# MINUTES

## 27th Meeting of the Academic Council

**Dated: 18/02/2019 at 11:00 A.M.**

***Venue: Central University of Haryana, Mahendergarh***

The 27th meeting of the of the Academic Council of Central University of Haryana was held on February 18, 2019 at 11:00 A.M. in the Conference Room, Academic Block-I, Central University of Haryana, Mahendergarh, Haryana.

The following members were present: -

1. Prof. R.C. Kuhad, Vice Chancellor - Chairperson
2. Prof. R.P. Tandon
3. Prof. K.P.S. Mahalwar
4. Dr. (Mrs.) Shimla
5. Prof. P.C. Pattnaik
6. Prof. R.S. Yadav
7. Dr. P.K. Khurana
8. Prof. Bir Singh
9. Prof. Sanjiv Kumar
10. Prof. Sarika Sharma
11. Prof. Nawal Kishore
12. Prof. Rajesh Kumar Malik
13. Prof. Deepak Pant
14. Prof. Satish Kumar
15. Dr. Ajay Kumar Bansal
16. Dr. Parmod Kumar
17. Dr. Chanchal Kumar Sharma
18. Dr. Gunjan Goel
19. Dr. Vikas Garg
20. Dr. Rajesh Kumar Gupta
21. Dr. Vinay Kumar Rao
22. Dr. Bijender Singh

23. Dr. Vinod Kumar
24. Dr. Ajai Pal Sharma
25. Dr. Anju Beniwal
26. Prof. Ranvir Singh, Chair Professor - Special Invitee
27. Dr. Vipul Yadav, COE - Special Invitee
28. Sh. Ram Dutt, Registrar - Secretary

The following members had expressed their inability to attend the meeting: -

1. Dr. M.P. Poonia
2. Prof. R.K. Anayath
3. Prof. M.C. Garg
4. Prof. Vijay Kumar Kayat
5. Prof. S.V.S. Choudhary
6. Prof. Om Prakash Arora
7. Prof. Neelam Sangwan
8. Dr. Avanijesh Awasthi
9. Dr. Anand Sharma

**At the outset, the Vice-Chancellor extended a warm welcome to all the members of the Academic Council. The Vice-Chancellor apprised the Council about the Academic and other achievements made by the University in the recent past. The Council was apprised that 107 students of the University have qualified UGC (NET/JRF) in the year 2018. The Council appreciated the models prepared by the School, College and University students for demonstrating the same on the Science Day i.e. 28.02.2019.**

***Agenda Items***

<table>
<tr><th>Item No.</th><th>DESCRIPTION</th></tr>
<tr><td>1.</td><td>The Minutes of the 26th meeting of the Academic Council held on October 17, 2018, were confirmed.</td></tr>
<tr><td>2.</td><td>The actions taken on the resolutions of the 26th meeting of the Academic Council held on October 17, 2018, were reported, recorded and confirmed.</td></tr>
<tr><th colspan="2">ITEMS FOR CONSIDERATION</th></tr>
<tr><td>3.</td><td>Resolved that the following recommendations made by the Committee, constituted by the Vice-Chancellor to review the various provisions of Ordinance-XX (Revised) related to Convocation, be approved and recommended to the Executive Council for approval:
<table>
<tr><th>Existing Clause</th><th>Amendment Proposed</th></tr>
<tr><td>7. Academic Dress<br>Candidates at the Convocation shall wear Academic Dress (gowns) appropriate to their respective degree as specified under this Ordinance. No</td><td>7. Academic Dress<br>All dignitaries/on dais, Deans, HoDs, supervisors (faculty) and graduands are required to come in prescribed dress at</td></tr>
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| | candidate shall be admitted to the Convocation who is not in the prescribed academic dress.<br><br>The Academic Dress of the University for Convocation shall be as follows:<br><br>**7.1. Members of the Procession**<br><br>**7.1.1. For the Chancellor**: Royal blue colour handloom fabric gown with lace (width 3") on the front folds round the neck and around the sleeves and the logo of the University. Cap for the Chancellor in pure hand-spun, hand-woven handloom fabric with golden tassel and mortar band.<br><br>**7.1.2. For the Vice Chancellor**: Maroon colour handloom fabric gown with lace (width 2") on the front folds round the neck and around the sleeves and the logo of the University. Cap for the Vice-Chancellor in pure hand-spun, hand-woven with golden tassel and mortar band.<br><br>**7.1.3. For the Pro-Vice Chancellor**: Silver colour handloom fabric gown with lace (width1½) on the front folds round the neck and around the sleeves and the logo of the University. Cap for the Pro-Vice Chancellor in pure hand-spun, hand-woven with golden tassel and mortar band.<br><br>**7.1.4. For the Chief Guest/Guest(s) of Honour**: Purple colour handloom fabric gown with lace (width 3") on the front folds round the neck and around the sleeves and the logo of the University. Cap of pure hand-spun and woven with golden tassel.<br><br>**7.1.5. For the Registrar**: Golden colour handloom fabric with lace (width 1") on the front folds round the neck and around the sleeves and the logo of the University. Cap of pure hand-spun woven with golden tassel.<br><br>**7.1.6. For the Controller of Examinations and the Finance Officer**: Green colour handloom fabric gown with lace (width 1") on the front folds round the neck and around the sleeves with lace and the logo of the University. Cap of pure hand-spun and woven with golden tassel.<br><br>**7.1.7. For the Deans of the Schools of Studies**: Red handloom fabric gown with lace (width 1") on the front folds round the neck and around the sleeves with lace and the logo of the University. | the Convocation as specified under this Ordinance. No candidate shall be admitted to the Convocation who is not in the prescribed academic dress.<br><br>**Academic Dress:**<br>1. White kurta, pyjama/pants for males.<br>2. Off white saree with a Mehroom/Red border (Two Inches) or off white kurta, salwar/ churidar/ pants for females.<br>3. Off white color scarf provided by the University.<br>4. Formal footwear.<br><br>**Specifications of scarf:**<br>Size of Scarf: Length: 2 Mtr, Width: 8.5 inches, Border: 4 cms of blue base with golden zari having University logo on ***both sides.***<br>***With Golden lace at both the ends.*** |

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| | Cap of red handloom fabric with golden tassel and mortar band.<br>7.1.8. **For the members of the University Authorities:** Superior black handloom **fabric** gown with lace (width 1") on the front folds round the neck and around the sleeves with lace and the logo of the University. Cap of black handloom fabric with golden tassel and mortar band. | |
| | **7.2. <u>Master's Degree</u>**<br>7.2.2. **For Master's degree in School of Physical and Mathematical Sciences; School of Computer Science and Informatics; School of Engineering and Technology; School of Life-long Learning; and School of Chemical Sciences:** Black handloom fabric gown and hood-golden with black lining.<br>7.2.3. **For Master's degree in School of Earth, Environment and Space Studies, School of Agriculture and Allied (Agro based technological) Sciences, School of Medical Sciences; and School of Life Sciences:** Black handloom fabric gown and hood-red with black lining.<br>**7.3. Degree of Master of Philosophy (M.Phil.)**<br>7.3.1. **For the degree of Master of Philosophy in School of Arts, Humanities and Social Sciences; School of Language, Linguistics, Culture and Heritage; School of Journalism, Mass Communication and Media; School of Law, Governance, Public Policy and Management and School of Education**: Black handloom fabric gown and hood-blue with white lining.<br>7.3.2. **For the degree of Master of Philosophy in School of Physical and Mathematical Sciences; School of Computer Science and Informatics; School of Engineering and Technology; and School of Chemical Sciences**: Black handloom fabric gown and hood-purple with black lining.<br>7.3.3. **For the degree of Master of Philosophy in School of Earth, Environment and Space Studies; School of Agriculture and Allied (Agro-based technological) Sciences; School of Medical Sciences; and School of Life Sciences:** Black handloom fabric gown and hood-green with black lining.<br>**7.4. Degree of Doctor of Philosophy (Ph.D.)**<br>7.4.1. **For the degree of Doctor of Philosophy in School of Arts, Humanities and Social Sciences;** | For all degree recipients, following is the dress code:<br>1. White kurta, pyjama/pants for males.<br>2. Off white saree with a Mehroom/Red border (Two Inches) or off white kurta, salwar/ churidar/ pants for females.<br>3. Off white color scarf provided by the University.<br>4. Formal footwear. |

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| **School of Language, Linguistics, Culture and Heritage; School of Journalism, Mass Communication and Media; School of Law, Governance, Public Policy and Management and School of Education**: Grey handloom fabric gown with maroon facing and with maroon band on the sleeves. Hood-Grey handloom fabric with maroon lining.<br>7.4.2. **For the degree of Doctor of Philosophy in School of Physical and Mathematical Sciences; School of Computer Science and Informatics; and School of Chemical Sciences**: Grey handloom fabric gown with red facing and with red band on the sleeves. Hood-Grey handloom fabric with red lining.<br>7.4.3. **For the degree of Doctor of Philosophy in School of Earth, Environment and Space Studies; School of Agriculture and Allied (Agro-based technological) Sciences; and School of Life Sciences**: Grey handloom fabric gown with blue facing and with blue band on the sleeves. Hood-Grey handloom fabric with blue lining.<br>7.4.4. **For the degree of Doctor of Philosophy in School of Engineering and Technology and School of Life-long Learning:** Grey handloom fabric gown with violet facing and with violet band on the sleeves. Hood-Grey handloom fabric with violet lining.<br>7.4.5. **For the degree of Doctor of Philosophy in School of Medical Sciences:** Grey handloom fabric gown with green facing with green on the sleeves. Hood-Grey handloom fabric with green lining.<br>**Note:** *All the Academic Robes of the members of the Academic Procession and the candidates shall be made of Handloom Fabric* | **Note:** The *Scarf shall be made of Handloom Fabric.* |
| **8. Procedure of Convocation:**<br>**8.4.** The Chancellor, the Chief Guest, the Vice Chancellor, the Pro-Vice Chancellor (if any), the Registrar, the Deans of Schools, the Controller of Examinations, the Finance Officer and the members of the University authorities shall wear their special convocation dress as prescribed by the University. | **8. Procedure of Convocation:**<br>**8.4** The Chancellor, the Chief Guest, **the Special Guest, Guest(s) of Honour**, the Vice Chancellor, the Pro-Vice Chancellor (if any), the Registrar, the Deans of Schools, the Controller of Examinations, the Finance Officer and the members of the University authorities shall wear their special convocation dress as prescribed by the University. |

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| | **8.5.** The Chancellor, the Chief Guest, the Vice Chancellor, the Pro-Vice Chancellor (if any), the Registrar, the Deans, the Controller of Examinations, the Finance Officer and the members of the University authorities shall assemble in the meeting room/robing area at the appointed hour and shall walk in procession in the following order to the Convocation Hall:<br>**Members of the Procession:**<br>➢ The Registrar<br>➢ The Deans<br>➢ The Academic Council<br>➢ The Executive Council<br>➢ The Court<br>➢ The Finance Officer<br>➢ The Controller of Examinations<br>➢ The Pro-Vice Chancellor<br>➢ The Vice Chancellor<br>➢ The Chief Guest<br>➢ The Chancellor | **8.5** The Chancellor, the Chief Guest, **the Special Guest, Guest(s) of Honour,** the Vice Chancellor, the Pro-Vice Chancellor (if any), the Registrar, the Deans, the Controller of Examinations, the Finance Officer and the members of the University authorities shall assemble in the meeting room/robing area at the appointed hour and shall walk in procession in the following order to the Convocation Hall:<br>**Members of the Procession:**<br>➢ The Registrar<br>➢ The Deans<br>➢ The Academic Council<br>➢ The Executive Council<br>➢ The Court<br>➢ The Finance Officer<br>➢ The Controller of Examinations<br>➢ The Pro-Vice Chancellor<br>➢ The Vice Chancellor<br>➢ **Guest(s) of Honour**<br>➢ **Special Guest**<br>➢ The Chief Guest<br>➢ The Chancellor |
| | **8.8.** The Chancellor, the Chief Guest, the Vice Chancellor, the Pro-Vice Chancellor, the Registrar, the Deans, the Controller of Examinations, the Finance Officer, the members of University Authorities shall take their seats in places reserved for them. | **8.8** The Chancellor, the Chief Guest, **the Special Guest, Guest(s) of Honour,** the Vice Chancellor, the Pro-Vice Chancellor, the Registrar, the Deans, the Controller of Examinations, the Finance Officer, the members of University Authorities shall take their seats in places reserved for them. |

4. Resolved that the following amendments to Ordinance-II (*DEGREE OF MASTER OF PHILOSOPHY (M. Phil.)* of the University in accordance with the University Grants Commission (Minimum Standards and Procedure for Award of M.Phil./Ph.D. Degrees) (2nd Amendment ) Regulations, 2018, notified vide Gazette Notification dated 16-10-2018, be approved and recommended to the Executive Council for approval:

| Existing Clause | Proposed Clause |
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| Clause 3.2: Admission shall be based on the performance of the qualified candidates in an interview/viva-voce to be organised by the Department where the candidates shall be required to discuss their research interest/area | Clause 3.2: Admission shall be based on the performance of the qualified candidates in an interview/viva-voce to be organised by the Department where the candidates shall be required to discuss their research interest/area through a presentation before a duly constituted Departmental Research Committee (DRC). |

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| | through a presentation before a duly constituted Departmental Research Committee (DRC) | **Provided that for selection of candidates, a weightage of 70% to the entrance test and 30% to the performance in the Interview/ viva-voce shall be given.** |

5. Resolved that the following amendments to Ordinance-II-A (*DEGREE OF DOCTOR OF PHILOSOPHY (Ph.D.)*) of the University in accordance with the University Grants Commission (Minimum Standards and Procedure for Award of M.Phil./Ph.D. Degrees) (2nd Amendment ) Regulations, 2018, notified vide Gazette Notification dated 16-10-2018, be approved and recommended to the Executive Council for approval:

| Existing Clause | Proposed Clause |
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| **Clause 3.1.2:** The admission shall be based on the performance of the qualified candidates in the interview/viva-voce to be organised by the Department concerned where the candidates shall be required to discuss their research interest/area through a presentation before a duly constituted Departmental Research Committee. | **Clause 3.1.2:** The admission shall be based on the performance of the qualified candidates in the interview/viva-voce to be organised by the Department concerned where the candidates shall be required to discuss their research interest/area through a presentation before a duly constituted Departmental Research Committee.<br>**Provided that for selection of candidates, a weightage of 70% to the entrance test and 30% to the performance in the Interview/ viva-voce shall be given.** |

6. Academic Council reviewed the issue of inclusion of a provision for allowing the ex-students to repeat the Internal Assessment and upon deliberations it was decided that the ex-students cannot be allowed to repeat the Internal Assessment.

The Academic Council further resolved to resubmit the following Amendments to Ordinance-XXX (*PROGRAMME LEADING TO THE AWARD OF THE CERTIFICATE/ DIPLOMA/ ADVANCED DIPLOMA/DEGREE OF BACHELOR OF VOCATION (B.VOC.)*) of the University, to the Executive Council for consideration and approval:

| Existing Clause | Proposed Clause |
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| **15. Promotion and Eligibility for the Examination**<br>A student who has appeared in the first semester examination shall be promoted to the second semester, irrespective of his/her performance in the first semester examination.<br>**15.1** A semester shall be promoted to 3rd semester only when he/she has declared at least 50% of the prescribed courses of 1st & 2nd semester, taken together at the end of the second semester. A student failing to clear at least 50% of the prescribed course of 1st and 2nd semester will be treated as 'Ex-student' and will be allowed to re- | **15. Promotion and Eligibility for the Examination**<br>**15.1** "A student will be promoted from an odd semester to the next even semester without any restrictions on the minimum number of credits earned. However for promotion from an even semester to the next odd semester, a student should have earned at least 50% of the credits of all previous semesters taken together. A student failing to earn at least 50% of the credits from the prescribed courses of all previous semesters taken together will be treated as an 'Ex-student' and will be allowed to repeat in the end semester examination/skill assessment of the previous semesters as applicable (for example, for a student going from semester 4 to 5 who becomes an Ex-student, he/she shall be required to repeat all the papers of semester 3 and semester 4 in the next odd/even semester). However such student will not be allowed to repeat the internal assessment for the said |

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| | appear in the end semester examination of the 1st and 2nd semester, or both as applicable. However, such students will not be allowed to repeat internal assessment. After passing the said semesters, the student will not be promoted to 3rd semester and shall be treated as a regular student. | paper/s of the respective semester/s as the case may be. After passing the said semesters, the student shall be promoted to the next odd semester and shall be treated as a 'Regular' student.<br>**15.2** A students shall be declared to have passed the program of study and award of the degree if he/she has secured the required credits with at least P grade. |
| 7. | Resolved that the Regulations for the conduct of the meetings of the Academic Council under Section 29 of the Central Universities Act, 2009, be approved.<br>**(Annexure-I, Page No- 11 to 12 )** | |
| 8. | Resolved that the recommendations of the Board of Studies dated 15-12-2018 and School Board dated 08.02.2019 of the School of Education, for revision of the Scheme of B.Ed. and M.Ed. w.e.f. Academic Session 2019-20, be approved.<br>**(Annexure-II, Page No- 13 to 31 )** | |
| 9. | Resolved that the recommendations of the Board of Studies dated 15-12-2018 and School Board dated 08.02.2019 of the School of Education, for revision in Syllabus of fourth Semester of the B.Ed. Programme, be approved.<br>**(Annexure-III, Page No- 32 to 101 )** | |
| 10. | Resolved that the recommendations of the Board of Studies dated 15-12-2018 and School Board dated 08.02.2019 of the School of Education, for revision in Syllabus of fourth Semester of the M.Ed. Programme, be approved.<br>**(Annexure-IV, Page No- 102 to 161 )** | |
| 11. | Resolved that the recommendations of the Board of Studies dated 15-12-2018 and School Board dated 08.02.2019 of the School of Education, for revision of the Scheme and Syllabus of B.Ed. Programme, including GECs (Academic Session 2018-20) of Semester-II, be approved.<br>**(Annexure-V, Page No- 162 to 246 )** | |
| 12. | Resolved that the recommendations of the Board of Studies dated 15-12-2018 and School Board dated 08.02.2019 of the School of Education, for revision of the Scheme and Syllabus of M.Ed. Programme, including GECs (Academic Session 2018-20) of Semester-II, be approved.<br>**(Annexure-VI, Page No- 247 to 285 )** | |
| 13. | Resolved that the recommendations of the Board of Studies dated 17-12-2018 of the Department of Mathematics and School Board of School of Physical and Mathematical Sciences dated 14.02.2019, recommending scheme and syllabi of course work for Ph.D. programme in Mathematics, be approved.<br>**(Annexure-VII, Page No- 286 to 303 )** | |
| 14. | Resolved that the recommendations of the Board of Studies dated 17-12-2018 of the Department of Mathematics and School Board of School of Physical and Mathematical Sciences dated 14.02.2019, for revision of scheme and syllabi of M.Sc. Mathematics programme w.e.f Academic Session 2019-20, be approved.<br>**(Annexure-VIII, Page No- 304 to 352 )** | |
| 15. | Resolved that the proposal for the scheme and syllabi of course work for Ph.D. programme in Physics, be referred back for approval by the Board of Studies. | |
| 16. | Resolved that the recommendations of the Board of Studies dated 11-02-2019 and School Board of School of Engineering and Technology dated 13.02.2019, for revision of Scheme of Studies, Examination and syllabi of the B.Tech (1st Year) for all branches, w.e.f the Academic Session 2019-20, be approved.<br>**(Annexure-IX, Page No- 353 to 399 )** | |

