को ही जान के स्रोत के रूप में क्षेत्रीय रूप से मिलता रहा है, जहाँ सीखने-सिखाने की समस्याओं के संरक्षक और प्रबंधक के रूप में मुख्य भूमिका निभाने का काम करते हैं। पर 2005 की स्कूली पादर्शार्थ उनसे मांग करती है कि वे सुनिक्षेपों के विवरण और जान के स्रोत बन कर रहे बल्कि विशेषधर्मी द्वारा जाना हस्ताक्षरपूर्वक प्रक्रिया में स्वयं का सहयोग दें। इन सब परिवर्तनों को उनके व्यवहार का हिस्सा बनाने के लिए जरूरी है कि अध्यापक शिक्षा के पादर्शार्थ में परिवर्तन करे। विश्वासी शिक्षा व्यवस्था में परिवर्तन को पहले तभी संभव होगा जब इस व्यवस्था में जुड़े लोगों को संच से और प्रदर्शन में परिवर्तन करे और शिक्षक की भूमिका इस व्यवस्था में सबसे महत्वपूर्ण है। इस प्रकृति में भाषा-शिक्षण का पादर्शार्थ और भी महत्वपूर्ण हो जाता है, क्योंकि भाषा पूरी शिक्षा का आधारशिला का काम करती है, जहाँ इसमें भाषा पढ़ना-सीखना नहीं बल्कि भाषा के द्वारा अन्य विषयों में भी निगमन प्राप्त करने की बात आती है। इसके साथ ही भाषा से जुड़े उन विद्वानों जैसे - शहीद बाबू किशोर, समाज का माध्यम, शास्त्री की शिक्षा में भाषा की भूमिका आदि की समझ शिक्षकों के लिए जरूरी है जो अध्यापक शिक्षा में व्यक्त बदलव को मांग करते हैं।

वर्तमान पादर्शार्थ भाषा के नए सरोकारों और सीखने-सिखाने को नई वृद्धियों के ध्यान में रखकर तैयार किया गया है। आशा है कि शिक्षक प्रशिक्षणाध्यापकों को इससे भाषा-शिक्षण की तेजी में सहायता मिलेगी।

पादर्शार्थ के विषय उद्देश्य
- भाषा के अनल-अनल भूमिकाओं का जानना
- भाषा सीखने के स्वतंत्रसंघ प्रक्रिया का जानना
- भाषा के स्वरूप और व्यवस्था को समझना
- शुरु को भाषा, व्यवस्था की भाषा और समाज के बीच के रूपांतर का जानना
- भाषा के संदर्भ में पढ़ने के अंतरक, शास्त्री और प्रभावण के प्रति संदेह होना
- भाषा सीखने के रूपांतर और प्रक्रिया को जानना और समझना
- पादर्शार्थ, पादर्शार्थ और प्रदर्शन का विवरण कर कथा विवरण और बच्चों की समझ के अनुसार दास्ताज
- भाषा और साहित्य के संबंध को जानना
- हिदी भाषा के विविध रूपों और अभिव्यक्तियों के जानना
- भाषा और सिखाने की संबंधत अभिव्यक्ति करना
- भाषाविद्वानों और प्रति संदेहरोगियों देखना
- अनुसंधान के माध्यम और प्रभावण का जानना
- विशिष्टविद्वानों की सूचनात्मक श्रमिक का पहचानना
- हिंदी के पादर्शार्थ विवरण का प्रति संदेह होना और उसे समाक्ष करने के लिए विश्वासी में तथ्य-तथ्य के मूल्ययुक्त प्रक्रिया को जानना
- साहित्यिक और गैर-साहित्यिक मैलिफक रचनाओं की समझ और समझना
- भाषा सीखने-सिखाने के मूल्ययुक्त प्रदर्शन का समझना

इकाई 1:
अन्य साहित्यिक विषयों का शिक्षण जीवनी,आत्मकथा,संस्थान,रेखाचित्र आदि विषयों का शिक्षण

इकाई 2:
भाषा शिक्षण की विचित्री की संख्यात परिचय
Fourth Year

Semester 8

(क) अनुवाद विषयः (ख) प्रवक्त विषयः (ग) वाचन विषयः (घ) दृष्य श्रेणी विषयः -(ड.) इकाई विषयः
(च) समन्वय विषयः (छ) स्वायत्त विषयः (ज) सूचना शिक्षण

इकाई 3:
हिन्दी शिक्षण में शैक्षिक सामग्री, शैक्षिक सामग्री का महत्व, उपयोगिता तथा अत्यधिक अथवा, दृष्य सामग्री का निर्माण।
- पुस्तकालय, संग्रहालय, कम्प्यूटर।

इकाई 4: मूल्यांकन
(क) हिन्दी शिक्षण में मूल्यांकन का महत्व। -(ख) परीक्षा और मूल्यांकन में अंतर। -(ग) परीक्षा युक्तियाँ। -(घ) प्रश्नों के प्रकार – निबंधात्मक, लघु उपायक तथा वस्तु निष्ठ प्रश्न।

इकाई 5:
(अ) भाषा शिक्षण संबंधी विषय युक्तियाँ। -(क) संवाद। -(ख) अभिनय। -(ग) बाद-विवाद। -(घ) साक्षात्कार
(ड.) भाषण। -(ब) भाषा शिक्षण में व्यवहारिक शब्द, वाक्यों के प्रयोग संबंधी ज्ञान जैसे – श्रम याचना, आंदोलन देने एवं अस्तित्व करने ध्यान धारण आदि। – पाठ नियोजन एवं अभ्यास

संदर्भ-प्रेम
1. ह.र. विजयसारस रेरटी - हिन्दी शिक्षण अन्य भाषा के संदर्भ में
2. कामता प्रसाद गुरू - हिन्दी व्याकरण
3. ह.र. रामचन्द्र वर्मा - अभिन्य हिन्दी
4. ह.र. नाममित सिंह - आधुनिक साहित्य की प्रवृत्तियाँ
5. ह.र. रामसूय पांडेय - विषय साहित्यिक बाद
6. ह.र. लक्ष्मीनारायण शर्मा - देवनागरी लिपि और वर्तनी
7. ह.र. रुयान सफाया - हिन्दी शिक्षण
8. ह.र. रामदेव पी. केशुराय - सूचना शिक्षण
9. केंद्रीय हिन्दी संस्थान के प्रकाशन
   1. हिन्दी का वैज्ञानिक व्याकरण
   2. देवनागरी लेखन तथा हिन्दी वर्तनी व्यवस्था
   3. हिन्दी शिक्षण विषय साहित्य आधार
   4. हिन्दी शिक्षण अंतराष्ट्रीय परिप्रेक्ष्य
   5. द्वितीय भाषा शिक्षण में अभिकल्पित अधिगम की तैकनालॉजी
   6. भाषा शिक्षण तथा भाषा विज्ञान

Practicum: Task and Assignment
Minimum 2 activities relevant to the syllabus.
Essence of the course:
This course equipping the student teacher with Malayalam knowledge for communication and its values for appreciation. This course deals with Malayalam usage and society. Usage of ICT, research in Malayalam language, professional traits of Malayalam teachers are reflected. The course focuses on developing the ability of the future teachers to transact language in inclusive classroom.

Objectives
At the end of the course, the student teacher will be able to
- appreciate the role of Malayalam in the society
- familiarize the IT related professional inputs of teaching.
- understand the meaning, importance and concept of models of teaching in Malayalam language teaching.
- Use of Malayalam on Computers
- Apply phonetics of Malayalam
- Critical thinking and creative writing
- Know about action research
- be a professional Malayalam teacher.
- acquaint with the co-curricular activities in Malayalam.

CONTENT OUTLINE

Unit 1: Critical thinking and writing
Critical thinking and creative writing - Critical appreciation of a poem - Novel, drama or a short story - Writing criticism of a contemporary novel, short story and a poem - Analysis of important critical works in Malayalam.

Unit 2: Research in Malayalam
Action research - steps in an action research - action research for language teachers.

Unit 3: Professional traits of a Malayalam Teacher
Professional development of Malayalam teacher - Teaching as a profession - Professional ethics - Personal and professional qualities of a teacher - Special qualities of Malayalam teacher - Ways and means of improving professionalism among Malayalam teachers - Traits of professionalism competencies listed by NCTE.

Unit 4: Activities in learning Malayalam
Co-curricular activities based on school related activities like literary club, drama club etc. - Malayalam language and Cinema.

Unit 5: Teaching of Prose, Poetry and Composition
Aims of teaching prose – different types of prose lessons and different approaches – Non-detailed prose – Training for independent and extensive reading – Methods of teaching the non-detailed text in lower and higher classes – Poetry – Appreciation, rhythm, dictions, ideas,
emotions, imaginary expressions, suggestions etc. – Different types of poetry – composition – General principles.

Mode of Transaction
Dialogue, seminars, discussions, and group-work

Practicum: Task and assignment
1. Prepare a review of any literary work of Indian writer in Malayalam published in last ten years.
2. Keeping in view the needs of children with special needs prepare 2 activities for Malayalam Teachers.
3. Prepare a report on challenges faced by teachers and learners in teaching and learning of Malayalam in Kerala.
4. Develop a Power Point presentation to teach any topic from Malayalam reader
5. Preparation of author’s album, stick figure albums, flash cards for classroom teaching.