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| 17. | Resolved that the recommendations of the Board of Studies dated 11-02-2019 of the Department of Electrical Engineering and School Board of School of Engineering and Technology dated 13.02.2019, for revision of Scheme of Studies, Examination and syllabi of the 2nd Year of B.Tech (Electrical Engineering), w.e.f the Academic Session 2019-20, be approved.<br>**(Annexure-X, Page No- 400 to 432 )** |
| 18. | Resolved that the recommendations of the Board of Studies dated 13-02-2019 of the Department of Civil Engineering and School Board of School of Engineering and Technology dated 13.02.2019, for revision of Scheme of Studies, Examination and syllabi of the 2nd Year of B.Tech (Civil Engineering), w.e.f the Academic Session 2019-20, be approved.<br>**(Annexure-XI, Page No- 433 to 465 )** |
| | **REPORTING ITEMS** |
| 19. | The action taken by the Vice-Chancellor on 30.01.2019, in approving Adoption/ Implementation of 10% reservation for the Economically Weaker Sections (EWSs) for admissions in the University, in compliance with the UGC Letter No. F.No.81-1/2019 (CU) dated 18.01.2019, was reported, recorded and confirmed.<br>**(Annexure-XII, Page No- 466 to 468 )** |
| 20. | The action taken by the Vice-Chancellor on 05.02.2019, in approving introduction of Ph.D. programmes in the following Departments from the Academic Session 2019-20, was reported, recorded and confirmed:<br>1. Department of Mathematics<br>2. Department of Biochemistry<br>3. Department of Physics<br>4. School of Education (to be conducted along-with Department of Education)<br>5. Mathematics under School of Engineering and Technology (to be conducted under Department of Mathematics)<br>6. Chemistry under School of Engineering and Technology (to be conducted under Department of Chemistry) |
| 21. | The action taken by the Vice-Chancellor on 30.01.2019, in adopting the revised rates of Honorarium of Guest Faculty engaged in various departments of the University, to Rs. 1500/- per lecture subject to a maximum of Rs. 50,000/- per month w.e.f. 28.01.2019, in compliance with the UGC Letter No. F.25-1/2018(PS/MISC.) dated 28.01.2019, was reported, recorded and confirmed.<br>**(Annexure-XIII, Page No- 469 to 470 )** |
| 20. | The action taken by the Vice-Chancellor on 11.02.2019 in approving the list of students/ scholars for award of Gold Medal in Fifth Annual Convocation-2019, on the basis of the following guidelines recommended by Committee, was reported, recorded and confirmed:<br>a) He/She shall be topper in respective programme by CGPA.<br>b) He/She should have obtained minimum CGPA of 8.00.<br>c) He/She should not have any backlog/Reappear in any semester during his respective programme.<br>d) There should not be any semester gap without any justifiable reasons.<br>e) There should not be any case of unfairmeans/ indiscipline during the programme of study against the student.<br>f) In case of tie between two or more students, the overall percentage shall be taken as next criterion for selection. |

| Under any other Items | |
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| 21. | Resolved that the recommendations of the Board of Studies dated 13-02-2019 of the Department of Civil Engineering and School Board of School of Engineering and Technology dated 13.02.2019, for revision of Scheme of Studies, Examination and syllabi of the 2nd Year of B.Tech (Printing & Packaging Technology), w.e.f the Academic Session 2019-20, be approved.<br>**(Annexure-XIV, Page No- 471 to 506 )** |
| 22. | Resolved that the recommendations of the Board of Studies dated 13-02-2019 of the Department of Civil Engineering and School Board of School of Engineering and Technology dated 13.02.2019, for revision of Scheme of Studies, Examination and syllabi of the 2nd Year of B.Tech (Computer Science Engineering), w.e.f the Academic Session 2019-20, be approved.<br>**(Annexure-XV, Page No- 507 to 527 )** |
| 23. | The Council authorised the Vice-Chancellor to take necessary preliminary steps required to be taken for introduction of new programmes in the existing/ proposed new departments, subject to approval of the University Grants Commission and respective Regulatory Bodies, wherever necessary. |
| | The meeting ended with a vote of thanks to the Chair. |

**VICE-CHANCELLOR**
**(Chairperson)**

**REGISTRAR**
**(Secretary)**

**Annexure-I**

# Regulations for the Conduct of the Meetings

## THE ACADEMIC COUNCIL

**(Under Section 29 of the Central Universities Act, 2009)**

*(In the Regulations the "Vice-Chancellor" includes in his absence the "Pro-Vice-Chancellor/ the person acting as Vice-Chancellor")*

1.

(i) Meetings of the Academic Council shall be convened by the Vice-Chancellor at any time.

But on a requisition signed by any ten members of the Academic Council to convene a special meeting thereof, the Vice-Chancellor shall convene a special meeting on a date fixed by him/her. At such meetings only such subjects as the signatories to the requisition have set forth in the requisition shall first be brought forward and disposed of.

(ii) The Registrar shall, ordinarily, at least seven days before each meeting of the Academic Council, issue to each member thereof, a notice convening the meeting and a copy of the Agenda thereof:

Provided that in the case of emergent meetings the Vice-Chancellor may suspend or modify the operation of this rule.

(iii) The Vice-Chancellor shall be the Chairperson of the Academic Council. In his/her absence, the Pro-Vice-Chancellor/ the person acting as Vice-Chancellor shall be the Chairperson, and in the absence of both, the Council shall elect its own Chairperson for the meeting from amongst the members present.

(iv) At all meetings of the Academic Council, half of the total members of the Academic Council shall form a quorum.

(v) If at a meeting of the Academic Council the quorum is not complete, the Chairperson may dissolve or adjourn the meeting.

(vi) Business not included in the Agenda as sent to the members may only be taken up by permission of the Chairperson.

(vii) The Registrar shall be the ex-officio Secretary. In the absence of the Registrar, person performing the duties of the Registrar shall act as Secretary.

(viii) All proposals brought forward for consideration of the Academic Council, shall be decided by majority of votes. The Chairperson may decide that any matter may be so decided by a secret ballot or by the show of hands at his discretion.

(ix) Every resolution shall be passed by a majority of the votes of the members present. It shall be in the option of the Chairperson to decide the manner in which the votes of the members shall be recorded.

(x) In the case of equality of votes, the Chairperson shall have the casting vote in addition to his vote as a member.

(xi) No resolution, proposal or other matter, foreign to, or wholly inconsistent with, the matter appearing in the Agenda papers shall be decided by the Academic Council, except to the extent permitted by the Chairperson whose decision on the subject shall be final.

(xii) It shall be in the power of the Chairperson to regulate the order of the speeches.

(xiii) A member shall have the right to express his/her dissent if he/she does not agree to any resolution of the Council. This will be mentioned at the end of such resolution that one or more members dissented.

(xiv) If the Chairperson is of the opinion that a point of order has been raised by a member vexatiously, or for the purpose of mere obstruction, or of interruption to the business of the meeting, he/she shall so declare, and it shall be deemed a breach of order.

(xv) The Chairperson shall be the sole judge of any point of order and may, at his/her own instance, or at the instance of any member, call to order any member who is speaking. If the member who is called to order disregards such call, the Chairperson may suspend him/her from membership for the rest of the meeting, and in case of gross misbehavior he/she may, with the consent of two-thirds of members present at the meeting suspend him/her for such longer time as he/she may consider necessary. No member may be suspended longer than the duration of the meeting without the vote of two-third of the members present.

(xvi) A member suspended for the rest of the sitting shall not take part in any discussion but may remain present at the meeting.

(xvii) A member suspended with the vote of two-thirds of the members present, for a longer period than the duration of a meeting, may be called upon to withdraw from the meeting, and thereupon, he/she shall do so.

(xviii) The Registrar shall circulate the draft minutes of the meeting of the Council to the members as soon as possible to seek their comments, if any, within seven days. The comments received shall be examined and if necessary, minutes shall be suitably amended.

(xix) If no comments are received from any member within the stipulated time, the minutes shall be finalized and circulated for appropriate action on the resolutions.

(xx) The minutes shall be placed before the next meeting of the Council for confirmation.

Annexure-II

हरियाणा केंद्रीय विश्वविद्यालय
(संसद अधिनियम संख्या 25 (2009) के तहत स्थापित)
जांट-पाली, महेंद्रगढ़ (हरियाणा) - 123031

CENTRAL UNIVERSITY OF HARYANA
(Established vide Act No. 25 (2009) of Parliament)
Jant-Pali, Mahendergarh (Haryana)-123031

फोन / Phone : 01285-249401 वेबसाइट / Website : www.cuh.ac.in

सं. / No.CUH/20 दिनांक / Dated:.....

# School of Education

Minutes of the meeting of Board of Studies held on 15-12-2018 at 10.30 a.m. in the Conference Room of the School of Education, Central University of Haryana. The following members were present:

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| **Dr. Parmod Kumar**<br>Dean, School of Education,<br>Central University of Haryana | Chairperson |
| **Prof. R.S. Khan**<br>Former Vice-Chairman, NCTE &<br>Former Dean, Faculty of Education &<br>Head ISC, Jamia Milia University New Delhi | Member<br>(Expert) |
| **Prof. S. V. S. Chaudhary**<br>Former Vice-Chairman, NCTE &<br>Former Director, School of Education,<br>IGNOU, New Delhi. | Member<br>(Expert) |
| **Prof. Neerja Dhankar**<br>Professor, School of Education,<br>Central University of Haryana | Member |
| **Dr. Anoj Raj**<br>Associate Professor,<br>School of Education,<br>Central University of Haryana | Member |
| **Dr. Rubul Kalita**<br>Assistant Professor,<br>School of Education,<br>Central University of Haryana | Member |

Dr. Parmod Kumar, Chairperson, Board of Studies initiated the meeting with a note of welcome to all the members. Following issues were taken up in the Meeting as per the agenda already notified.

| Sr. No. | Agenda Item | Decision Taken by BoS |
|---|---|---|
| 1. | **To Confirm the Minutes of the Meeting of Previous Board of Studies of School of Education held on 24/8/2018 (Annexure-I).** | Committee confirmed the minutes of previous meeting of Board of Studies, School of Education held on 24-08-2018. Action Taken Report on the suggestions made in previous BoS meeting was |

| | | |
|---|---|---|
| | | presented before the members of the BoS. They were convinced and approved the same were appended at **Annexure-I**. Action taken Report was noted. |
| 2. | **To consider the Pattern of Question Papers of 2 Credit Course for End Term Examination of Semesters I and III of B.Ed. & M.Ed. Programme.** | The BoS approved the **Pattern of Question Papers of 2 Credit** course for the End Term Examination of**Semester I and III of** B.Ed. and M.Ed. programmes. It was decided that the Question Paper will have 35 marks with the suggestion that word limit of Question No. 1 i.e. of Short Answer Type should be about 200 words and for Question No. 2 & 3 should be about 500 words **(Annexure-II)**. |
| 3. | **To consider the Revised Syllabus of B.Ed. Programme of Semesters- IV for the Academic Session 2017-19 (Annexure-III).** | The contents of the syllabus for the Semester- IV of the B.Ed. programme for the session 2017-19 were discussed extensively. The members approved the Revised Syllabus of **B.Ed. Programme of Semester- IV for the Academic Session 2017-19**with the suggestions of revisiting the objectives of the papers, to be incorporated is appended at **Annexure-III**. |
| 4. | **To consider the Revised Scheme of the B.Ed. Programme for the Academic Session 2018-20 and Syllabus of Semester-II of Session 2018-20.** | The revised scheme and the contents of the syllabus of the Semester- II of the B.Ed. programme for the session 2018-20 were discussed extensively. The members approved the Revised Scheme and the Syllabus of **B.Ed. Programme of Semester- II for the Academic Session 2018-20** with some suggestions to be incorporated is appended at **Annexure-IV**. |
| 5. | **To consider the Revised Syllabus of M.Ed. Programme of Semester-IV for the Academic Session 2017-19.** | The syllabus for the Semester- IV of the M.Ed. programme for the session 2017-19 was deliberated. The members approved the Revised Syllabus of **M.Ed. Programme of Semester- IV for the Academic Session 2017-19** with some suggestions **( Annexure-V)**. |
| 6. | **To consider the Revised Scheme of M.Ed. Programme (Two Years) for the Academic Session 2018-20 and Syllabus of Semester-II of the session 2018-20.** | The revised scheme and the syllabus of the Semester-II of the M.Ed. programme for the session 2018-20 was deliberated. The members approved the Revised Scheme and the Syllabus of **M.Ed. Programme of Semester- II for the Academic Session 2018-20** with some suggestions **(Annexure-VI)**. |
| 7. | **To consider the Panel of Paper Setters and Practical Examiners of B.Ed. & M.Ed. Programme of Semester-II for the Session 2018-20 and Semester-IV of the Session 2017-19.** | The panel of paper setters and practical examiners for evaluation of B.Ed. and M.Ed. Programmes of Semester-II for the Session 2018-20 and Semester-IV of the Session 2017-19 was considered and approved **(Annexure-VII)**. |

| | | |
|---|---|---|
| 8. | **Any other item with the permission of the Chairperon, Board of Studies, School of Education, Central University of Haryana** | (i) The members of committee suggested that Ph.D. progrmamme in Teacher Education in the department of School of Education may introduced.<br>(ii) Orientation of faculty in Assessment may be conducted every semester/annually to incorporate best practices.<br>(iii) Teachers to create sample report of community-based work for the reference of students so that students can report their experiences properly.<br>(iv) In order to have a collection of quality recorded lectures, topics from the syllabus to be distributed among the students for presentation before the class and to record for future use.<br>(v) Teachers to design their instruction in such a way that enable optimum interaction in the class.<br>(vi) Teachers should be involved in presentation of MOOCs.<br>(vii) References to be written according to latest APA format. |

The meeting concluded with the vote of thanks to the chair.

(Prof. R.S. Khan) 15.12.2018

(Prof. S. V. S. Chaudhary) 15/12/2018

(Prof. Neerja Dhankar) 15/12/2018

(Dr. Anoj Raj) 15/12/2018

(Dr. Rubul Kalita) 15/12/2018

(Dr. Parmod Kumar) 15/12/18

हरियाणा केंद्रीय विश्वविद्यालय
(संसद अधिनियम संख्या 25 (2009) के तहत स्थापित)
जांट-पाली, महेंद्रगढ़ (हरियाणा) - 123031

CENTRAL UNIVERSITY OF HARYANA
(Established vide Act No. 25 (2009) of Parliament)
Jant-Pali, Mahendergarh (Haryana)-123031

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सं. / No.CUH/20

दिनांक / Dated: 8/2/2019

# School of Education

Minutes of the 1st Meeting of School Board of School of Education held on **8th February** (Friday), 2019 at **12:00 Noon** in the Conference Hall (Room No. 102), First Floor, Academic Block-IV, Central University of Haryana, Mahendergarh, Haryana.

The following members were present:

| | |
|---|---|
| **Dr. Parmod Kumar**<br>Dean, School of Education,<br>Central University of Haryana | Chairman |
| **Prof. R. S. Khan**<br>Former Vice-Chairman NCTE & Former, Dean Faculty of Education, IASE, Jamia Milia Islamia, New Delhi | Member |
| **Prof. Rajendra Singh Yadav**<br>Dean, Faculty of Education,<br>Kurukshetra University, Kurukshetra, Haryana | Member |
| **Prof. Kirandeep Singh**<br>Professor, Department of Education,<br>Punjab University, Chandigarh | Member |
| **Prof. Neerja Dhankar**<br>Professor, School of Education,<br>Central University of Haryana | Member |
| **Dr. Anoj Raj**<br>Associate Professor, School of Education,<br>Central University of Haryana | Member |
| **Dr. Amit Singh**<br>Assistant Professor, School of Education,<br>Central University of Haryana | Member |

Dr. Parmod Kumar, Chairman, School Board of School of Education initiated the meeting with the note of welcome to all the members. Following issues were taken up in the meeting as per the agenda already notified:

| Item No. | Agenda | Decisions taken by School Board |
|---|---|---|
| 1 | To apprise the Members of School Board of School of Education regarding the Minutes of the 1st Meeting of Board of Studies, School of Education (held on 13th April, 2018). The minutes were also approved by the Academic Council (Annexure-I). | The committee endorsed the minutes of 1st Meeting of Board of Studies, School of Education held on 13th April, 2018, which were duly approved by Academic Council. **(Annexure-I).** |

Kirandeep 8/2/19 Neerja 8/2/2019 Rajendra 8/02/2019

| | | |
|---|---|---|
| 2 | To apprise the Members of School Board of School of Education regarding Minutes of the 2nd Meeting of Board of Studies, School of Education (held on 24th August, 2018). The minutes were also approved by the Academic Council (Annexure-II). | The committee endorsed the minutes of 2nd Meeting of Board of Studies, School of Education held on 24th August, 2018, which were duly approved by the academic council. **(Annexure-II).** |
| 3 | To Confirm the Minutes of the 3rd Meeting of Board of Studies of School of Education held on 15th December, 2018 (Annexure-III). | The committee, after considering suggestions of Board of Studies regarding minor modifications in syllabus and updation of reference, confirmed and approved the minutes of 3rd Meeting of Board of Studies, School of Education held on 15th December, 2018. **(Annexure-III).** |
| 4 | To consider and endorse the suggestion of Board of Studies of School of Education (held on 15th December, 2018) to start the Ph.D. Programme in School of Education w.e.f. the Academic Session 2019-20 (Annexure-IV). | The committee appreciated endorsed and confirmed the suggestion of Board of Studies of School of Education (held on 15th December, 2018) to start the Ph.D. Programme in School of Education w.e.f. the Academic Session 2019-20. |
| 5 | To consider and approve the existing Scheme of B.Ed. & M.Ed., Semester-I already approved by Board of Studies of School of Education for the Session 2018-20 for the Academic Session 2019-21 also. | The committee confirmed and approved the existing Scheme of B.Ed. & M.Ed. for academic session 2018-20 and academic session 2019-21. |
| 6 | Any other item, with the permission of Chairperson, School Board of School of Education,<br>I. Separate ordinance for M.Ed. and B.Ed. programme as per NCTE Regulation-2014.<br>II. Change of supervisor of 04 students of M.Ed. IV Semester. | I. The committee suggested that a separate ordinance for M.Ed. and B.Ed. programme needs to be prepared in accordance with NCTE guidelines 2014, as suggested in the Board of Studies held earlier.<br>II. Change of supervisor of 04 students of M.Ed. IV Semester of Dr. Chandanbala, Assistam Professor, School of Education was approved who could not join her duties due to health reasons. Dr. Rajni will now supervise all those students. **(Annexure-IV)** |

The meeting concluded with the vote of thanks to the chair.