Mode of assessment:
Written test and Task and assignment

References:
1. Sabhasodhini
2. Keralaapanineeyam
3. Bhashabhooshanam
4. Malayalasaili
5. Vrithasilpam
6. Keralaabhasahavijnaneeyam
7. Vrithavicharam
8. Kairaliyute Katha
9. The teaching of Mother tongue by W.M. Rhyburn
10. Malayalasahithaycharithram
11. Enthanu Blog? Blogging engane thudangam
12. Vijayam nedan social media.
17. SCERT(2007),Kerala Curriculum Frame work.Trivandrum:SCERT
21(v): Pedagogy of Telugu II – Part 4

Theory

Essence of the course:
Objectives:

CONTENT OUTLINE

Mode of Transaction
Practicum: Task and Assignment
Mode of Assessment

References:

Syllabus yet to be prepared for Pedagogy of Telugu II – Part 4.

21(vi): Pedagogy of Mathematics II – Part 4

The same syllabus as given for course – 20(vii)

21(vii): Pedagogy of Physical Science II – Part 4

The same syllabus as given for course -20(viii)

21(viii): Pedagogy of Biological Science II – Part 4

The same syllabus as given for course – 20(ix)
Edn 22: C&PS - ASSESSMENT FOR LEARNING – II

Theory

Essence of the course:
The course is designed keeping in mind the role of assessment in enhancing learning. It will focus on various tools and techniques of evaluation. There will also be focus on continuous and comprehensive evaluation. The course will also deal with critical understanding of issues in assessment and also explore realistic, comprehensive and dynamic assessment process. The course will also give emphasis on the need for formative and summative evaluation as well as quantitative and qualitative assessment for learning.

Objectives:
At the end of the course, the student teacher will be able to
- acquire basic concepts in assessment and evaluation.
- develop the awareness about different areas of assessment.
- discriminate different perspectives in assessment.
- develop understanding about the meaning and the process of CCE
- know different techniques of evaluation, tools of evaluation and their uses.
- know different characteristics of instruments of evaluation.
- discriminate teacher made test vs standardized tests in assessment
- prepare, administer and interpret of results of tests and different evaluation techniques
- compute simple statistics to assess the learning.
- develop awareness about use of technology in assessment and evaluation.

COURSE CONTENT

Unit 1: Characteristics of Instruments of Evaluation

Unit 2: Teacher made Achievement Tests
Essay and Objective type tests – Improving essay type questions – Different types of objective tests, their characteristics, advantages and disadvantages. – Relating test items and specific behavioural objectives – Preparation of blue print – Characteristics of a good test

Unit 3: Standardized tests
Concept and characteristics of standardized test – advantage and disadvantage using standardized tests and teacher made tests – standardized tests for measuring intelligent, attitude, aptitudes, interest, values, personality, and achievement.

Unit 4: Teaching effectiveness and assessment:
Concept and criteria for assessing teaching effectiveness – Assessing teaching using observation schedules – Student evaluation of teaching – student’s ratings of teaching effectiveness, dimensions and problems. – Uses of assessment for feedback for improving instructional process – System(Flander’s) for observation for recording classroom interaction patterns and uses –Use of interaction analysis in the classroom for teacher assessment.
Unit 5: Technological based Quantitative and Qualitative analysis of learning outcomes

Mode of Transaction:
Lecture cum discussion, Seminar, Team Teaching, Practical work, Power point presentation

Practicum: Task and Assignment
1. Preparation, administration and interpretation of results of tests and different evaluation techniques
2. Writing educational objectives, learning experience and corresponding evaluation techniques, General and specific objectives
3. Framing measurable and non-measurable learning outcomes
4. Finding out the content validity of the given question paper
5. Designing Rating scale, Questionnaire, Interview Schedule in a given a topic
6. Framing Different types of questions
7. Preparation of Blue Print and a question paper
8. Prepare graphs and use statistics for analysis of test result
9. Preparation of interaction analysis report after the observation of any five teachers and peer teachers working in schools

Mode of Assessment:
Submission of Assignments, Preparation of tests various types of test items, Data collection and statistical analysis, Participation in Group discussion

References:
1. Assessment for Learning and Teaching in Primary Schools By Mary Briggs, Angela Woodfield, Peter Swatton
Practicum: TEACHING COMPETENCY

Each student teachers will be attached to a school or two schools in one or two blocks of internship. The total duration of internship will be 16 weeks. During internship in a school, Student teachers should perform the roles of a regular teacher at the respective level under the direct guidance and supervision of the mentoring teacher (Supervising / Guide Teacher) of the school. While at school, the student teacher shall prepare the necessary teaching resources and records for teaching lessons (duration of 45 minutes each). Each student teacher will spend first week of internship for observation. During the internship student teacher will develop teaching competency by observing and teaching lessons in both the pedagogy subject chosen. The details of roles to be performed and records to be produced with respect to Pedagogy of school Subject I and II. and Course at the end or given below.

PEDAGOGY OF SCHOOL SUBJECT I

Practicum

During the first week of the internship, the student teachers will observe classes taken by regular school teachers (at least 5 lessons in pedagogical subject I)

During the next 15 weeks, each student teacher has to give at least 15 lessons for Pedagogical Subject I (at least one should be ICT based) at level one and 15 lessons (at least one should be ICT) at level two

The internship for graduates must be both at upper primary (classes VI- VIII) and secondary (classes IX and X) and for post graduates, it should be at upper primary (classes VI - VIII) or secondary (classes IX and X) and senior secondary (XI and XII) levels. During the internship student teachers will also be engaged in making observation of classes taught by regular teacher (whenever possible) and the peer teachers.

During this period, (i) classroom teaching (ii) evaluation at the end of 15 lessons and (iii) diagnosis based feedback to the students should be completed by every student teacher.

The records to be produced at the end of the internship:

1. 15 lesson plans at each level
2. Lesson Observation records on observations of classes taught by both regular and peer teachers.
3. Teaching resources prepared and used including ICT based
4. Test constructed and administered on students at the end of 15 lesson at each level followed by evaluation report.
5. Record on diagnosis based remedial programme carried out on students
PEDAGOGY OF SCHOOL SUBJECT II

Practicum
Credits 8

During the first week of the internship, the student teachers will observe classes taken by regular school teachers (at least 5 lessons in pedagogical subject II)

During the next 15 weeks, each student teacher has to give at least 15 lessons for Pedagogical Subject II (at least one should be ICT based) at level one and 15 lessons (at least one should be ICT) at level two

The internship for graduates must be both at upper primary (classes VI- VIII) and secondary (classes IX and X) and for post graduates, it should be at upper primary (classes VI - VIII) or secondary (classes IX and X) and senior secondary (XI and XII) levels. During the internship student teachers will also be engaged in making observation of classes taught by regular teacher (whenever possible) and the peer teachers.

During this period, (i) classroom teaching (ii) evaluation at the end of 15 lessons and (iii) diagnosis based feedback to the students should be completed by every student teacher.

The records to be produced at the end of the internship:
1. 15 lesson plans at each level
2. Lesson Observation records on observations of classes taught by both regular and peer teachers.
3. Teaching resources prepared and used including ICT based
4. Test constructed and administered on students at the end of 15 lesson at each level followed by evaluation report.
5. Record on diagnosis based remedial programme carried out on students
AECC: A2 - INTRODUCTION TO PUBLIC ADMINISTRATION

Theory

Credits 2

(Compulsory Course designed as per the directions issued by Government of India, MHRD, Department of Higher Education (Central University Bureau) F.No.19-6.2014-Desk U Dated 19-05-2014)

Course Rationale:
This Course introduces the students to the elements of public administration. This would help them obtain a suitable conceptual perspective on Public Administration. In addition, the course introduces to students, the growth of such institution devices as to meet the need of changing times. The course also aims to instill and emphasize the need of ethical seriousness in contemporary Indian public administration within the Constitutional framework.

COURSE CONTENT

Unit 1: Introduction:
Meaning, nature and Scope of Public Administration and its relationship with other disciplines-
Evolution of Public Administration as a discipline – Woodrow Wilson, Henry Fayol, Max Weber and others - Evolution of Public Administration in India – Arthashastra – Colonial Administration upto 1947

Unit 2: Public Administration in India

Unit 3: State and Union Territory Administration
Differential Administrative systems in Union Territories compared to States Organization of Secretariat: -Position of Chief Secretary, Functions and Structure of Departments, Directorates – Ministry of Home Affairs supervision of Union Territory Administration – Position of Lt.Governor in UT – Government of Union Territories Act 1963 – Changing trend in UT Administration in Puducherry and Andaman and Nicobar Island

Unit 4: Emerging Issues in Indian Public Administration

Modes of Transaction:
Lectures and seminars

Mode of Assessment

References:
8. http://www.cvc.nic.in/
10. Ramesh K Arora, Indian Public Administration, New Delhi: Wishwa Prakashan