(Prof. R.S.Khan) 5.2.2019

(Prof. R.S.Yadav) 5.2.2019

(Prof. Kirandeep Singh)

(Prof. Neerja Dhankar) 8/2/2019

(Dr. Anoj Raj) 8/2/2019

(Dr. Amit Singh) 9.2.19

(Dr. Parmod Kumar) 9/2/19

Annexure-II

# SCHEME/COURSE STRUCTURE

## B.Ed.
## (Bachelor of Education)

## School of Education

## Academic Session : 2019-21

## Course Structure of Bachelor of Education (B.Ed.) under Choice Based Credit System for the Session 2019-21

Total No. of Credits in Four Semesters = 98 (90 + 8) (B.Ed. Course +Course offered by other Department)

### B.Ed. Semester-I

| Sl. No. | Course Code | Total Credits | Paper Tide | Total Marks | Credits (Theory/Tutorial/Practicum) | Class Teaching Hours per week | Internal Assessment Weightage | External Assessment Weightage |
|---|---|---|---|---|---|---|---|---|
| 1 | SOE020101C3104 | 4 | Childhood and Growing Up | 100 | 4 | 4 | 30% | 70% |
| 2 | SOE020102C3104 | 4 | Contemporary India and Education | 100 | 4 | 4 | 30% | 70% |
| 3 | SOE020103C3104 | 4 | Assessment for learning | 100 | 4 | 4 | 30% | 70% |
| 4 | SOE020104C3104 | 4 | Value and Peace Education | 100 | 4 | 4 | 30% | 70% |
| 5 | SOE020105C1102 | 2 | Language Across the Curriculum | 50 | 2 | 2 | 30% | 70% |
| 6 | SOE020106C1102 | 2 | Understanding Discipline and Subjects | 50 | 2 | 2 | 30% | 70% |
| 7 | SOE020107C1102 | 2 | Reading and Reflection on Text | 50 | 2 | 2 | 30% | 70% |
| 8 | | 4 | To be taken from other Department/MOOC | 100 | 4 | 4 | 30% | 70% |
| | Total | 26 | | 650 | 26 | 26 | | |
| | Practicum/Hands on/ Students Activity /Seminar/Workshop/etc; during Practicum hours | | | | | | | |
| • | • 1 Credit Theory = 16 hours in a semester<br>• 1 Credit = 25 Marks | | | | | | | |
| • | • Course Code offered to other Department in Semester I is presented in Table-1 | | | | | | | |

Table-1: List of Courses offered by the School of Education to other Departments in Semester-I and III

| Sl. No. | Course Code | Course Title | |
|---|---|---|---|
| 1 | SOE020134GEC3104 | Value Based Education | Semester I |
| 2 | SOE020135GEC3104 | Art in Education | Semester I |

## B.Ed. Semester-II

| Sl. No. | Course Code | Total Credits | Paper Title | Total Marks | Credits (Theory/Tutorial /Practicum) | Practical | Class Teaching/ Field Based Activity Hours per week | Internal Assessment Weightage | External Assessment Weightage |
|---|---|---|---|---|---|---|---|---|---|
| 1 | SOE020208C3104 | 4 | Learning and Teaching | 100 | 4 | 0 | 4 | 30% | 70% |
| 2 | SOE020209C3104 | 4 | Knowledge and Curriculum | 100 | 4 | 0 | 4 | 30% | 70% |
| 3 | SOE020210C3104 – SOE020217C3104 | 4 | Pedagogy of School Subject-1* | 100 | 4 | 0 | 4 | 30% | 70% |
| 4 | SOE020210C3104 – SOE020217C3104 | 4 | Pedagogy of School Subject-2* | 100 | 4 | 0 | 4 | 30% | 70% |
| 5 | SOE020218C2024 | 4 | Drama and Art in Education | 100 | 2 | 2 | 6 | 30% | 70% |
| 6 | SOE020219C0022 | 2 | Critical Understanding of ICT | 50 | 0 | 2 | 4 | 30% | 70% |
| 7 | SOE020220C0044 | 4 | School Internship** | 100 | 0 | 4 | 8 | 60% | 40%* |
| | **Total** | **26** | | **650** | **18** | **8** | **34** | | |

**Practicum/Hands on/ Students Activity /Seminar/Workshopetc. during Practicum hours**

- **1Credit Theory = 16 hours in a semester**
- **1 Credit = 25 Marks**
- ***Pedagogy of School Subject-1* & Subject-2* may choose from List given below in Table-2.**
- ****Students will be engaged with school for the four weeks during the Semester.**

**Course Code offered to other Department in Semester II is presented in Table-3**

Table-2: List of Pedagogical Courses* offered by the School of Education in I[st] Year (Semester II)

| Sl. No. | Course Code | Course Title |
|---|---|---|
| 1 | SOE020210C3104 | Pedagogy of Hindi |
| 2 | SOE020211C3104 | Pedagogy of English |
| 3 | SOE020212C3104 | Pedagogy of Social Sciences |
| 4 | SOE020213C3104 | Pedagogy of Mathematics |
| 5 | SOE020214C3104 | Pedagogy of Life Science |
| 6 | SOE020215C3104 | Pedagogy of Physical Science |
| 7 | SOE020216C3104 | Pedagogy of Economics |
| 8 | SOE020217C3104 | Pedagogy of Commerce |

Table-3: List of Courses offered by the School of Education to other Departments in Semester-II

| Sl. No. | Course Code | Course Title | Semester |
|---|---|---|---|
| 1 | SOE020236GEC2024 | ICT in Education | Semester II |
| 2 | SOE020237GEC2024 | Essentials of Guidance and Counseling | Semester II |
| 3 | SOE020238GEC2024 | Performing and Visual Arts | Semester II |

## B.Ed. Semester-III

| Sl.No. | Course Code | Total Credits | Paper Title | Total Marks | Credits (Theory/Tutorial/ Practicum) | Practical | Class Teaching/ Field Based Activity Hours per week | Internal Assessment Weightage | External Assessment Weightage |
|---|---|---|---|---|---|---|---|---|---|
| 1 | SOE020321C001616 | 16 | School Internship* | 400 | 0 | 32 | 32 | 60% | 40% |
| 2 | | 4 | *To be taken from other Department/MOOC | 100 | 4 | 0 | 4 | 30% | 70% |
| | Total | 20 | | 500 | 4 | 32 | 36 | | |

**Practicum includes lesson planning/ Engagement with the field/ Hands-on experience/activities/seminars/workshops etc.**

courses for advanced level pedagogy ( senior secondary level) can be offered to post graduates in a school subject.

@ internship + school and community-based activities ( credits 14+2) = Marks 350+50=400

**Note: During School Internship School and Community-Based Activities may be arranged in terms of resources available in the teacher education institutions/university.**

***School Internship will be treated as Practicum Course.**

**1Credit Theory = 16 hours in a semester**

**1 Credit = 25 Marks**

*** Students will be engaged with school for 16 weeksduring the Semester.**

***Courses offered by the other Department: maximum -4 Credits**

## B.Ed. Semester-IV

| Sl.No. | Course Code | Total Credits | Paper Title | Total Marks | Credits (Theory/Tutorial/ Practicum) | Practical | Class Teaching/ Field Based Activity Hours per week | Internal Assessment Weightage | External Assessment Weightage |
|---|---|---|---|---|---|---|---|---|---|
| 1 | SOE020422C3104 | 4 | Gender, School and Society | 100 | 4 | 0 | 4 | 30% | 70% |
| 2 | SOE020423C3104 | 4 | Transaction of Curriculum: Issues & Challenges | 100 | 4 | 0 | 4 | 30% | 70% |
| 3 | SOE020424C3104 | 4 | Creating an Inclusive School | 100 | 4 | 0 | 4 | 30% | 70% |
| 4 | SOE020425C1102 | 2 | Understanding the Self | 50 | 2 | 0 | 2 | 30% | 70% |
| 5 | SOE020426C1102 | 2 | Environmental Education | 50 | 2 | 0 | 2 | 30% | 70% |
| 6 | SOE020427C2024 | 4 | Yoga Education | 100 | 2 | 2 | 6 | 30% | 70% |
| 7 | SOE020428DCEC1102-SOE020433DCEC1102 | 2 | Optional Course*-1 | 50 | 2 | 0 | 2 | 30% | 70% |
| 8 | SOE020428DCEC1102-SOE020433DCEC1102 | 2 | Optional Course*-2 | 50 | 2 | 0 | 2 | 30% | 70% |
| | **Total** | **24** | | **600** | **22** | **2** | **24** | | |

**Practicum/Hands on/ Students Activity /Seminar/Workshop/etc; during Practicum hours**

- **1Credit Theory = 16 hours in a semester**
- **1 Credit = 25 Marks*Optional Course may choose from Table-4.**

**Course Code offered to other Department in Semester IV is presented in Table-5**

**Table-4: List of Optional Courses offered by the School of Education in 2nd Year (Semester IV)**
**Choose any two from the following List**

| Sl. No. | Course Code | Course Title |
|---|---|---|
| 1 | SOE020428DCEC1102 | Educational Administration and Management |
| 2 | SOE020429DCEC1102 | Life Skills Education |
| 3 | SOE020430DCEC1102 | Guidance and Counselling |
| 4 | SOE020431DCEC1102 | Health &Physical Education |
| 5 | SOE020432DCEC1102 | Education in Indian Constitution |
| 6 | SOE020433DCEC1102 | Comparative Education |

**Table-5: List of Courses offered by the School of Education to other Departments in Semester-IV**

| Sl. No. | Course Code | Course Title | Semester |
|---|---|---|---|
| 1 | SOE020439GEC3104 | Educational Management and Leadership | Semester IV |
| 2 | SOE020440GEC3104 | Peace Education | Semester IV |

# SYLLABUS

## M.Ed.
## (Master of Education)

## School of Education
## (Academic Session: 2019-20)

## Central University of Haryana

## Course Structure of Master of Education (M.Ed.) under Choice Based Credit System (Academic Session: 2019-20)

### Total No. of Credits in Two Years= 90+8=98

### M.Ed. Semester- I

| S. No. | Course Credit | Course Code | Course Title | Total Marks | Credits (Theory/ Tutorial/ Practicum) | Practical | Class Teaching / Field Based Activity Hours per week | Internal Assessment Weightage | External Assessment Weightage |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 4 | SOE010101C3014 | Psychology of Learning and Development | 100 | 4 | 0 | 4 | 30% | 70% |
| 2 | 4 | SOE010102C3014 | Historical, Political & Economic Foundations of Education | 100 | 4 | 0 | 4 | 30% | 70% |
| 3 | 4 | SOE010103C3014 | Educational Studies | 100 | 4 | 0 | 4 | 30% | 70% |
| 4 | 4 | SOE010104C3014 | Introduction to Educational Research | 100 | 4 | 0 | 4 | 30% | 70% |
| 5 | 2 | SOE010105C0022 | ICT in Education | 50 | 0 | 2 | 4 | 60% | 40% |
| 6 | 2 | SOE010106C0022 | Development of Self: Yoga Education | 50 | 0 | 2 | 4 | 60% | 40% |
| 7 | 2 | SOE010107C0022 | Dissertation Part-I | 50 | 0 | 2 | 4 | 60% | 40% |
| 8 | 4 | | **Taken from other Department/ MOOC** | 100 | 4 | 0 | 4 | 30% | 70% |
| **Total** | **26** | | | **650** | **20** | **6** | **32** | | |

**Practicum/ Hands on/ students Activity / Seminar/ Workshop/etc; during Practicum hours** **Number of days=100**

- **1 credit Theory/ Tutorial/ Practicum=16 hours in a semester**
- **1 credit practical=32 hours in a semester**
- **1 credit=25 Marks**
- Viva-Voice exam for course 05 will be conducted by the external examiner at the end of the semester and weightage will be 40% external & 60% Internal.
- Practical Examination for Course No. 6 & 7 will be 40% external & 60% Internal.
- **A student has to take 4 credits General Elective Course from other department course/ MOOC approved by C.U.H/ U.G.C**
- **General Elective Courses Offered by M.Ed. to other department : Personality Development (4 Credits)**

## M.Ed. Semester- II

| S. No. | Course Credit | Course Code | Course Title | Total Marks | Credits (Theory/ Tutorial/ Practicum) | Practical | Class Teaching / Field Based Activity Hours per week | Internal Assessment Weightage | External Assessment Weightage |
|---|---|---|---|---|---|---|---|---|---|
| 9 | 4 | SOE010208C3014 | Philosophical Foundations of Education | 100 | 4 | 0 | 4 | 30% | 70% |
| 10 | 4 | SOE010209C3014 | Sociological Foundations of Education | 100 | 4 | 0 | 4 | 30% | 70% |
| 11 | 4 | SOE010210C3014 | Curriculum Studies | 100 | 4 | 0 | 4 | 30% | 70% |
| 12 | 4 | SOE010211C3014 | Teacher Education | 100 | 4 | 0 | 4 | 30% | 70% |
| 13 | 2 | SOE010212C0022 | Academic Writing | 50 | 0 | 2 | 4 | 60% | 40% |
| 14 | 2 | SOE010213C0022 | Internship and Field Attachment | 50 | 0 | 2 | 4 | 60% | 40% |
| 15 | 2 | SOE010214C0022 | Dissertation Part-II | 50 | 0 | 2 | 4 | 60% | 40% |
| 16 | 4 | | **Taken from other Department / MOOC** | 100 | 4 | 0 | 4 | 30% | 70% |
| **Total** | **26** | | | **650** | **20** | **06** | **32** | | |

**Practicum/ Hands on/ Students Activity / Seminar/ Workshop/etc; during Practicum hours** **Number of days=100**

- **1 credit Theory/ Tutorial/ Practicum=16 hours in a semester**
- **1 credit practical=32 hours in a semester**
- **1 credit=25 Marks**
- **Viva-Voce exam for course 13, 14 & 15 will be conducted by the external examiner at the end of the semester and weightage will be 40% external & 60% Internal.**

**Internship Programme :**

- Internship should be organized in such way that all students' engagement for a continuous period of 2 weeks in a teacher education institute for field experience associated with the specialization choose. Since the M.Ed. programme structure proposed in this reports is associated on schools and teacher education institutions (and other sites) based activity, the M.Ed. calendar should be development keeping in mind the schedule of these institutions.
- **A student has to take 4 credits General Elective Course from other department course/ MOOC approved by C.U.H/ U.G.C**
- **General Elective Courses Offered by M.Ed. to other department : Introduction to Academic Writing (4 Credits);**
  **: Educational Leadership and Management (4 Credits)**

## M.Ed. Semester- III

| S. No. | Course Credit | Course Code | Course Title | Total Marks | Credits (Theory/ Tutorial/ Practicum) | Practical | Class Teaching / Field Based Activity Hours per week | Internal Assessment Weightage | External Assessment Weightage |
|---|---|---|---|---|---|---|---|---|---|
| 17 | 4 | SOE010315C3014 | Advance Research Methodology | 100 | 4 | 0 | 4 | 30% | 70% |
| 18 | 4 | SOE010316C3014 | Inclusive Education: Gender, Disability and Marginalization | 100 | 4 | 0 | 4 | 30% | 70% |
| 19 | 2 | **Any one of the following** | | 50 | 2 | 0 | 2 | 30% | 70% |
| | | SOE010317DCEC2002 | Institutions, Systems and Structures at Elementary Stage | | | | | | |
| | | SOE010318DCEC2002 | Institutions, Systems and Structures at Secondary Stage | | | | | | |
| 20 | 2 | **Any one of the following** | | 50 | 2 | 0 | 2 | 30% | 70% |
| | | SOE010319DCEC2002 | Stage Specific Status, Issues and Concerns at Elementary Stage | | | | | | |
| | | SOE010320DCEC2002 | Stage Specific Status, Issues and Concerns at Secondary Stage | | | | | | |
| 21 | 2 | **Any one of the following** | | 50 | 2 | 0 | 2 | 30% | 70% |
| | | SOE010321DCEC2002 | Practice Relating to Curriculum, Pedagogy and Assessment at Elementary Stage | | | | | | |
| | | SOE010322DCEC2002 | Practice Relating to Curriculum, Pedagogy and Assessment at Secondary Stage | | | | | | |
| 22 | 2 | SOE010323C2002 | Environmental Education | 50 | 2 | 0 | 2 | 30% | 70% |
| 23 | 4 | SOE010324C0044 | Internship in Specialized Area | 100 | 4 | 0 | 8 | 60% | 40% |
| 24 | 2 | SOE010325C0022 | Dissertation Part-III | 50 | 2 | 0 | 4 | 60% | 40% |
| **Total** | **22** | | | **550** | **22** | **0** | **28** | | |

**Practicum/ Hands on/ Students Activity / Seminar/ Workshop/etc; during Practicum hours** — **Number of days=100**

**1 credit Theory/ Tutorial/ Practicum=16 hours in a semester**
**1 credit practical=32 hours in a semester**
**1 credit=25 Marks**
**Viva-Voce exam for course 23 & 24 will be conducted by the external examiner at the end of the semester and weightage will be 40% external & 60% Internal.**

**General Elective Courses offered by M.Ed. to other department : Art of Teaching (4 Credits)**

## M. Ed. Semester- IV

| S. No. | Course Credit | Course Code | Course Title | Total Marks | Credits (Theory/ Tutorial/ Practicum) | Practical | Class Teaching / Field Based Activity Hours per week | Internal Assessment Weightage | External Assessment Weightage |
|---|---|---|---|---|---|---|---|---|---|
| 25 | 4 | SOE010425C3014 | Recent Trends in Teacher Education | 100 | 4 | 0 | 4 | 30% | 70% |
| 26 | 4 | **Elective Course-I (Choose any one)** | | 100 | 4 | 0 | 4 | 30% | 70% |
| | | SOE010426DCEC3014 | Educational Technology | | | | | | |
| | | SOE010427DCEC3014 | Education of the Disadvantaged Groups | | | | | | |
| | | SOE010428DCEC3014 | Personality Development and Communication Skills | | | | | | |
| | | SOE010429DCEC3014 | Educational Measurement and Evaluation | | | | | | |
| 27 | 4 | **Specialization of course -Elective-II (Choose any one)** | | 100 | 4 | 0 | 4 | 30% | 70% |
| | | SOE010430DCEC3014 | Educational Policy, Economics and Planning at Elementary Level | | | | | | |
| | | SOE010431DCEC3014 | Educational Policy, Economics and Planning at Secondary Level | | | | | | |
| 28 | 4 | **Specialization of course -Elective-III (Choose any one)** | | 100 | 4 | 0 | 4 | 30% | 70% |
| | | SOE010432DCEC3014 | Educational Management, Administration & Leadership at Elementary Level | | | | | | |
| | | SOE010433DCEC3014 | Educational Management, Administration & Leadership at Secondary Level | | | | | | |
| 29 | 4 | **Elective Course-IV (Choose any one)** | | 100 | 4 | 0 | 4 | 30% | 70% |
| | | SOE010434DCEC3014 | Value Education | | | | | | |
| | | SOE010435DCEC3014 | Distance and Open Learning | | | | | | |
| | | SOE010436DCEC3014 | Comparative Education | | | | | | |
| | | SOE010437DCEC3014 | Guidance and Counselling | | | | | | |
| 30 | 4 | SOE010439C3014 | Dissertation-Part-IV | 100 | 0 | 4 | 8 | 60% | 40% |
| Total | 24 | | | 600 | 20 | 4 | 28 | | |

- 1 credit Theory/ Tutorial/ Practicum=16 hours in a semester
- 1 credit practical=32 hours in a semester
- 1 credit=25 Marks
- Viva-Voce exam for course 29 will be conducted by the external examiner at the end of the semester and weightage will be 20% external viva-voce, 20% Internal & 60% Report writing.
- General Elective Courses offered by M.Ed. to other department
  - Introduction to Counselling (4 Credits)
  - Inclusive Education (4 Credits)

## List of General Elective Course (Offered to Other Department)

| Sr. No. | Semester | Course Code | Paper Title |
|---|---|---|---|
| 1 | First | SOE010140GEC3014 | Personality Development |
| 2 | Second | SOE010241GEC3014 | Introduction to Academic Writing |
| 3 | Second | SOE010242GEC3014 | Educational Leadership and Management |
| 4 | Third | SOE010343GEC3014 | Art of Teaching |
| 5 | Forth | SOE010444GEC3014 | Introduction to Counselling |
| 6 | Forth | SOE010445GEC3014 | Inclusive Education |

Annexure-4

# SYLLABUS

## B.Ed.

## (Bachelor of Education)

## School of Education

## Academic Session : 2017-19

## w.e.f. 03/01/2019

Annexure-III

# Course: B.Ed.
## Curriculum, Programme Implementation and Assessment

### Curriculum

The B.Ed. curriculum shall be designed to integrate the study of subject knowledge, human development, pedagogical knowledge and communication skills. The programme shall comprise three broad curricular areas: Perspective in Education, Curriculum and Pedagogic Studies, and Engagement with the Field.

The courses under each of these curricular areas will be based on a close reading of original writing, seminar/ term paper presentations and continuous engagement with the field. Transaction of the courses shall be done using a variety of approaches, such as case studies, discussions on reflective journals, observations of children and interactions with the community in multiple socio- cultural environments.

Information and Communication Technology (ICT), Gender, Yoga Education and Inclusive Education shall form an integral part of the B.Ed. curriculum.

**(i) Theory Courses**

***(a) Perspectives in Education***

Perspectives in Education should include courses in the study of childhood, child development and adolescence, contemporary India and education, philosophical and sociological perspective in education, theoretical foundations of knowledge and curriculum, teaching and learning, gender in the context of school and society and inclusive education. The course in childhood studies shall enable student-teachers to engage with studies of Indian society and education. The course in childhood studies shall enable student-teachers to engage with studies of Indian society and education, acquire conceptual tools of sociological analysis and hands-on engaging with diverse communities, children and schools. The course on 'Contemporary India and Education' shall develop a conceptual understanding about issues of diversity, inequality and marginalization in Indian society and the implications for education with analysis of significant policy debates in Indian education. The course on 'Knowledge and Curriculum' will address the theoretical foundations of school knowledge from historical, philosophical and sociological perspectives, with critical analysis of curricular aims and context, and the relationship between curriculum, policy and learning. The course on 'Teaching and Learning' will focus on aspects of social and emotional development, self and identity and cognition and learning.

***(b) Curriculum and Pedagogy Studies***

Course in Curriculum and Pedagogic Studies shall include aspects of language across the curriculum and communication understanding of a discipline, social history of a school subject and its pedagogical foundations with a focus of the learner; and a course on the theoretical perspectives on assessment for learning.

Curriculum and Pedagogic studies courses shall offer a study of the nature of a particular discipline, critical understanding of the school curriculum; pedagogy as the integration of the knowledge about the learner, the discipline and the societal context of learning, and research relating to different aspects of young children's leaning. The design of the programme would enable the students to specialize in one disciplinary area, viz. Social Science,

Science, Mathematics, Language and a subject area from the same discipline at one/two levels of school. The courses shell aim to develop in students an understanding of the curriculum, linking school knowledge with community life. A verity of investigative projects shall be included to reconstruct concepts form subjects knowledge through appropriate pedagogic process and to communicate meaningfully with children.

***(ii) Engagement with the Field/ Practicum***

The B.Ed. programme shall provide for sustained engagement with the self, the child, community and school, at different levels and through establishing close connections between different curricular areas. This curricular area would serve as an important link between the above two broad curricular through it's three components:

(a) Tasks and Assignments that run through all the courses

(b) School Internship

(c) courses on Enlacing professional Capacities

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. These tasks and projects would help in substantiating perspectives and theoretical framework studies in a teacher education classroom with field-based experiences. The task and projects may include collaborative partnership with the schools for developing CCE practices, establishing study circles/ forums for professional development of in-service school teachers, or dialoguing with the School Management Committee etc. Community-based engagement may also include oral history projects with a community of artisans as part of 'contemporary India Education' or 'Pedagogy of Social Science/ History'. Likewise, the pedagogy course on science may include environment-based projects to address concerns of a particular village/ city or a community.

Several specialized courses shall be offered to enhance professional capacities of a student-teacher such as course on Language and Communication, Drama and Art, self development and ICT. A course on critical understanding of ICT shall be offered as an important curricular resource, according primary role of the teacher, ensuring public ownership of digital recourses, and promoting constructivist approaches that privilege anticipation and co-creation over mere access to ICTs. Courses that would focus on developing the professional and personal self of a teacher will be designed to integrate theoretical and practical components, transacted through focused workshops with specific inputs on art, music and drama. These courses shall offers opportunities to study issues of identity, interpersonal relations, adult-child gaps, personal and social constructs, schools as sites for struggle and social change; understanding and practicing yoga education developing social sensitivity and the capacity to listen and emphasize.

***iii) School Internship***

School Internship would be a part of the board curricular area of "Engagement with the Field" and shall be designed to lead to development of a board repertoire of perspectives, professional capacities, teacher sensibilities and skills. The curriculum of B.Ed. shall provide for sustained engagement with learners and the school (including engaging in continuous and comprehensive assessment for learning), thereby creating a synergy with school in the

neighborhood throughout the year. Students-teacher shall be equipped to cater diverse needs of learners. These activities shall be organized for 4 weeks in the years of the course.

Students are to be actively engaged in teaching for 16 weeks in the final year of the course. They shell be engaged at two levels, namely upper primary (classes VI-VIII) and secondary (IX-X), or senior secondary(XI-XII) with at least 16 weeks in secondary / senior secondary classes. These should be provided opportunities to teach in schools with supervisory support and feedback from faculty.

Internship in schools will be for a minimum duration of 20 weeks for a two-year programme (4 weeks in the first year, and 16 weeks in the second year as noted above). This should also include, besides practice teaching, an initial phase of one week for observing a regular classroom with a regular teacher and would also include peer observations, teacher observation and faculty observations of practice lessons.

## Programme Implementation

The institution shall meet the following specific demands of implementing this professional programme of study:

(a) Prepare a calendar for all activities, including schools internship. The school internship and other school contact programme shell be synchronized with the academic calendar of the school.

(b) Make an arrangement with at least ten schools for the internship as well as other school-based activities of the programme. The arrangement shall have the approval of the district education authorities. These schools shall from contact point for all practicum activities and related work during the course of the programme.

(c) Transaction of the perspectives in Education and Curriculum and Pedagogic Studies courses should be done using a multiple and variety of approaches such as case studies, problem solving, and discussions on reflective journals and observation records, which would provide opportunities for reflective thinking.

(d) Initiate discourse on education by periodically organizing seminars, debates, lectures and discussion groups for students and faculty.

(e) Organize academic enrichment programme including interactions with faculty from parents' disciplines; and encourage faculty members to participate in academic pursuits and pursue research especially in schools. Provisions of leave shall be made for faculty to undertake research/ teaching in universities and schools.

(f) Schools teachers shall be invited to teacher education institutions for feedback to student-teachers and for extensions/ guest lectures and organizing colloquium.

(g) There shall be mechanisms and provision for addressing complaints of students and faculty, and for grievance redressal.

(h) For school internship, the TEIs and the participating schools shall set up a mutually agreed mechanism for mentoring, supervising, tracking and assessing the student teachers.

## Assessment

For Perspectives in Education and Curriculum and Pedagogies Studies, at least 20% to 30% marks may be assigned for continuous internal assessment and 70% to 80% marks for external examination. One-fourth of the total marks/ weightage shall be allocated to assessment of practices teaching. The weightage for internal and external assessment shall be prescribed by the affiliating university. Candidates must be internally assessed on the entire course of Engagement with the Field and not only on the project/field work given to them as part of their units of study. The basis for assignment and criteria used ought to be transparent for students to benefit maximally out of professional feedback. Students shall be given information about their grades/marks as part of professional feedback so that they get the opportunity to improve their performance. The bases of internal assessment may include individual of group assignments, observation records, student portfolio, diaries, journal etc.

Total No. of Credits in Four Semesters = 98 (90 + 8) (B.Ed. Course +Course offered by other Department)

## B.Ed. Semester-I

| Sl. No. | Course Code | Total Credits | Paper Title | Total Marks (Theory + Practicum) | Credits (Theory) | Class Teaching Hours per week | Credits: Practicum (Engagement with the Field) | Practicum Hours per week (per semester) | Total Hours per week (per semester) | Internal Assessment Weightage | External Assessment Weightage |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | SOE020101C3014 | 4 | Childhood and Growing Up | 100 | 3 | 3 | 1 | 2 | 5 | 30% | 70% |
| 2 | SOE020102C3014 | 4 | Contemporary India and Education | 100 | 3 | 3 | 1 | 2 | 5 | 30% | 70% |
| 3 | SOE020103C3014 | 4 | Assessment for learning | 100 | 3 | 3 | 1 | 2 | 5 | 30% | 70% |
| 4 | SOE020104C3014 | 4 | Value and Peace Education | 100 | 3 | 3 | 1 | 2 | 5 | 30% | 70% |
| 5 | SOE020105C1012 | 2 | Language Across the Curriculum | 50 | 1 | 1 | 1 | 2 | 3 | 30% | 70% |
| 6 | SOE020106C1012 | 2 | Understanding Discipline and Subjects | 50 | 1 | 1 | 1 | 2 | 3 | 30% | 70% |
| 7 | SOE020107C1012 | 2 | Reading and Reflection on Text | 50 | 1 | 1 | 1 | 2 | 3 | 30% | 70% |
| 8 | | 4 | To be taken from other Department | 100 | 4 | 4 | 0 | 0 | 4 | 30% | 70% |
| | Total | 26 | | 650 | 19 | 19 | 7 | 14 | 33 | | |

**Practicum/Hands on/ Students Activity /Seminar/Workshop/etc; during Practicum hours**

- **1 Credit Theory = 16 hours in a semester**
- **1 Credit Practicum =32 hours in a semester**
- **1 Credit = 25 Marks**
- **Course Code offered to other Department in Semester I is presented in Table-4**

## B.Ed. Semester-II

| Sl. No. | Course Code | Total Credits | Paper Title | Total Marks (Theory + Practicum) | Credits (Theory) | Class Teaching Hours per week | Credits: Practicum (Engagement with the Field) | Practicum Hours per week (per semester) | Total Hours per week (per semester) | Internal Assessment Weightage | External Assessment Weightage |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 8 | SOE020208C3014 | 4 | Learning and Teaching | 100 | 3 | 3 | 1 | 2 | 5 | 30% | 70% |
| 9 | SOE020209C3014 | 4 | Knowledge and Curriculum | 100 | 3 | 3 | 1 | 2 | 5 | 30% | 70% |
| 10 | SOE020210C3014 -- SOE020226C3014 | 4 | Pedagogy of School Subject-1* (Part-I) | 100 | 3 | 3 | 1 | 2 | 5 | 30% | 70% |
| 11 | SOE020210C3014 -- SOE020226C3014 | 4 | Pedagogy of School Subject-2* (Part-I) | 100 | 3 | 3 | 1 | 2 | 5 | 30% | 70% |
| 12 | SOE020227C2024 | 4 | Drama and Art in Education | 100 | 2 | 2 | 2 | 4 | 6 | 30% | 70% |
| 13 | SOE020228C0044 | 4 | School Internship** | 100 | 0 | 0 | 4 | 8 | 8 | 50% | 50%* |
| | **Total** | **24** | | **600** | **14** | **14** | **10** | **20** | **34** | | |

**Practicum/Hands on/ Students Activity /Seminar/Workshop/etc; during Practicum hours**

- **1Credit Theory = 16 hours in a semester**
- **1 Credit Practicum = 32 hours in a semester**
- **1 Credit = 25 Marks**
- ***Pedagogy of School Subject-1* & Subject-2* (Part-I) may choose from List given below in Table-1.**
- ****Students will be engaged with school for the four weeks during the Semester.**

## B.Ed. Semester-III

| Sl.No. | Course Code | Total Credits | Paper Title | Total Marks (Theory + Practicum) | Credits (Theory) | Class Teaching Hours per week | Credits: Practicum (Engagement with the Field) | Practicum Hours per week (per semester) | Total Hours per week (per semester) | Internal Assessment Weightage | External Assessment Weightage |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 14 | SOE020329C1012 -- SOE020345C1012 | 2 | Pedagogy of School Subject-1* (Part-II) | 50 | 1 | 1 | 1 | 2 | 3 | 30% | 70% |
| 15 | SOE020329C1012 -- SOE020345C1012 | 2 | Pedagogy of School Subject-2* (Part-II) | 50 | 1 | 1 | 1 | 2 | 3 | 30% | 70% |
| 16 | SOE020346C001616 | 16 | **School Internship*** | 400 | 0 | 0 | 16 | 32 | 32 | 60% | 40% |
| 17 | | 4 | ***To be taken from other Department** | 100 | 4 | 4 | 0 | 0 | 4 | 30% | 70% |
| | **Total** | **24** | | **600** | **6** | **6** | **18** | **36** | **42** | | |

**Practicum includes lesson planning/ Engagement with the field/ Hands-on experience/activities/seminars/workshops etc.**

courses for advanced level pedagogy ( senior secondary level) can be offered to post graduates in a school subject.

@ internship + school and community-based activities ( credits 14+2) = Marks 350+50=400

**Note: During School Internship School and Community-Based Activities may be arranged in terms of resources available in the teacher education institutions/university.**

***School Internship will be treated as Practicum Course.**

**1Credit Theory = 16 hours in a semester**

**1 Credit Practicum = 32 hours in a semester**

**1 Credit = 25 Marks**

***Pedagogy of School Subject-1* & Subject-2* (Part-I) maychoose from List given below in table-2.**

*** Students will be engaged with school for 16 weeksduring the Semester.**

*Courses offered by the other Department: maximum -4 Credits

## B.Ed. Semester-IV

| Sl.No. | Course Code | Total Credits | Paper Title | Total Marks (Theory + Practicum) | Credits (Theory) | Class Teaching Hours per week | Credits: Practicum (Engagement with the Field) | Practicum Hours per week (per semester) | Total Hours per week (per semester) | Internal Assessment Weightage | External Assessment Weightage |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 18 | SOE020447C3014 | 4 | Gender, School and Society | 100 | 3 | 3 | 1 | 2 | 5 | 30% | 70% |
| 19 | SOE020448C3014 | 4 | Transaction of Curriculum: Issues & Challenges | 100 | 3 | 3 | 1 | 2 | 5 | 30% | 70% |
| 20 | SOE020449C3014 | 4 | Creating an Inclusive School | 100 | 3 | 3 | 1 | 2 | 5 | 30% | 70% |
| 21 | SOE020450C0022 | 2 | Critical Understanding of ICT | 50 | 0 | 0 | 2 | 4 | 4 | 30% | 70% |
| 22 | SOE020451C1012 | 2 | Understanding the Self | 50 | 0 | 0 | 2 | 4 | 4 | 30% | 70% |
| 23 | SOE020452C1012 | 2 | Environmental Education | 50 | 1 | 1 | 1 | 2 | 3 | 30% | 70% |
| 24 | SOE020453C1012 | 2 | Yoga Education | 50 | 0 | 0 | 2 | 4 | 4 | 30% | 70% |
| 25 | SOE020454DCEC1012-SOE020459DCEC1012 | 2 | Optional Course*-1 | 50 | 1 | 1 | 1 | 2 | 3 | 30% | 70% |
| 26 | SOE020454DCEC1012-SOE020459DCEC1012 | 2 | Optional Course*-2 | 50 | 1 | 1 | 1 | 2 | 3 | 30% | 70% |
| | **Total** | **24** | | **600** | **12** | **12** | **12** | **24** | **36** | | |

**Practicum/Hands on/ Students Activity /Seminar/Workshop/etc; during Practicum hours**

- **1Credit Theory = 16 hours in a semester ,1 Credit Practicum = 32 hours in a semester**
- **1 Credit = 25 Marks*Optional Course may choose from Table-3.**

Table-1: List of Pedagogical Courses* offered by the School of Education in I[st] Year (Semester II)

| Sl. No. | Course Code | Course Title (Group-I) | Sl. No. | Course Code | Course Title (Group-II) |
|---|---|---|---|---|---|
| 1 | SOE020210C3014 | Pedagogy of Hindi | 1 | SOE020216C3014 | Pedagogy of Hindi |
| 2 | SOE020211C3014 | Pedagogy of English | 2 | SOE020217C3014 | Pedagogy of English |
| 3 | SOE020212C3014 | Pedagogy of Social Sciences | 3 | SOE020218C3014 | Pedagogy of History |
| 4 | SOE020213C3014 | Pedagogy of Mathematics | 4 | SOE020219C3014 | Pedagogy of Geography |
| 5 | SOE020214C3014 | Pedagogy of Life Science | 5 | SOE020220C3014 | Pedagogy of Political Sciences |
| 6 | SOE020215C3014 | Pedagogy of Physical Science | 6 | SOE020221C3014 | Pedagogy of Economics |
| | | | 7 | SOE020222C3014 | Pedagogy of Physics |
| | | | 8 | SOE020223C3014 | Pedagogy of Chemistry |
| | | | 9 | SOE020224C3014 | Pedagogy of Mathematics |
| | | | 10 | SOE020225C3014 | Pedagogy of Biological Sciences |
| | | | 11 | SOE020226C3014 | Pedagogy of Commerce |

Note: Teaching subjects are likely to be added in due course. Group I is for Graduate Students. & Group II is for Post Graduate Students

Table-2: List of Pedagogical Courses offered by the School of Education in II Year (Semester III)

| Sl. No. | Course Code | Course Title (Group-I) | Sl. No. | Course Code | Course Title (Group-II) |
|---|---|---|---|---|---|
| 1 | SOE020329C1012 | Pedagogy of Hindi | 1 | SOE020335C1012 | Pedagogy of Hindi |
| 2 | SOE020330C1012 | Pedagogy of English | 2 | SOE020336C1012 | Pedagogy of English |
| 3 | SOE020331C1012 | Pedagogy of Social Sciences | 3 | SOE020337C1012 | Pedagogy of History |
| 4 | SOE020332C1012 | Pedagogy of Mathematics | 4 | SOE020338C1012 | Pedagogy of Geography |
| 5 | SOE020333C1012 | Pedagogy of Life Science | 5 | SOE020339C1012 | Pedagogy of Political Sciences |
| 6 | SOE020334C1012 | Pedagogy of Physical Science | 6 | SOE020340C1012 | Pedagogy of Economics |
| | | | 7 | SOE020341C1012 | Pedagogy of Physics |
| | | | 8 | SOE020342C1012 | Pedagogy of Chemistry |
| | | | 9 | SOE020343C1012 | Pedagogy of Mathematics |
| | | | 10 | SOE020344C1012 | Pedagogy of Biological Sciences |
| | | | 11 | SOE020345C1012 | Pedagogy of Commerce |

**Note:** Teaching subjects are likely to be added in due course. Group I is for Graduate and Group II is for Post Graduate Students

**Table-3: List of Optional Courses offered by the School of Education in 2nd Year (Semester IV)**
**Choose any two from the following List**

| Sl. No. | Course Code | Course Title |
|---|---|---|
| 1 | SOE020454DCEC1012 | Educational Administration and Management |
| 2 | SOE020455DCEC1012 | Life Skills in Education |
| 3 | SOE020456DCEC1012 | Guidance and Counselling |
| 4 | SOE020457DCEC1012 | Health &Physical Education |
| 5 | SOE020458DCEC1012 | Education in Indian Constitution |
| 6 | SOE020459DCEC1012 | Comparative Education |

**Table-4: List of Courses offered by the School of Education to other Departments in Semester-I**

| Sl. No. | Course Code | Course Title |
|---|---|---|
| 1 | SOE020157GEC3014 | Value Based Education |
| 2 | SOE020158GEC3014 | Art in Education |

# SEMESTER IV

## GENDER, SCHOOL AND SOCIETY
## COURSE CODE - SOE020447C3014

**Year II**
**Semester IV**

**Credit : 4**
**Max Marks : 100**

**Essence of the Course:**

Gender sensitivity is the dire need of the present society. This course is one of the stepping stone towards it as it has been designed with the vision of making prospective teachers not only familiarize with the gender related terms, concepts and issues, but also to capacitate them with the knowledge of initiatives on the part of family, caste, religion, state, school, society, mass media and government. It will make the student teachers realize their importance and potential in making this world free from the gender based stigma.

**Objectives :** Present course aims at developing among pupil teachers:

- basic understanding and familiarity with key concepts-gender, sex, transgender, gender bias, gender stereotype, empowerment, gender parity, equity and equality, patriarchy and matriarchy and feminism
- positivity about policies, plans and schemes of the government for addressing all forms of disparities and inequalities existing in the society
- sensitivity about gender issues in school, curriculum, and textual materials
- acquaintance with teaching strategies for creating gender parity and its intersection with class, caste, religion and region; and understand the need to address gender based violence in all social spaces
- familiarization with the outstanding personality who mark the women empowerment
- awareness about the role of mass media in bringing gender parity in society

| Teaching Scheme (session)* | | | Total (L+T+P) | Examination Scheme | | |
|---|---|---|---|---|---|---|
| | | | | Internal Assessment | External Assessment | Total Marks |
| **Unit** | **L** | **T/P** | **C** | | | |
| I | 12 | 4 | 16 | 30 Marks | 70 Marks | 100 Marks |
| II | 12 | 4 | 16 | | | |
| III | 12 | 4 | 16 | | | |
| IV | 12 | 4 | 16 | | | |
| **Total** | **48** | **16** | **64** | 30 Marks | 70 Marks | 100 Marks |
| **L = Lecture, T= Tutorial, P=Practicum** | | | | | | |

**Course Content / Syllabus**

**Unit -1 : Introduction to Gender, Gender Roles, Gender Identity and Socialization Process**

- Gender: concept, meaning, definition, difference between gender and sex
- Gender related concepts: sexuality, feminism, equity and equality
- Gender related roles through variety of institutions: family, caste and religion
- Emergence of gender specific roles through sociological and psychological perspective: Conflict Theory by Karl Marx and Feminist Sociological Theory by Celia Winkler

**Unit 2 : Gender and School**

- Gender bias in school enrolments, dropouts, household responsibilities and societal attitudes towards girl's education.
- Gender issues in schools: curriculum, hidden curriculum, sexual abuse and sexual harassment.
- Gender parity development by the means of curriculum texthooks and teacher.
- Teaching ways to develop gender sensitivity

**Unit 3 : Gender and society**

- Concept of patriarchy and matriarchy related to Indian women.
- Issues related to women/ girl child: female infanticide and foeticide, sex ratio, honour killing, dowry, property rights and divorce.
- Contemporary women role models in India: Tessy Thomas (DRDO), Arundhati Bhattacharya (RBI Governor) and Chavi Rajawat (Women Sarpanch)

**Unit 4 : Role of Media and Government in Gender Parity**

- Role of media to ensure no: stereotypes, vulgarity in songs and films, print and electronic media
- Role of media in bringing respect for men and women.
- Provisions for developing gender parity:
  - Equal Remuneration Act(1976)
  - Domestic Violence Act(2005)
  - Reservation for Women (2008)
  - Supreme Court Verdict about Transgender(2018)

**Transactional Strategies :**

Lecture cum discussion, Tutorials, Brainstorming Session, Use of PPT, Film Shows (selected films), Assignments on different key areas of gender related issues given in syllabus through Google Group, Google Classroom and other online resources.

**Internal Assessment Strategies :**

A total of thirty marks have been allotted under Internal Assessment. The nature of the activity, mode and weightage of marks are as follows.

| S. No. | Activity | Mode | Weightage of Marks |
|---|---|---|---|
| 1 | Two Sessional tests will be conducted (Better one will be considered) | Test | 10 |
| 2 | Preparation of an assignment on various topics and it is followed by presentation in the classroom (Group activity) & Practicum | Assignment & Presentation (PPT) | 05+10 |
| 3 | Percentage of attendance | | 05 |
| | **Total Marks** | | 30 |

**Practicum :**

- Organising debates on equality cutting across gender, class, cast and religion.
- Case study on how students perceive role models in their own lives
- Debate on women role models in various fields with emphasis on women in unconventional roles.
- Prepare an analytical report on portrayal of women in print and electronic media.

**Suggested Readings :**


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- Nair, S (2015). *More gender inequality in India than Pakistan and Bangladesh*: UN.Indian Express December 15.
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- Sen. K. and Kumar. S.(2001). *Women in India How free; How equal*. Report Commissioned by the Office of the United Nations Resident Coordinator in India. UNDP.
- Tavares. Rebecca R and Mishra. Y. (2016) *Budget 2016 To really transform India, focus on women first*. The Times of India. March 1.
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- United Nations. (1995). *Fourth world conference on women*. United Nations Entity for Gender Equality and Empowerment of Women, Beijing, China.
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- World Bank. (2012). *HIV/AIDS in India*. Available: http://www.worldbank.org/en/news/feature/2012/07/10/hivaids-india [Accessed 2014, December 28]


**Web Resources :**


https://www.amazon.in/Gender-School-Society-TEXT-TEACHERS-ebook/dp/B073Q8L39R
http://www.bdu.ac.in/cde/docs/ebooks/B-Ed/II/GENDER,%20SCHOOL,%20SOCIETY%20AND%20INCLUSIVE%20SCHOOL.pdf
http://www.ncert.nic.in/departments/nie/dse/activities/advisory_board/PDF/Genderconcerns.pdf
http://oxfordre.com/education/view/10.1093/acrefore/9780190264093.001.0001/acrefore-9780190264093-e-73
https://www.brookings.edu/blog/education-plus-development/2017/11/02/how-can-teachers-be-more-gender-inclusive-in-the-classroom/
https://www.ithaca.edu/wise/gender/
http://unesdoc.unesco.org/images/0017/001781/178125e.pdf
https://onlinelibrary.wiley.com/doi/abs/10.1002/tea.10044
https://www.sciencedirect.com/science/article/pii/S0360131508000201
https://www.cambridge.org/core/journals/language-teaching/article/issues-of-language-and-gender-in-second-and-foreign-language-education/9112FA5B296E2DD34DF71A3C3958A912
https://www.sciencedirect.com/science/article/pii/S0360131504000533
https://books.google.co.in/books?hl=en&lr=&id=DoZuDwAAQBAJ&oi=fnd&pg=PR3&dq=gender+issues+in+education+and+its+impact+on+society&ots=S3Bm0gVJ0m&sig=kvkJnvoFT1HewCgzWDX-Xkp-O2w#v=onepage&q=gender%20issues%20in%20education%20and%20its%20impact%20on%20society&f=false
https://www.nytimes.com/spotlight/gender-and-society
https://www.ithaca.edu/wise/gender/
https://timesofindia.indiatimes.com/topic/gender-discrimination
https://www.washingtonpost.com/news/worldviews/wp/2018/03/12/why-indias-modern-women-say-its-a-burden-to-be-female/
http://theconversation.com/achieving-gender-equality-in-india-what-works-and-what-doesnt-67189
https://indianexpress.com/article/opinion/columns/indian-women-safety-economy-beti-bachao-gender-equality-5329742/

## TRANSACTION OF CURRICULUM-ISSUES & CHALLENGES

## COURSE CODE – SOE020448C3014

**Year II** **Credit 4**

**Semester IV** **Max Marks 100**

**Essence of the Course:**

Every teacher has to deal with creation of congenial environment for curriculum transaction. Teachers' job is primarily concerned with operationalizing the various curricular practices. Teachers' understanding about the nature of knowledge in the context of school subjects is essentially desirable. It aims at providing knowledge and skills to student-teachers relating to curriculum development, it's process, implementation and evaluation. Different concepts like types, models, approaches of curriculum development and modes of curriculum transaction have also been incorporated in this course for further enhancement of their understanding.

**Objectives :**

The student teachers will be able to:

- describe the concept of curriculum development, source of curriculum development and curriculum organizations
- familiar with the types and models of curriculum
- interpret the meaning of the recommendations of NCF 2005 and NCFTE 2009 pertaining to curriculum
- appraise the need, importance, sources and types of curriculum evaluation
- critically analyse the subject matter and content

| Teaching Scheme (session)* | | | Total (L+T+P) | Examination Scheme | | |
|---|---|---|---|---|---|---|
| | | | | Internal Assessment | External Assessment | Total Marks |
| **Unit** | **L** | **T/P** | **C** | | | |
| I | 12 | 4 | 16 | 30 Marks | 70 Marks | 100 Marks |
| II | 12 | 4 | 16 | | | |
| III | 12 | 4 | 16 | | | |
| IV | 12 | 4 | 16 | | | |
| **Total** | **48** | **16** | **64** | **30 Marks** | **70 Marks** | **100 Marks** |
| **L= Lecture, T=Tutorial, P=Practicum** | | | | | | |

Course Content / Syllabus

**Unit -1 : Curriculum Development**

- Curriculum Development : Concept and Sources
- Curriculum organization: Horizontal & Vertical
- Curriculum Development Considerations
- Selection of Content & Learning Experiences

**Unit 2 : Curriculum Framework & Implementation**

- NCF 2005 and NCFTE 2009: Recommendations on Curriculum
- Concept and Nature of Curriculum Implementation
- Curriculum Implementation Models : ORC Model, Organizational Development Model
- Approaches of Curriculum Implementation : Academic, Behavioural & System approach

**Unit 3 : Curriculum Model & Transaction**

- Models of Curriculum Development - Tylor's Model, Hilda Taba's Model, Alexandar's Model
- Curriculum Transaction: Modes of transaction
- Role of different agents in curriculum transaction : Principal & Teachers
- Role of curriculum in effective teaching learning process

**Unit 4 : Curriculum Evaluation**

- Curriculum Evaluation: Concept, Need and Importance
- Sources of Curriculum Evaluation
- Types of Curriculum Evaluation
- Subject Matter Analysis

**Transactional Strategies :**

Lecture cum discussion, Assignments on various topics, PPT presentation and discussion, Preparation of activity based curriculum in groups and discussion, Analysis of curriculums at various levels, Group discussion bases, process and approaches of curriculum development, chart preparation on various models and process, panel discussion on various issues of curriculum development and reviewing B.Ed. curriculum

**Internal Assessment Strategies:**

A total of thirty marks have allotted under Internal Assessment. The nature of the activity, mode and weightage of marks are as follows

| S. No. | Activity | Mode | Weightage of Marks |
|---|---|---|---|
| 1 | Two Sessional tests will be conducted (Better one will be considered) | Test | 10 |
| 2 | Practicum and Preparation of an assignment on various topics and it is followed by presentation in the classroom (Group activity) | Assignment & Presentation (PPT) | 05+10 |
| 3 | Percentage of attendance | | 05 |
| **Total Marks** | | | **30** |

**Practicum :**

- Preparation of unit plan of concerned Pedagogy Subjects
- Reflection on NCF 2005 or NCTEP 2009
- Content Analysis
- Book Review of a Textbook

**Suggested Readings :**


- Aggrawal, J.C., & Gupta, S. (2005). *Curriculum development*. New Delhi: Shipra Publisher.
- Ainsworth, L. (2014). Rigorous curriculum design: How to create curricular units of study that align standards, instruction, and assessment. Houghton Mifflin Harcourt Publishers.
- Alexander, W.M., & Saylor, J.G. (1966). *Curriculum planning for modern schools*. New York: Holt, Rinhart and Winston Inc.
- Balrara, M. (1999). *Principles of curriculum renewal*. New Delhi: Kanishka Publishers.
- Bhatia, S.K., & Jindal, S. (2016). *A textbook of curriculum, pedagogy and evaluation* (1st Edition). Paragon Publishers.
- Candra, A. (1977). *Curriculum development and evaluation in education*. New Delhi: Sterling Publishers.
- Jenkins, D., & Shiffman, D.M. (1976). *Curriculum: An introduction*. London: Pitman Publishing House.
- Khan, M.I., & Nigam, B.K. (2007). *Curriculum reform change and continuity*. New Delhi: Kanishka Publication.
- Madan, P. (2017). Curriculum development and assessment (1st Edition) (Hindi). Agarwal Publisher

- Musgrave, P.W. (1974). *Contemporary studies in the curriculum*. Australia: Angus and Roberston Publishers.
- *National Curriculum Framework* (2005): New Delhi: NCERT.
- Nigam, B.K., & Khan, M.I. (1993) *Evaluation and research in curriculum construction*. New Delhi: Kanishka Publishers.
- Ornstein A. C., & Hankins, F. P. (2009). *Curriculum foundations, principles and issues* (5th edition). Boston, MA: Allyn and Bacon
- Ornstein, A.C., & Hunkins, F. (1988). *Curriculum foundations, principles and issues*. New Jersey: Prentice Hall.
- Panday, M. (2007). *Principles of curriculum development*. New Delhi, Rajat Publications.
- Sharma, R. (2002). *Modern methods of curriculum organisation*. Jaipur Book Enclave.
- Sharma, S.R. (1999). *Issues in curriculum administration*. New Delhi: Pearl Publishing House.
- Srivastava, H.S. (2006). *Curriculum and methods of teaching*. New Delhi: Shipra Publishers.
- Taylor, P. (2003): *How to design a training course. A guide to participatory curriculum development*. London: Continuum.
- Walker, D. F. (1990). *Fundamentals of curriculum* Fort Worth, TX. Harcourt Brace College.
- Yadav, S.K. (2013). *School curriculum. Structure and practice*. New Delhi, NCERT.
- Yadav, Y.P. (2006). *Fundamentals of curriculum design* New Delhi. Shri Sai Printographers.


**Web Sources**


- NCF-2005 available on www.ncert.ac in
- NCTTE: http://www.ncte-india.org/publicnotice/NCTTE_2010.pdf
- National Curriculum Framework for Teacher Education, 2009. Available online at www.teindia.nic.in/files/national_curriculu-for-teacher-education-2009.pdf

# CREATING AN INCLUSIVE SCHOOL

## COURSE CODE – SOE020449C3014

**Credit 4**

**Max Marks 100**

**Year II**

**Semester IV**

**Essence of the Course:**

This is a core course carrying 4 credits. It covers concept of special education, mainstreaming and inclusion, national policies, programmes and acts for inclusive education, nature and needs of the individuals having disabilities, inclusion in operation, and characteristics of inclusive school. The objective of this course is to bring about an understanding of the 'cultures, policies and practices' that need to be addressed in order to create an inclusive school. It will help student-teachers in identification of barriers to learning and participation while formulating a policy of good practice and review. The objective of the course is to integrate the children with disabilities with the general community as equal partners, to prepare them for normal growth and to enable them to face life with courage and confidence.

**Objectives :** The student teachers will be able to:

- interpret the concept, significance and philosophy of inclusive education in the context of Education for All.
- identify and address the diverse needs of learners.
- compare and contrast the National & International Policies & Programmes with respect to the children with special needs
- explain the concept of Mainstreaming, Special Education and Inclusion
- examine the status of Inclusive Education in India critically.
- define the role of different specialists in the area of special education.
- comprehend and apply the special techniques of teaching and evaluating the children with special needs.
- suggest and device the various inclusive practices to promote inclusion in the classroom.

| Teaching Scheme (session)* | | | Total (L+T+P) | Examination Scheme | | |
|---|---|---|---|---|---|---|
| | | | | Internal Assessment | External Assessment | Total Marks |
| Unit | L | T/P | C | | | |
| I | 12 | 4 | 16 | 30 Marks | 70 Marks | 100 Marks |
| II | 12 | 4 | 16 | | | |
| III | 12 | 4 | 16 | | | |
| IV | 12 | 4 | 16 | | | |
| **Total** | **48** | **16** | **64** | **30 Marks** | **70 Marks** | **100 Marks** |

L= Lecture, T=Tutorial, P=Practicum

**Course Content / Syllabus**

**Unit -1 : Exceptionality & Exceptional Children**

- Concept of Exceptionality, Positive, Negative & Multiple Deviation
- Concept of Disability, Impairment and Handicapped
- Continuum of Special Education Services
- Special Need Children – Types, Characteristics and Educational Programme

**Unit 2 : Conceptual understanding of Inclusive Education**

- Inclusive education: Concept, Meaning and Characteristics
- Bases of Inclusive education
  - Philosophical
  - Social
- Difference between Special Education, Integrated Education and Inclusive Education.
- Benefits of inclusive education for Children with and without special needs

**Unit 3 : Policies and Programmes for Inclusive Education**

- International Policies & Programmes
  - Salamanca Statement (1994)
  - UN Convention on Rights of the Person with Disability, UNESCO-2006
  - Policies guidelines on Inclusive Education, UNESCO- 2009
- National Policies & Programmes
  - RCI Act 1992
  - PwD Act (1995)
  - National Policy on Disability (2005)
  - The Right of Persons with Disabilities Act, 2016.

**Unit 4 : Preparing Schools for Inclusion**

- School readiness for addressing the diverse needs of children with special needs :
  - Infrastructural
  - Technological

- Pedagogical
- Attitudinal needs

- Strengthening support services - collaboration of different specialists :
  - Special Education Teacher
  - Speech Therapist
  - Physiotherapist
  - Counsellor

**Transactional Strategies :**

Lecture-cum-Discussion, Group discussion on various policies and programmes, Power point presentation, Film shows, Sharing of experiences of people regarding issues of disabilities, Preparation of projects on various issues related to special education and exclusion.

**Internal Assessment Strategies:** A total of thirty marks have been allotted under Internal Assessment. The nature of the activity, mode and weightage of marks are as follows.

| S. No. | Activity | Mode | Weightage of Marks |
|---|---|---|---|
| 1 | Two Sessional tests will be conducted (Better one will be considered) | Test | 10 |
| 2 | Practicum & Preparation of an assignment on various topics and it is followed by presentation in the classroom (Group activity) | Case Study & Presentation (PPT) | 05+ 10 |
| 3 | Percentage of attendance | | 05 |
| | | **Total Marks** | **30** |

**Practicum :**

- Collection of data regarding children with special needs from school record.
- Visit to Inclusive Schools and to observe classroom transaction and prepare a report of the same.
- Case study of one mainstreamed (Inclusive) student with respect to :
  1. Role of a parent
  2. Role of a teacher, special school teacher
  3. Role of counselor



4533

**Suggested Readings :**


- Alur, M., & Timmons, V. (2009). *Inclusive education across cultures: Crossing boundaries, sharing ideo* New Delhi: Sage Publications India Pvt. Ltd.
- Finian, M.J., Fafard, M., & Howell, K.W. (1984). *A teacher's guide to human resources in special education. Para professionals, volunteers, and peer tutors.* Boston: Allyn and Bacon Inc.
- Hallahan, D.P., & Kauffman, J.K. (1988). *Exceptional children: Introduction to special Education.* N.J.: Englewood Cliffs.
- Jangira, N.K. (1986). *Special education scenario in Britain and India.* Gurgaon: The Academic Press.
- Julka, A., & Bharti, (2014). *Teachers creating inclusive classrooms. Issues and challenges. A research study.* New Delhi: Department of Education of Groups with Special Needs, National Council of Educational Research and Training.
- Kapoor, S. (2015). *Index of inclusive school quality.* Delhi: Brotherhood Publisher.
- Frederickson, N., & Cline, T. (2009). *Special educational needs, inclusion and diversity* (2nd edition). New York: McGraw Hill Education Open University Press.
- Gargiulo, R M. (2015). *Special education in contemporary society: An introduction to exceptionality.* Canada: Sage Publications.
- Hallahan, D.P., Kauffman, J M., & Pullen, P.C. (2018). *Exceptional learners. An introduction to special education.* (14th edition) New Jersey: Pearson Education.
- Kothari, R.G., & Mistry, H.S. (2011). *Problems of students and teachers of the special schools – A study of Gujarat state.* Germany. VDM Publication.
- Messily, K. (2012). *Confronting marginalisation in education: A framework for promoting inclusion.* London: Rutledge Publication.
- Mithu, A., & Michael, B. (2005). *Inclusive education. From rhetoric to reality* New Delhi: Viva Books Pvt. Ltd.
- NCERT (2006). *Position paper: National focus group on education of children with special needs.* New Delhi: NCERT.
- Oza, D., & Pandit, R. (2011) *Management of behavioural problems of children with mental retardation.* Germany: VDM Publication.
- Premavathy, V., & Geetha, I. (2006). *Integrated and inclusive education DSE (VI) Manual* New Delhi: Krishana Publication.
- Reed, M. (1984). *Educating hearing impaired children* Milton Keynes: Open University Press
- Sharma, P L. (1988) *A teacher's handbook on integrated education of the disabled* New Delhi: NCERT.
- Ysseldyke, J.E. (2016) *Special education: A practical approach for teachers* (1st Edition). Kanishka Publishers.

**Web Resources**


- Consortium for Research on Educational Access, Transitions and Equity.Retrieved from http://www.create-rpe.org/pdf documents/PTA15.pdf
- IBE-UNESCO (2016). Training Tools for Curriculum Development - Reaching Out To All Learners: a resource pack for supporting Inclusive Education. Ibe.training@unesco.org. http://www.ibe.unesco
- The SALAMANCA statement and framework for action on special needs education. Available online www.unesco.org/education/pdfSALAMA_EPDF
- IBE-UNESCO (2016). Training Tools for Curriculum Development - Reaching Out To All Learners: a resource pack for supporting Inclusive Education, Ibe.training@unesco.org. http://www.ibe.unesco
- Video on A World for Inclusion (2007) by UNESCO, directed by David Atrakchi. 20 minutes,http://www.unesco.org/archives/multimedia/index.php?s=films_details&pg=33&id=213
- Children with Disabilities (2012), by UNESCO. 23 minutes, http://www.unesco.org/archives/multimedia/index.php?s=films_details&pg=33&id=2758
- https://www.teachervision.com/teaching-strategies/special-needs
- https://www.researchgate.net/publication/282774571_Preparing_Teachers_for_Inclusive_Education_in_Botswana_The_Role_of_Professional_Development
- http://www.rehabcouncil.nic.in/writereaddata/Block2accie.pdf

## CRITICAL UNDERSTANDING OF ICT
## COURSE CODE - SOE020450C0022

**Year: II** **Credit: 2**
**Semester: IV** **Max Marks: 50**

**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 process. 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. An important aspect of this course is to give a sense of responsibility that comes with the technological advancements. Using technology in a classroom is an important skill for learning teachers towards ICT enabled education. This course focuses on equipping the student teachers with skills of basic computer literacy and ICT-aided learning; and applications of ICT in administrative and academic support systems.

**Objectives:**

The student teachers will be able to:

- familiarize with computer system.
- work on Word processing, Spread sheets and Presentation software.
- operate on Internet with safety.
- 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.
- access on line course materials – MOOC and other platforms.
- develop conceptual understanding of Information & Communication Technology
- identify and discuss the policy concerns regarding ICT in Education

| Teaching Scheme (session)* | | | | Total (L+T+P) | Examination Scheme | | |
|---|---|---|---|---|---|---|---|
| | | | | | Internal Assessment | External Assessment | Total Marks |
| Unit | L | T | P | C | | | |
| I | 6 | 2 | 22 | 30 | 15 Marks | 35 Marks | 50 Marks |
| II | 8 | 2 | 20 | 30 | | | |
| **Total** | 14 | 4 | 42 | 60 | 15 Marks | 35 Marks | 50 Marks |
| **L= Lecture, T= Tutorial, P=Practical** | | | | | | | |

**Course Content / Syllabus**

**Unit -1 : Fundamentals of Computer**

- Introduction of Computer, Components of Computer
- Hardware: Input and Output Devices, Central Processing Unit, Memory and Storage
- Software: Meaning and Types, Features of Application Software, Operating System and its functions, MS Windows, Linux, iOS
- MS WORD: Introduction to a Word Processor, Basic components of MS WORD and its operation
- MS Excel: Introduction to Spreadsheets, Concept of Worksheets and their operations, Spreadsheet operations-entering Numbers ,text, Dates & Time, formulae, Preparation of Worksheets
- MS Power Point:, Basic components of MS Power Point and its operation, creation of Power point Presentation Preparation of different types of slides, slide design, colour and background, slide transition, custom animation

**Unit 2: Conceptual Understanding of Information and Communication Technology and Internet**

- Information and communication technology: Meaning, Concept and Challenges of Integration of ICT in School
- Aims and Objectives of National Policy on Information and Communication Technology (ICT) in School Education in India and National Mission on Education through ICT (NMEICT),
- Internet: Ways of using the Internet in teaching learning process, E-mail, Google Drive, Google Group, Search Engines, Safe surfing mode
- E- educational Resources & Platforms : MOOC's , SWAYAM, Gyan Darshan, Gyan Vani, Sakshat Portal, e-Gyan Kosh, Wikipedia, Face Book, You Tube, Google Scholar

**Transactional Strategies :**

**Unit I**

i) Hands on experience in ICT Lab
ii) Demonstration on various application of MS Office
iii) Development of teaching learning resources using MS Office.
iv) Internet Surfing/Web browsing in ICT Lab

**Unit II**

i) Discussion on various ICT related issues
ii) Lecture cum Demonstration method will be used,

iii) Interaction with ICT software and hardware specialist
iv) Power point presentation on various topics

**Practicum:** Choose any two of the following and Make a soft file and submit in CD form for evaluation:

- Making of a resume in MS Word.
- Making of a Lesson Plan in MS Word.
- Making of presentation in MS Power Point of any topic from B.Ed. Curriculum or school subject.
- Making of progress report-card and annual results in MS Excel.
- Graphical representation of data.
- Making of projects using internet.
- Making of projects integrating internet and smart classroom.
- Any other project/assignment given by the institution.

**NOTE: External practical will be conducted by external examiner at the end of the semester.**

**Internal Assessment Strategies:** A total of 15 marks have been allotted under Internal Assessment. The nature of the activity, mode and Weightage of marks are as follows.

| S. No | Activity | Mode | Weightage of Marks |
|---|---|---|---|
| 1 | Two Presentation from suggestive list (Better one out of Two will be considered) + Viva- Voce | Power Point Presentation | 5+5 |
| 2 | Preparation of a Practical File on various topics | Assignment | 2.5 |
| 3 | Percentage of attendance | - | 2.5 |
| | | **Total Marks** | **15** |

**Suggested Readings :**


- Ara, A., Sujhatha, M. & Ramakrishna (2018). *ICT mediation in teaching learning.* New Delhi: Neelkamal Publications.
- Bansal & Kaur. (2016). *Critical understanding of ICT. Ludhiana. Tandon Publication*
- Cheema, S.S., Kumar, G. & Preet, K.(2015). *ICT skill development.* Patiala: Twenty first Century Publication.

- Benkler. Y. (2006). *The wealth of networks: How social production transforms markets and freedom*. Yale: University Press.
- Brian K. W. & Stacey. S. (2005). *Using information technology*. 6th Edition Tata McGraw Hill. Curtin.
- Douglas. C. (2007). *The internet book. Everything you need to know about computer networking and how the internet works*. Prentice Hall.
- DSERT. Karnataka (2012). *Position paper on ICT mediation in education*. DSERT.
- MHRD. GOI (2004 revised 2010). *National ICTC schools scheme, development of education and literacy*. MHRD. New Delhi
- MHRD (2012). *National policy on information and communication technology (ICT) in school education*. MHRD. Government of India.
- Castells. M. (2011). The rise of the network society: The information age: Economy, society, and culture (Vol. 1. II and III). John Wiley and Sons.
- National Mission in Education through ICT www.iitg.ernet in/cet/MissionDocument_20Feb09.pdf
- NCERT (2013). *National repository of open educational resources*. CIET. New Delhi (nrner.gov.in)
- Sinha & Sinha (2005). *Computer fundamentals*. New Delhi: BPB Publications.


**Web resources**


- E-book: Getting Started with Libre Office 3.4 available at http://wiki.documentfoundation.org
- Free Software, Free Society: Selected Essays of Richard M. Stallman. digital book available on www.notahug.com/2002/rms-essays.pdf
- Free Software Foundation. www.fsf.org/
- www.unesdoc.unesco.org/images/0013/001390/139028e.pdf Retrieved on 21.11.2018
- Information and Communication Technology Policy in School Education 2010. www.mhrd.gov.in/sites/upload_files/mhrd/files/RevicsICT_School.pdf Retrieved on 21.11.2018
- http://en.wikibooks.org/wiki/Computers_for_Beginners. An exhaustive source for beginnersRetrieved on 22 11.2018
- National Policy on Information and Communication Technology (ICT) In School Education. http://mhrd.gov.in/sites/upload_files/mhrd/files/upload_document/revised_policy%20document%20oflCT.pdf Retrieved on 22.11.2018
- Understanding MOOCs (2013). edited by Sanjaya Mishra. http://cemca.org.in/ckfinder/userfiles/files/EdTech%20Notes%202_Littlejohn_final_1June2013.pdf Retrieved on 11.10.2018
- Increasing Access through Mobile Learning. (2014) edited by Mohamed Ally and Avgoustos Tsinakos,. http://oasis.col.org/bitstream/handle/11599/558/pub_Mobile%20Learning_web.pdf?sequence=4&isAllowed=y Retrieved on 15.11.2018
- David Porter and Russell Beale (2015) A Policy Brief on MOOCs. http://oasis.col.org/bitstream/handle/11599/825/Policy%20Brief%20on%20MOOCs%20May%2025%2015Q%20print.pdf?sequence=1&isAllowed=y Retrieved on 21.11.2018
- Mobile Learning – UNESCO. Steve Vosloo. 5 minute. http://www.unesco.org/archives/multimedia/index.php?s=films_details&pg=33&id=3601 Retrieved on 21.10.2018
- Expanding Mobile Learning. 2013. UNESCO. Nil Viasnoff (interviewer). 2 minutes. http://www.unesco.org/archives/multimedia/index.php?s=films_details&pg=33&id=2999 Retrieved on 30.11.2018
- How ICT can Support Teacher Training. 2014. UNESCO. Asha Kanwar (speaker 5 minutes, and video

http://www.unesco.org/archives/multimedia/index.php?s=films_details&pg=33&id=3722 and video

- Leveraging Mobile Technology for Education, 2013, UNESCO, Nil Viasnoff (interviewer), 5 minutes, http://www.unesco.org/archives/multimedia/index.php?s=films_details&pg=33&id=2997
- Vidya M. S.(2014), Technology tools for Teachers, http://cemca.org.in/ckfinder/userfiles/files/Technology%20Tools%20for%20Teachers_Low.pdf
- E-learning: A Guidebook of Principles, Procedures and Practices, SOM NAIDU (2006), cemca.org.in/ckfinder/userfiles/files/e-learning_guidebook.pdf
- Internet privacy and freedom of expression (2012) http://unesdoc.unesco.org/images/0021/002182/218273e.pdf
- Educational Multimedia:A Handbook for Teacher-Developers (2003), cemca.org.in/ckfinder/userfiles/files/EdMul_Full.pdf
- EXCEL TUTORIAL, http://www.excel-easy.com/
- TONY BATES, Teaching in a Digital Age, http://open.umn.edu/opentextbooks/BookDetail.aspx?bookId=221www.ictcurriculum.gov.in.

## UNDERSTANDING THE SELF
## COURSE CODE -SOE020451C1012

**Year : II** **Credit : 2**
**Semester : IV** **Max Marks : 50**

**Essence of the Course**

This course focuses on exploration of the self and conflict resolution in social context. The course culminates into realization of the self while developing a broad understanding of what affects development of self- identity. Various processes for understanding the self have also been specified in a broader context of different types personalities one may possess or encounter.

**Objectives:**

After completion of the course **Understanding the Self**, student teachers will be able to:

- identify their own potential and give conscious direction to their lives to take responsibility for their actions
- develop a holistic and integrated understanding of the human self and personality
- develop the capacity for self-reflection and personal integration
- develop the capacity for perspective taking and appreciating different points of view and develop sensitivity towards needs of children by connecting with one's own childhood experiences
- develop the capacity to establish peace within oneself
- develop the capacity to establish harmony within a group and methods of conflict resolution
- explain the meaning and importance of self-concept and self-esteem
- manage conflict effectively

| Teaching Scheme (session)* | | | | Total (L+T+P) | Examination Scheme | | |
|---|---|---|---|---|---|---|---|
| Unit | L | T | P | C | Internal Assessment | External Assessment | Total |
| 1 | 12 | 2 | 3 | 17 | 15 marks (30%) | 35 marks (70%) | 50 Marks (100%) |
| 2 | 12 | 2 | 4 | 18 | | | |
| **Total** | **24** | **4** | **7** | **35** | **15** | **35** | **50** |
| **L= Lecture, T= Tutorial, P= Practicum** | | | | | | | |

**Course Content / Syllabus**

**Unit 1: Exploring the Self**

- Exploring Self Identity and Self Image
- Fundamentals of self-exploration: Self-concept, Self Identity, Self-Esteem, Self-motivation and Self-efficacy
- Factors affecting exploration of self: Heredity and environment
- Understanding the concept of Personality and its various types: Jung's Classification, Sheldon's Classification, Kretschmer's classification

**Unit 2: Development of Self**

- Techniques of Self Reflection (Introspection, Reflective Diary, Reflective Dialogue and discussion, Creative Imagery, Social media like blog and online communities)
- Stress Management and Techniques of Relaxation
- Social Interaction and Group Influence (Social Bonds, Group Formation , Cooperation & Competition)
- Group & Social Harmony
- Development of resilience
- SWOC: Strength, Weaknesses, Opportunities and Challenges

**Transactional Strategies**

- Lecture, PowerPoint presentations, MOOCs and e-platforms.
- Lecture cum discussion, Group Discussions, use of audio and video materials
- Review of various literature available
- Providing reading material to students
- Organising tutorials if needed

**Suggestive List for Assignment/Practicum:**

- Write a self-reflective journal (approx.600-800 words).
- Elaborate your own values towards self and society.
- Report on stress management techniques.
- Group discussion and presentation.

- SWOC analysis of one's own.
- Any other as prescribed by the institution

**Internal Assessment Strategies**:

A total of 15 marks have been allotted under Internal Assessment. The nature of the activity, mode and weightage of marks are as follows.

| S. No. | Activity | Mode | Weightage of Marks |
|---|---|---|---|
| 1 | 2 Sessional tests (Better one will be considered) | Written Test | 5 |
| 2 | Preparation of an assignment on various topics followed by presentation in the classroom and Practicum | Assignment/Practicum or PPT Presentation | 5+2.5=7.5 |
| 3 | Percentage of attendance | | 2.5 |
| **Total Marks** | | | **15** |

**Suggested Readings**


- Adair, J. and Allen, M. (1999). *Time management and personal development.* London: Hawksmere.
- Farrell, T. S. C. (2004). *Reflective practice in action.* Thousand Oaks, CA: Corwin Press, Inc.
- Feldonan, R.S. (2009). *Essentials of understanding psychology* seventh edition. New Delhi: Tata McGraw Hill.
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- Luft J and Ingham H. (1955). *The johari window: A graphic model for interpersonal relations*, University of California Western Training Lab.
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- Snyder, C.R. (2011). *Positive psychology: The scientific and practical explorations of human strengths*. New Delhi: Sage Publishers.


**Web resources**


https://www.annualreviews.org/doi/pdf/10.1146/annurev.ps.38.020187.001503

https://s3.amazonaws.com/academia.edu.documents/42337592/Academic_Self-Concept_and_Self-Efficacy_20160207-29667-6myjng.pdf?AWSAccessKeyId=AKIAIWOWYYGZ2Y53UL3A&Expires=1543320724&Signature=jtfnc6KaNbX%2FvVvlWNjmcFqtPoE%3D&response-content-disposition=inline%3B%20filename%3DAcademic_self-concept_and_self-efficacy.pdf

https://onlinelibrary.wiley.com/doi/epdf/10.1348/014466699164149

http://southeastinforms.org/Proceedings/2008/pnsc/p080527003.pdf

https://slideplayer.com/slide/489285/

http://www.wikihow.com/Identify-Your-Strengths-and-Weaknesses

http://www.mindtools.com/pages/article/coaching-self-awareness.htm

http://www.selfawareness.org.uk/news/understanding-the-johari-window-model

https://tojde.anadolu.edu.tr/tojde42/articles/article_2.htm

http://cie.asu.edu/ojs/index.php/cieatasu/article/viewFile/225/127

http://www.azimpremjiuniversity.edu.in/sites/default/files/userfiles/files/Mythili_Ramchand.pdf

http://www.teachingenglish.org.uk/article/reflective-teaching-exploring-our-own- classroom-practice

http://www.qou.edu/english/conferences/firstNationalConference/pdfFiles/zaidOdeh.pdf

http://cie.asu.edu/ojs/index.php/cieatasu/article/viewFile/225/127

http://digitalcommons.liberty.edu/cgi/viewcontent.cgi?article=1740&context=doctoral

http://www.ucd.ie/t4cms/Reflective%20Practice.pdf

http://www.waikato.ac.nz/tda/pdf/booklets/18_ReflectivePractitioner.pdf

http://www.learning-theories.com/experiential-learning-kolb.html:Kolb'sExperiential Learning

http://www.nathanielbranden.com/ess/ess12.html:Theory of Self Esteem by Nathaniel Brandon

http://www.mindtools.com/pages/article/newTCS_06.htm : Positive thinking.

http://www.mas.org.uk/uploads/articles/Resilience_and_strengthening_resilience_in_individuals.pdf: Resilience

http://www.yorku.ca/rokada/psyctest/rosenbrg.pdf:Rosenberg Self Esteem Scale

http://web.stanford.edu/class/msande271/onlinetools/LearnedOpt.html: Test on Learned Optimism.

http://www.mindfulnessresource.org/category/toronto-mindfulness-scale/:Toronto Mindfulness Scale.

## ENVIRONMENTAL EDUCATION
## COURSE CODE - SOE020452C1012

**Year II**
**Semester IV**

**Credit : 2**
**Max Marks : 50**

**Essence of the Course:**

This courses is designed to develop understanding about the nature of environment and various factors coming in the way of environment preservation. Education has to play a major role in learn to and learn for environment and making pupil teachers aware of various means of preserving environment and sustainable development. This course will also develop an understanding about various aspects of environment based observation and illustration, drawn from live experiences and physical, biological, social aspects of life, rather than abstractions. This course will also develop an awareness about environmental ethics.

**Objectives :**

The student-teachers will be able to:

- familiarize with concept and nature of Environmental Education.
- acquaint with the objectives, and importance of Environmental Education.
- identify various environmental problems affecting the human life.
- develop awareness about environment and associated problems.
- develop knowledge, skills, attitudes, motivation and commitment to work individually and collectively towards the environmental problems solutions and prevention of new ones.
- grasp the significance of Environmental Education.
- recognize the way of protecting and managing of environment.
- analyze the various causes for environmental disequilibrium.

| Teaching Scheme (session)* | | | Total (L+T+P) | Examination Scheme | | |
|---|---|---|---|---|---|---|
| | | | | Internal Assessment | External Assessment | Total Marks |
| Unit | L | T/P | C | | | |
| I | 12 | 4 | 16 | 15 Marks | 35 Marks | 50 Marks |
| II | 12 | 4 | 16 | | | |
| **Total** | **24** | **8** | **32** | **15** | **35** | **50** |

L= Lecture, T=Tutorial, P=Practicum

**Course Content / Syllabus**

**Unit -1 : Conceptual Understanding of Environmental Education**

- Meaning, Definition, components, Scope, Characteristics, Strategy of Environmental Education.
- Aims and Objectives of Environmental Education at primary, secondary, senior secondary level
- Role of Education, School and Teacher in Environment Conservation
- Environmental Ethics: Concept, Approaches, Normative principles of Environmental Ethics.

**Unit 2 : Environmental Issues and Concerns**

- Human interaction and dependency on Environment
- Environmental Disequilibrium: Causes and Problems- Greenhouse Effect, Ozone Depletion, Acid rain. Pollution and its Consequences: Air pollution, water pollution, land pollution, Soil pollution, Noise pollution
- Deforestation and its impacts on environment – Ways of protecting, Management of Environment, Preserving and Restoring of environment.

**Transactional Strategies :**

Lecture cum discussion, Lecture cum demonstration, Use of laptop as audio-visual aid, Assignments on various topics, Presentation and group discussion, and presentations by Pupil Teachers will be encouraged.

**Internal Assessment Strategies :**

A total of 15 marks have been allotted under Internal Assessment. The nature of the activity, mode and weightage of marks are as follows.

| S. No. | Activity | Mode | Weightage of Marks |
|---|---|---|---|
| 1 | Two Sessional tests will be conducted. (Better one will be counted) | Test | 5 |
| 2 | Preparation of an assignment on various topics and it is followed by presentation in the classroom (Group activity)<br>Practicum: | Presentation (PPT) | 2.5+5 |
| 3 | Percentage of attendance | | 2.5 |
| | | **Total Marks** | **15** |

**Practicum :**

- To prepare a report on present status of climate change.
- To prepare a report on recycling of non-decomposable material.
- To prepare a report on environment protection act.
- To prepare a report on environmental standards (any one)
- To prepare a report on environmental issues what you see in your surroundings.
- Any topic suggested by a teacher related to the entire syllabus.

**Suggested Readings :**


- Abbas, G. Northern Areas Strategy for Sustainable Development: Environmental Education. (2003). Retrieved from http://cmsdata.iucn.org/downloads/bp_env_edu.pdf
- Aggarwal. J. C.(2010). *Education for values, environment and human rights.* Delhi: Shipra Publications.
- Briceno, S. & Pitt, C.D. (Ed.). (2018). *New ideas in environmental education.* U.K: Routledge Publication.
- Environmental Ethics. (n.d.). Retrieved December 20, 2018, from http://dspace.vpmthane.org:8080/jspui/bitstream/123456789/4154/1/FC%20Sem%204%20%20ENVIRONMENTAL%20ETHICS.pdf
- Environmental Education – the path to Sustainable Development. (n.d.). Retrieved November 20, 2018, from https://www.pro-e.org/files/environmental_education.pdf
- Environmental Education: A Strategy for the Future. (n.d.). Retrieved November 20, 2018, from https://amardeep.people.stanford.edu/sites/g/files/sbiybj4916/f/documents/EE_Strategy_for_the_Future.pdf
- Environmental Education Framework: Creating an Environment to Educate about the Environment (2003) UNEP. Retrieved from http://www.unep.or.jp/ietc/Focus/pdf/ee-frame.pdf
- Catherine, J. (2011). *Environmental education.* New Delhi: Neel Kamal Publication.
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- Environmental Education Framework: Creating an Environment to Educate about the Environment (2003). UNEP. Retrieved from http://www.unep.or.jp/ietc/Focus/pdf/ee-frame.pdf
- Gopal Dutt, N. H. (2014). *Environmental education.* New Delhi: Neel Kamal Publication.
- Jain, K.C., & Garg, R. (2016). *Environment Education.* Ludhiana: Vijaya Publication.

- Krishnamacharyulu, V. et al. (2017). *Environmental education*. New Delhi: Neo Kamal Publication.
- Nagarjan, K. (2017). *Environmental education*. Chennai: Sriram Publisher.
- Packiam, S. (2018). *Education for sustainable development*. New Delhi: Neel Kamal Publication.
- Palmer, P., & Neal, P. (2003). *The handbook of environmental education*. UK: Routledge Publication.
- Reddy, V. Purushotham et al. (2013). *Environmental education*. New Delhi. Neel Kamal Publication.
- Ravinder, Ch. & Ramakrishna, A. (2017). *Environmental education issues and concerns*. New Delhi: Neel Kamal Publication.
- Sharma, R. A. et. al. (2012). *Environmental education*. New Delhi: Surya Publication.
- Sharma, S. (2016). *Environment Education*. New Delhi: R. Lall Publication.
- Saminathan, B. (2015). *Environmental education*. Retrieved from http://www.bdu.ac.in/ede/docs/ebooks/B-Ed/II/ENVIRONMENTAL%20EDUCATION.pdf
- Verma, K. & Kaur, G. & Singh, P. (2010). *Introduction to environment*. New Delhi: Indira Gandhi National Open University.

**Web Sources:**

- http://shodhganga.inflibcet.ac.in/bitstream/10603/76004/8/08_chapter%202.pdf **Retrieved November 30, 2018**
- https://www.unescap.org/sites/default/files/CH15.PDF **Retrieved November 30, 2018**
- https://www.pro-e.org/files/environmental_education.pdf **Retrieved November 30, 2018**
- http://envfor.nic.in/divisions/ic/wssd/doc4/consul_book_persp.pdf **Retrieved November 30, 2018**
- https://wedocs.unep.org/bitstream/handle/20.500.11822/9851/-The_United_Nations_Environment_Programme_and_the_2030_Agenda_Global_Action_for_People_and_the_Planet-2015EO_Brochure_WebV.pdf.pdf?sequence=3&isAllowed=y **Retrieved November 30, 2018**
- https://nptel.ac.in/courses/120108004/module1/lecture1.pdf Retrieved December 3, 2018
- http://publishing.unesco.org/chapters/978-92-3-104039-9.pdf Retrieved December 5, 2018
- http://ncert.nic.in/book_publishing/environ_edu/eci.pdf Retrieved December 5, 2018
- http://www.ncert.nic.in/rightside/links/pdf/syllabus/vol1/08Environmental%20(III-V).pdf Retrieved December 11, 2018
- http://www.hbcse.tifr.res.in/resources/talks-by-hbcse-members/jr-2/utsav-nmsf-phl-feb2013.pdf Retrieved December 11, 2018
- https://nios.ac.in/media/documents/dled/Block1_505.pdf Retrieved December 11, 2018
- http://www.ncert.nic.in/rightside/links/pdf/framework/english/nf2005.pdf. Retrieved December 11, 2018

## YOGA EDUCATION

## COURSE CODE - SOE020453C1012

**Year: II** **Credit : 2**

**Semester: IV** **Max Marks : 50**

**Essence of the Course**

This course aims at development of understanding of fundamentals of Yoga and Yoga Education among students. It will cover concept and components, importance and basic principles of Yoga, Ashtang Yoga of Patanjali, Yogic diet and its importance.

**Objectives** : The students will be able to:

- discuss how yoga and yoga practices are important for healthy living.
- explain the different limbs of Ashtanga Yoga.
- state the different types of Yogasanas.
- derive how yoga and education is complementary to each other.
- demonstrate some important asanas and pranayama
-

| Teaching Scheme (session)* | | | | Total (L+T+P) | Examination Scheme | | |
|---|---|---|---|---|---|---|---|
| | | | | | Internal Assessment | External Assessment | Total Marks |
| Unit | L | T | P | C | | | |
| I | 14 | 4 | 12 | 30 | 15 Marks | 35 Marks | 50 Marks |
| II | 10 | 2 | 18 | 30 | | | |
| **Total** | 24 | 6 | 30 | 60 | **15 Marks** | **35 Marks** | **50 Marks** |
| **L=Lecture, T=Tutorial, P=Practical** | | | | | | | |

**Course Content / Syllabus**

**Unit I : Introduction to Yoga Education**

- Yoga Education: concept, objectives and scope
- Importance of Yoga Education in daily life
- Difference between Yoga Asana and Physical exercise

- Methods and benefits of Asanas. Pranayama and Concentration.
- Pranayama: Meaning. Process and Types (Kapalbhati. Anulom Vilom, Bhramari. Ujjayi. Bhastrika, Kumbhak. Nadi Shodhan)
- Surya Namaskar: Its components and benefits.
- Role of Yoga Education in Character building.
- Role of yoga practice in developing concentration, will power and discipline.

**Unit 2 : Yogasana and Pranayama**

- Patanjali's Ashtang Yoga
- Yogasana: Meaning, Importance and Advantages
- Types of Yogasana: Sitting postures (Sukhasana, Siddhasana, Padmasana, Vajrasana, Paschimottanasana, Yoga mudra. Matsyasana, Ardha Matsyendrasana, Gomukhasana),
- Standing postures (Tadasana, Trikonsana, Vrikshana. Garudasana. Ardh Chakrasana. Chakrasana, Natarajasana,Virabhadrasana, Utkatasana)
- Upside postures (Halasana, Pinch Mayurasana, Sarvangana, Sheersasana)
- Laying postures (Uttanpadasana. Kampidasana. Vipreet Karni, Adhomukh Vakrasana, Bhujangasana, Dhanursana. Mayurasana).

**Practical**

- Demonstration of various sitting postures mentioned in the syllabus
- Demonstration of various standing postures, Upside postures, and Laying postures along with description of their benefits and cautions while practicing.
- Demonstration of various Pranayamas along with description of their benefits and cautions while practicing.
- Record of practical experiences of practicing Yogasanas/Pranayama.
- Any other as decided by the institution.

**Transactional Strategies**

**Unit 1:** Lecture cum discussion

- Review of various literature available on yoga
- Demonstration of yogic practices

**Unit 2:** Group discussion and presentation

- Review of various ancient literature and discuss with pupil teacher and Encourage them to find out practice yogic activities.
- Use of PPT
- Lecture cum demonstration

- Panel discussion

**Internal Assessment Strategies :**

A total of Fifteen marks have been allotted under Internal Assessment. The nature of the activity, mode and weightage of marks are as follows:

| S. No. | Activity | Mode | Weightage of Marks |
|---|---|---|---|
| 1 | Demonstration of Yogasanas/Pranayamas | Practical | 5 |
| 2 | Preparation of an assignment on various topics and it is followed by presentation in the classroom (Group activity) Practicum | Assignment & Presentation (PPT) | 2.5+5 |
| 3 | Percentage of attendance | | 2.5 |
| | **Total Marks** | | **15** |

**Suggested Readings**


- Kaul, H.K. (2013). *Yoga asana for everyone*. Surjeet Publishers.
- Kubalker, R. (2015). *Know your stress-manage*, Neel Kamal Publishers.
- NCERT (2015). *Yoga: A healthy way of living upper primary stage*, New Delhi (Also available in Hindi)
- NCERT (2015). *Yoga: A healthy way of living secondary stage*, New Delhi. (Also available in Hindi)
- Besant, A. (2005). *An introduction to yoga,* New Delhi: Cosmo.
- Mangal, S.K., Mangal,U.and Mana, S. K.(2009). *Yoga education*, New Delhi: Arya Publication.
- Omand, S.(2006). *Patanjali yoga,* Pradeep Gorakhpur: Gita Press.
- Pramanik, T.N. (2018). *Yoga Education.* New Delhi: Sports Publication.
- Yadav, Y.P. and Yadav, R. (2003). *Art of yoga*, New Delhi: Friends.
- Yogacharya, O. S. (2007). *Freedom of body and mind: yogasanas, pranayam and meditation*. New Delhi: Rawat.

Web Resources:

https://www.rishikulyogshala.org/top-10-sitting-yoga-poses-asanas/ Retrieved on 15.11.2018
https://yogainternational.com/article/view/ground-your-home-practice-with-standing-poses Retrieved on 25.10.2018
https://www.bookyogaretreats.com/news/yoga-inversions Retrieved on 22.10.2018
http://www.kkhsou.in/4mobile/deledunits/Course9Eng/unit1.pdf Retrieved on 16.10.2018
https://www.anandapaloalto.org/ashtanga-yoga/ Retrieved on 24.10.2018
https://www.yogajournal.com/practice/the-eight-limbs Retrieved on 25.10.2018
https://en.wikipedia.org/wiki/Yoga_Sutras_of_Patanjali Retrieved on 14.11.2018
https://www.disruptsports.com/5-precautions-to-note-before-starting-yoga/ Retrieved on 16.11.2018
https://www.healthandyoga.com/html/yogaadvice.aspx Retrieved on 18.11.2018

## EDUCATIONAL ADMINISTRATION AND MANAGEMENT
## COURSE CODE -SOE020454DCEC1012

**Year** II
**Semester** IV

**Credit:2**
**Max Marks: 50**

**Essence of the Course :**

This course covers the nature of the educational administration and management. Education has to play a major role in preparing the youth for educational administration and making people aware of various functions of educational administration and management. Emphasis is also given on school management, school organization and school administration in India.

**Objectives :**

After completing this course, the student-teachers will be able to:

- acquaint with the concept, objectives and importance of educational administration in India.
- develop awareness of various functions of educational administration and management.
- develop some leadership qualities in themselves.
- develop awareness of educational administration at local, state and central level.
- undertake practical participation in school activities as administrative and managerial work. (These activities would have been observed and practiced during the 16-week Internship in schools)
- inculcate friendly environment through proper functioning of educational administration and management.

| Teaching Scheme(session)* | | | Total (L+T+P) | Examination Scheme | | |
|---|---|---|---|---|---|---|
| | | | | Internal Assessment | External Assessment | Total Marks |
| Unit | L | T/P | C | 15Marks | 35 Marks | 50 Marks |
| I | 12 | 4 | 16 | | | |
| II | 12 | 4 | 16 | | | |
| **Total** | **24** | **8** | **32** | **15 Marks** | **35 Marks** | **50 Marks** |
| **L= Lecture, T=Tutorial, P=Practicum** | | | | | | |

**Course Content / Syllabus**

**Unit 1: Concepts Understanding the Concepts of Educational Administration, Educational Management and Resources**

- School Administration: Meaning, Scope, Principles and Approaches.
- Educational Management: Meaning Scope, Principles and Approaches.
- Difference between School Administration and School Management
- Human and Physical Resources of School
- Headmaster/ Principal : Qualities, Role and functions

**Unit 2 : Role & Function of Various Agencies & and Techniques of Educational Administration and Management**

- Administration of School education at different levels – local, district, state and national (Panchayats, zilaParisad, SCERT, DIET, SIET, NCERT, IASE, NIEPA)
- Methods and Techniques of Teaching Educational Administration and Management (Field trips, Role play, Debate, Projects)

**Transactional Strategies:**

- Lecture cum discussion on concept and objectives.
- Organization of debates quiz on issues related to Educational Administration and Management.
- Sharing experiences of educational administrative.
- Review of existing role & functions of educational administrative bodies.
- Evaluation of existing materials prepared of reports and discussion.
- Assignments of various topics
- Demonstration.

**Internal Assessment Strategies:**A total of 15 marks have been allotted under Internal Assessment. The nature of the activity, mode and weightage of marks are as follows.

| S. No. | Activity | Mode | Weightage of Marks |
|---|---|---|---|
| 1 | Two Sessional tests will be conducted (better one will be considered). | Test | 5 |
| 2 | Practicum/Preparation of an assignment on various topics and it is followed by presentation in the classroom (Group activity) | Presentation (PPT) | 2.5+5 |
| 3 | Percentage of attendance | | 2.5 |
| | | **Total Marks** | **15** |

**Practicum :**

- Preparation of chart on Educational Administration and Management
- Visit to field realities to know the role and functions of Headmaster/ Principal/Teacher.
- Posters on various issues.
- Presentation on various Administrative activities.

**Suggested Readings:**


- Bush T., L.B.(2003). *The principles and practice of educational management* (Edited). New Delhi: Sage Publications.
- Bush. T. (2013) *Educational management. administration & leadership*. New Delhi: Sage Publications
- Chauhan,S.(2012). *Educational management*. New Delhi: Pearson Publication.
- Dhillan. S.S. (2019). *Educational administration: management and leadership*. New Delhi: Gyan Geeta Publications.
- Lunenburg, F.C. & Orenstein. A.C. (2012).*Educational administration- Concept & practices*. Canada, USA: Wadsworth. Cengage Learning Solutions.
- Luthans, F. (2005). *Organisational behavior* New York: McGraw – Hills Inc.
- McCaffery. P. (2004) *The higher education manager's handbook*, NewYork and Canada: Routledge.
- Nair. S.R. (2004).*Organizational behaviour- Texts and cases*. Mumbai: Himalaya Publication.
- Nangia, S.B. (2009). *Educational administration*. New Delhi: APH Publishing Corporation Publishing House.
- Nangia, S.B.(2009). *Educational administration*, New Delhi: APH Publishing Corporation Publishing House.
- Northouse, P. (2018). *Leadership theory and practice*. New Delhi: Sage Publications.
- Prasad, A. (2007). *University education administration and the law*. New Delhi: Deep& Deep Publications.
- Penna.V. (2004).*managerial skills in educational administration*. New Delhi: Deep& Deep Publications Pvt. Ltd.
- Rita. S. (2004). *Assessment and accreditation in higher education*. New Delhi: Association of Indian Universities.
- Sayeed. O. B. and Pareek. U. (2000). *Actualizing managerial roles*. New Delhi: Tata McGraw-Hill Publishing Company Limited.
- Sharma. R. A. (2009). *Educational administration &management*. Meerut: R Lal Book Depot.
- Sindhu, I S.(2012). *Educational administration & management*. New Delhi: Pearson Publications
- Srivastav, A.K. (2009). *Educational administration policy: planning and survey*. New Delhi. Kunal Books.

## LIFE SKILLS EDUCATION
## COURSE CODE -SOE020455DCEC1012

**Credit : 2**
**Max Marks: 50**

**Year II**
**Semester IV**

**Essence of the Course:**

This course aims at developing theoretical as well practical foundations of life skill education. The present course covers topic intended to promote personal, social and emotional well-being of the learners.

**Objectives :**

After completing this course, the student-teachers will be able to:

- define life skills education
- interpret the concept and significance of life skills education
- describe the theoretical foundations of life skills education
- develop and apply thinking skills in various spheres of life
- develop skills to cope with emotions and stress
- apply social and negotiation skills in day-to-day life
- comprehend and apply the special strategies to develop life skills

| Teaching Scheme(session)* | | | Total (L+T+P) | Examination Scheme | | |
|---|---|---|---|---|---|---|
| | | | | Internal Assessment | External Assessment | Total Marks |
| Unit | L | T/P | C | 15 Marks | 35 Marks | 50 Marks |
| I | 12 | 4 | 16 | | | |
| II | 12 | 4 | 16 | | | |
| **Total** | **24** | **8** | **32** | **15 Marks** | **35 Marks** | **50 Marks** |

L= Lecture, T=Tutorial, P=Practicum

**Course Content / Syllabus**

**Unit -1 : Introduction to Life Skills**

- Life Skills: Concept and significance of Life Skills
- Thinking: Critical and Creative thinking, Problem Solving and Decision Making
- Coping Skills: Coping with Emotions and Coping with Stress
- Social and Negotiation Skills: Self Awareness, Empathy, Effective Communication and Interpersonal Relationship

**Unit 2 : Strategies of Life Skills Development**

- Strategies of Life Skills Development: Classroom Discussion, Brainstorming, Role-plays, Audio and visual activities, Case Studies, Storytelling, Debates
- Role of teacher in encouraging them to practice core life skills in daily life

**Transactional Strategies :**

Lecture cum discussion, Group discussion and presentation, Brainstorming Session, Use of PPT, Assignments on various topics, Lecture cum demonstration, Preparation of activity based on the strategies of life skills development in groups and discussion, Debate on various problems, panel discussion, In depth analysis of various life skills by the student teachers and presentations will be encouraged.

**Internal Assessment Strategies :**

A total of 15 marks have been allotted under Internal Assessment. The nature of the activity, mode and weightage of marks are as follows:

| S. No. | Activity | Mode | Weightage of Marks |
|---|---|---|---|
| 1 | Two Sessional tests will be conducted (better one will be considered). | Test | 5 |
| 2 | Preparation of an assignment on various topics and it is followed by presentation in the classroom (Group activity) & Practicum | Presentation (PPT) | 2.5+5 |
| 3 | Percentage of attendance | | 2.5 |
| | | **Total Marks** | **15** |

**Practicum :**

- The activities listed in Unit II with respect to the process and methods of Life Skills will be taken up in workshops to initiate the student-teachers with respect to the dynamics of the same.
- The Core Life Skills will also be demonstrated through role plays on diverse issues in the form of workshops.
- The student-teachers shall also engage in reflection on different core Life Skills being displayed by children in schools during their field engagement.
- Human animal interface: Case of study of a domestic/institutional animal/with human being.

**Suggested Readings :**


- Life Skills Based Education. (2011). Wikipedia. Retrieved from: http://en.wikipedia.org/wiki/Life_skills-based_educaion
- Life Skills Based Education CCE. (2009). CBSE. Retrieved from: http://www.cbse.nic.in/cce/life_skills_cce.pdf
- Ministry of Education. (2006). Senior Secondary Phase. Republic of Namibia. Retrieved from: http://www.nied.edu.na/publications
- Delors, Jacques (1997). Learning: The Treasure Within, UNESCO, Paris.
- Nair .V. Rajasenan, (2010). Life Skills, Personality and Leadership, Rajiv Gandhi.2 National Institute of Youth Development, Tamil Nadu. Page 8 of 62 UNESCO (1997).
- Adult Education: The Hamburg Declaration, UNESCO, Paris..3 UNESCO (2005).
- Quality Education and Life Skills: Darkar Goals, UNESCO, Paris..4 WHO (1999).
- Partners in Life Skills Education: Conclusions from a United Nations.5 Inter-Agency Meeting, WHO, Geneva.
- Nair. A. Radhakrishnan, (2010). Life Skills Training for Positive Behaviour, Rajiv.6 Gandhi National Institute of Youth Development, Tamil Nadu.

## GUIDANCE & COUNSELLING
## COURSE CODE -SOE020456DCEC1012

**Year II**
**Semester IV**

**Credit : 2**
**Max Marks : 50**

**Essence of the Course:**

This course aims at providing students with basic understanding of guidance and counselling. It also aims at equipping student-teachers with the capability of drawing out the true potentials of the learners. This course will help student- teachers understand the basic concept and procedure of counselling which in turn them identify the problem areas affecting learners' understanding of concepts and modify their instructions accordingly.

**Objectives :**

The student-teachers will be able to:

- explain the concept and importance of guidance
- comprehend the concept and importance of counselling.
- identify the principles , issues , problems and procedures of guidance & counselling
- apply the concept of testing in guidance & counselling.
- select appropriate test to identify the problem and strength areas of the learners.

**Transactional Strategies :**

| Teaching Scheme(session)* | | | Total (L+T+P) | Examination Scheme | | |
|---|---|---|---|---|---|---|
| | | | | Internal Assessment | External Assessment | Total Marks |
| Unit | L | T/P | C | | | |
| I | 12 | 4 | 16 | 15Marks | 35 Marks | 50 Marks |
| II | 12 | 4 | 16 | | | |
| **Total** | **24** | **8** | **32** | **15 Marks** | **35 Marks** | **50** |
| **L= Lecture, T=Tutorial, P=Practicum** | | | | | | |

**Course Content / Syllabus**

**Unit -1 : Fundamentals of Guidance & Counselling**

- Guidance and Counselling: Concept, Need & Importance.
- Principles of Guidance and Counselling.
- Personal, Educational and Vocational Guidance.
- Role of teacher and Principal as a Counselling.
- Organization of Guidance Programmes in schools.
- Relationship of Guidance and Counselling.

**Unit 2 : Counselling Services & Ethics**

- Types of Counselling services.
- Process of Guidance and Counselling.
- Counselling Skills.
- Characteristics of Counsellor.
- Directive, Non-directive and Eclectic Counselling ,Individual& Group Counselling.
- Professional ethics of Counsellors.

**Transactional Strategies :**

Lecture cum discussion, Use of PPT, Assignments on various types of knowledge, presentation and discussion, Lecture cum demonstration, Ask pupil teachers to prepare write up on various maxims of education, Preparation of activity based curriculum in groups and discussion.

**Internal Assessment Strategies :** A total of 15 marks have been allotted under Internal Assessment. The nature of the activity, mode and weightage of marks are as follows.

| S. No. | Activity | Mode | Weightage of Marks |
|---|---|---|---|
| 1 | Two Sessional tests will be conducted.(better one will be considered). | Test | 5 |
| 2 | Practicum/Preparation of an assignment on various topics and it is followed by presentation in the classroom (Group activity) | Presentation (PPT) | 2.5+5 |
| 3 | Percentage of attendance | - | 2.5 |
| | | **Total Marks** | **15** |

**Practicum:**

- Case study of an adolescents and preparation of reports
- Elaborate your own values towards self and society.
- Report on stress management techniques.
- Any other project/assignment given by the institution

**Suggested Readings :**


- Feldonan, R.S. (2009). *Essentials of understanding psychology seventh edition*, Tata Mc Graw Hill, New Delhi.
- Gladding, R.(2018). *Introduction to counseling*, New Delhi : Pearson.
- Goel, B. S. (1988). *Psycho-Analysis and meditation*, Third Eye Foundation of India. Sonepat, Haryana.
- Hadfield, J. A. (1983). *Psychology and morals*, Methuen & Co. London.
- Kubalker, R. (2015). *Know your stress-manage your stress*, Neel Kamal Publishers.
- Oberoi, S.C (2015). *Educational vocational guidance & counselling*.
- Sheorron, B. (2008). *The presentation skills workshop*, Prentice Hall of India, New Delhi.
- Snyder, C.R. (2011). *Positive psychology*: The Scientific and Practical Explorations of Human Strengths. Sage Publishers.
- Steve, D. (2012). *The basics of communication:* A relational Perspective Sage Publishers.
- Topichik, G.S. (2008). *Managing workplace negativity*, PHI. Delhi.


**Web Resources :**

- Systemic Reforms for Curriculum Change, http://www.ncert.nic.in/new_ncert/ncert/rightside/links/pdf/focus_group/Systemic_reforms_final..pdf
- Curriculum, Syllabus and Textbooks, http://www.ncert.nic.in/new_ncert/ncert/rightside/links/pdf/focus_group/cst_final.pdf.

## HEALTH AND PHYSICAL EDUCATION
## COURSE CODE - SOE020457DCEC1012

**Year II**
**Semester IV**

**Credits: 2**
**Max Marks: 50**

**Essence of the Course:**

This subject area adopts a holistic definition of health within which physical education contributes to the physical, social, emotional and mental aspects of health there are many opportunities for cross curricular learning and integration in other subject area like science, social science and languages. This subject focuses on applied learning and therefore, innovative approaches need to be adopted for transaction of this curriculum.

**Objective :** The course will enable the pupil teachers to :

- be conscious towards the development of holistic health by understanding its various dimensions and determinants.
- develop understanding about fundamentals of physical and health education.
- adopt preventive measures from common communicable diseases by acquiring knowledge about these.
- identify the nature of injuries and to provide first aid.
- create awareness on different aspects of health and fitness.
- develop positive attitude towards health and physical education.
- comprehend various policies and programmers related to health & physical education.
- help them to understand the process of assessment of health and physical fitness

| Teaching Scheme (session)* | | | Total (L+T+P) | Examination Scheme | | |
|---|---|---|---|---|---|---|
| | | | | Internal Assessment | External Assessment | Total Marks |
| Unit | L | T/P | C | 15 Marks | 35 Marks | 50 Marks |
| I | 15 | 3 | 18 | | | |
| II | 15 | 2 | 17 | | | |
| **Total** | **30** | **5** | **35** | **15 Marks** | **35 Marks** | **50 Marks** |

**L= Lecture, T=Tutorial, P=Practicum**

**Course Content / Syllabus**

**UNIT 1: Health, Wellness and areas of concern**

- Health: Concept, definition, dimensions and determinants.
- Health Education: Definition, aims and objectives.
- Concept of Wellness and measures to ensure wellness
- Communicable Diseases: Mode of Transmission, Methods of Prevention and Control
- Nutrition: Elements of Balanced Diet, Food habits

**UNIT 2: Physical Education and Integrated Personality**

- Physical Education: Concept, definition, aims and objectives
- Need, scope and Importance of Physical Education Programs at different school levels
- Rules, Regulations and skills of any one of the Games/events: Hockey, Badminton, Volleyball, Football.
- Concept of integrated personality and its realization through physical education program.

**Transactional Strategies**

The following methods may be adopted :

- Interactive discussion, group-work, sharing of experiences, organizing various activities, analyzing various topics by using chart, photographs and other materials on aspects of health-related issues.
- Organizing school health check-ups, practical classes for first aid, blood donation, self-defense, awareness rally in nearby areas.
- Lecture, PowerPoint presentations, MOOCs and e-platforms.
- Lecture cum discussion, Group Discussions, use of audio and video materials
- Review of various literature available
- Providing reading material to students
- Organising tutorials if needed

**Internal Assessment Strategies :**

A total of 15 marks have been allotted under Internal Assessment. The nature of the activity, mode and weightage of marks are as follows.

| S. No. | Activity | Mode | Weightage of Marks |
|---|---|---|---|
| 1 | Two Sessional tests will be conducted (better one will be considered) | Test | 5 |
| 2 | Preparation of an assignment on various topics and it is followed by presentation in the classroom (Group activity) & Practicum | Assignment/ Practicum or Presentation through PPT | 2.5+5 |
| 3 | Percentage of attendance | - | 2.5 |
| | | **Total Marks** | **15** |

**Assignment/ Practicum:**

- Prepare a Project Report on: Three types of Sports Ground.
- Write a detailed account of your participation in any team game (hockey, Volleyball and Football) or individual game.
- Write a detailed account of your participation in any Self-defense training camp.
- Write a detailed account of your participation in any Blood donation camp.
- Write a detailed account of your participation in Health Check up camp.
- Write a Project Report on Awareness rally for prevention from communicable diseases.
- Any other, as decided by the institution.

**Suggested Readings :**


- Ajmer, S. (2003). *Essentials of physical education.* New Delhi: Kalyani Publishers.
- Chandra, S., Sothi, &Krishnan P. (2005). *Health education and physical education.* Delhi: Surjeet Publications.
- Charles, B. A. (1992). *Foundation of physical education and sport.* New Delhi: B1 Publication.
- John E, Nixon, Ann E. jewett.1980. "An Introduction to Physical Education, Thomson Learning 9th edition London.
- Kanele, B. S., & Kumar, C. P. (1996). *Text book on health and physical education.* Ludhiana: Kalyana Publishers.
- Mangal, S. K. (2005). *Health and physical education.* Ludhiana: Tandon Publication book market.
- Nash T.N. (2006). *Health and physical education.* Hydereabad: Nilkamal Publishers.

- Prasad, Y. V. (2006). *Method of teaching physical education*. New Delhi: Discovery Publishing house.
- Ramachandran, L.T., & Dharmalingam. (1993). *Health education. A new approach*. New Delhi: Vikas Publishers Ltd.
- Reema, K. (1996). *Physical fitness*. New Delhi: Khel Sahitya Sports Publication.


**Web Resources**

https://en.unesco.org/themes/education-health-and-well-being
https://www.pwc.in/assets/pdfs/india-publication-working-towards-wellness.pdf
http://www.ncert.nic.in/programmes/aep/pdfs/module%2011%20rti,%20sti%20and%20relationship%20with%20hiv.pdf
https://www.pdhpe.net/better-health-for-individuals/what-does-health-mean-to-individuals/meanings-of-health/dimensions-of-health/
https://sporttudomany.uni-eszterhazy.hu/public/uploads/organising-sports-events_570f84971d1e4.pdf
http://unesdoc.unesco.org/images/0024/002464/246453e.pdf

## EDUCATION IN INDIAN CONSTITUTION

## COURSE CODE -SOE020458DCEC1012

**Year : II**

**Semester : IV**

**Credit: 2**

**Max Marks : 50**

**Essence of the Course:**

This course aims at developing theoretical as well practical knowledge and awareness about educational provisions in Indian Constitution. The present course covers topic intended to promote personal, social and educational well-being of the learners and nation.

**Objectives :**

After completing this course, the student-teachers will be able to:

- orientate about constitutional provisions of education
- aquitant with the educational policies and acts for education
- develop the sense of democracy and values of equality, justice, freedom, secularism, respect for human dignity and rights
- define the role and duties of central and state government for educational enhancement.
- recognize the importance of universalization of education and RTE Act, 2009
- examine the status of education in special reference to equality and inequality in India critically
- foster the spirit of social responsibility to promote education

| Teaching Scheme (session)* | | | Total (L+T+P) | Examination Scheme | | |
|---|---|---|---|---|---|---|
| | | | | Internal Assessment | External Assessment | Total Marks |
| Unit | L | T | C | | | |
| I | 12 | 4 | 16 | 15 Marks | 35 Marks | 50 Marks |
| II | 12 | 4 | 16 | | | |
| **Total** | **24** | **8** | **32** | **15 Marks** | **35 Marks** | **50 Marks** |
| **L= Lecture, T=Tutorial, P=Practicum** | | | | | | |

**Course Content / Syllabus**

**Unit -1: Constitutional Provisions related to Education**

- Constitutional provisions related to education that reflect national ideals:
- Democracy and the values of equality, justice, freedom, secularism, respect for human dignity and rights.
- Policies, acts and provisions related to education and children with special reference to their contexts (class, caste, tribe, religion, language and gender)
- Role of Central and state governments in the development of education

**Unit 2 : Contemporary Indian Education: Concerns and Issues**

- Constitutional interventions for universalization of education and RTE Act 2009
- Challenges in implementation of RTE Act 2009
- Equality of educational opportunity: Meaning of equality and constitutional provisions and Issues of equality and equity.
- Inequality in schooling: Public-private schools, rural-urban Schools , single teachers' schools and many other forms of inequalities in school systems and the processes leading to disparities

**Transactional Strategies**:

Lecture cum discussion, use of PPT, assignments on various topics, preparation of activity based on the Constitutional provisions in groups and discussion, Debate on various problems, panel discussion, In depth analysis of various life skills by the student teachers and presentations will be encouraged.

**Internal Assessment Strategies :**

A total of fifteen marks have been allotted under Internal Assessment. The nature of the activity, mode and weightage of marks are as follows.

| S. No. | Activity | Mode | Weightage of Marks |
|---|---|---|---|
| 1 | Two Sessional tests will be conducted.(better one will be considered) | Test | 5 |
| 2 | Preparation of an assignment on various topics and it is followed by presentation in the classroom (Group activity) & Practicum | Assignment/ Practicum or Presentation through PPT | 2.5+5 |
| 3 | Percentage of attendance | | 2.5 |
| | | **Total Marks** | **15** |



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66

**Practicum :**

- Reflection on various Constitutional provisions
- Visit in school and assess the provisions of RTE, 2009.
- Survey/Project on Constitutional awareness in education.

**Suggested Readings:**


- Anand, C.L. et.al. (1983). *Teacher and education in emerging in indian society*, New Delhi : NCERT.
- Govt. of India (1986). National Policy on Education, New Delhi : MHRD.
- Govt. of India (1992). Programme of Action (NPE). New Delhi : MHRD.
- Govinda, R. (2011). Who goes to school?: Exploring exclusion in Indian education. Oxford University Press.
- Mohanty, J., (1986). *School education in emerging society*. New Delhi: Sterling Publishers.
- Mukherji, S.M., (1966). *History of education in India*. Baroda:Acharya Book Depot.
- GOI(1964-1966):'Education and National Development''. MHRD, Government of India 1966.
- Education Act. Ministry of HRD, Department of Education, October, 2004.
- NCERT (2002). Seventh all india school education survey, New Delhi : NCERT.
- NCERT (1986). School Education in India – Present Status and Future Needs, New Delhi.
- NCERT. (2005). National curriculum framework. (NCF 2005). New Delhi: NCERT.
- NCERT. (2006a). Position paper-National focus group on education with special needs
- NCERT. (2006b). Position paper-National focus group on gender issues in the curriculum
- NCERT. (2006c). Position paper-National focus group on problems of scheduled caste and scheduled tribe children (NCF 2005). New Delhi: NCERT.
- NCERT. (2006d). Position paper-national focus group on teaching of indian language, New Delhi: NCERT.
- Salamatullah, (1979). *Education in social contex*t, New Delhi : NCERT.
- Sykes, Marjorie (1988): *The story of nai talim*, Wardha:Naitalim Samit.
- UNESCO. (2004) *Education for all: The quality imperative*. Paris : EFA Global Monitoring Report.

## COMPARATIVE EDUCATION
## COURSE CODE -SOE020459DCEC1012

**Year II**
**Semester IV**

**Credit: 2**
**Max Marks: 50**

**Essence of the Course:**

Comparative Education has two complementary goals. First, it should provide students with some of the information and concepts necessary for comparing different educational systems, their contexts, and educational outcomes. Second, it should help students sharpen their own research and analytic skills for independent, comparative insight secondary education system (India, U.K. and U.S.A). If these goals are achieved, students would be able to form judgments about which aspects of a nation's education system are unique to a particular context and which aspects represent features found generally in other schools throughout the world. This ability is important for educators who want to improve education systems anywhere through policy.

**Objectives :** The student-teachers will be able to:

- acquaint with the concepts of comparative education
- recall history and developmental stages of comparative education
- familiar with educational systems in terms of factors and approaches of comparative education
- acquaint with educational systems prevailing in various nations
- assess the efficiency of educational systems of various countries in terms of prevailing trend in those countries
- create a perspective about the implications of educational policies and for solving the educational problems in India
- acquaint about the concept of secondary education and its implication in India, U.K. and U.S.A.
- interpret the need & importance of secondary education and its vocationalization

| Teaching Scheme (session)* | | | Total (L+T+P) | Examination Scheme | | |
|---|---|---|---|---|---|---|
| | | | | Internal Assessment | External Assessment | Total Marks |
| **Unit** | **L** | **T** | **C** | | | |
| I | 12 | 4 | 16 | 15 Marks | 35 Marks | 50 Marks |
| II | 12 | 4 | 16 | | | |
| **Total** | **24** | **8** | **32** | **15 Marks** | **35 Marks** | **50 Marks** |
| L= Lecture, T=Tutorial, P=Practicum | | | | | | |

**Course Content / Syllabus**

**Unit -1 : Conceptual Understanding of Comparative Education**

- Concept of Comparative Education: History and developmental stages of Comparative Education
- Aims of Comparative Education
- Need and scope of Comparative Education
- Approaches to Comparative Education: Historical, Philosophical, Sociological and Problem Approach
- Factors affecting of education system

**Unit 2 :Secondary Education in India, U.K. and U.S.A.**

- Secondary education :Concept, meaning and need
- Secondary education in India, U.K. and U.S.A. (Aims, Content, Methods & Instruction and Evaluation System) and its vocationalization in India.

**Transactional Strategies :**

Lecture cum discussion, use of PPT, assignments on various topics, Lecture cum demonstration, ask pupil teachers to prepare write up on various factors influencing of education system and Comparative Education, debate on aims, content, methods & instruction and evaluation system in India, U.K. and U.S.A., chart preparation on education system in India, U.K. and U.S.A., In depth analysis of various education system by the student teachers and presentations will be encouraged.

**Internal Assessment Strategies :** A total of 15 marks have been allotted under Internal Assessment. The nature of the activity, mode and weightage of marks are as follows.

| S. No. | Activity | Mode | Weightage of Marks |
|---|---|---|---|
| 1 | Two Sessional tests will be conducted. (better one will be considered) | Test | 5 |
| 2 | Preparation of an assignment on various topics and it is followed by presentation in the classroom (Group activity) | Presentation (PPT) | 5 + 2.5 |
| 3 | Percentage of attendance | | 2.5 |
| | | **Total Marks** | **15** |

**Practicum:**

- Write up on various factors influencing of education system.
- Chart preparation on education system in India.
- Reflections on secondary education in India, U.K.and U.S.A.

**Suggested Readings :**


- Baradey, G.Z.F. (1964). *Comparative methods in education*. New Delhi: Oxford and IBH Publishing Co.
- Chaube, S. P.(2009). *Comparative Education.* New Delhi: Vikas Publication.
- Chaube, S. P.(2017). *Features Of Comparative Education.* New Delhi: Vikas Publication.
- Cowen , R. (2017). *Narrating and Relating Educational Reform and Comparative Education*. Switzerland AG. : Springer Nature
- Cramer, I.F. & Brown, G.S. (1965). *Contemporary education: A comparative study of national system*. New York: Harcourt Brace & Company.
- Dent, H.C. (1981). *Educational system of England*. London: George Allen and Unwon.
- Epstein, E. (2016). Why comparative and international education? Reflections on the conflation of names. In P. K. Kubow & A. H. losser (Eds.), *Teaching comparative education: Trends and issues informing practice* (pp. 57–73). Oxford: Oxford Studies in Comparative Education: Symposium Press.
- Hans, N. (1961). *Comparative education*. London: Routledge and Kegan Paul.
- Holmes, B. (2018). Comparative Education : Some Considerations of Method. London: Taylor & Francis Group
- Kandel, I.L. (1963). *Studies in comparative education*. New York: George Harrup.
- Marshall, J.(2019). *Introduction to Comparative and International Education*. New Delhi: SAGE Publication India Pvt. Ltd.
- Parmaji, S, (1984). *Distance education*. New Delhi: Sterling Publishers Pvt. Ltd.
- Rajput, J.S. (2004). *Encyclopedia of indian education*. New Delhi: NCERT.
- Sodhi T.S. (1988). *A text book of comparative education.* New Delhi: Association of Indian Universities, IGNOU.
- William, M. A. (1966). *Planning curriculum for schools.* New York: Holt, Rinehart and Winston.

## EDUCATIONAL LEADERSHIP AND MANAGEMENT
## COURSE CODE:SOE020439GEC3104

**Year : II** **Credit : 4**
**Semester : IV** **Marks : 100**

**Essence of the Course :**

This course covers the nature of the educational administration and management. Education has to play a major role in preparing the youth for educational administration and making people aware of various functions of educational administration and management. Emphasis is also given on school management, school organization and school administration in India.

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

- know and understand the concepts of educational management and leadership
- develop awareness of various functions of educational management.
- understand various styles of leadership
- develop some leadership qualities in themselves.
- develop some leadership qualities in themselves
- understand educational administration in India at local, state and central level

| Teaching Scheme (session)* | | | | Total (L+T+P) | Examination Scheme | | |
|---|---|---|---|---|---|---|---|
| Unit | L | T | P | | Internal Assessment | External Assessment | Total Marks |
| I | 12 | 4 | 0 | 16 | 30 | 70 | 100 |
| II | 12 | 2 | 1 | 15 | | | |
| III | 12 | 3 | 2 | 17 | | | |
| IV | 12 | 3 | 1 | 16 | | | |
| **Total** | **48** | **12** | **04** | **64** | **30** | **70** | **100** |

**Course Content / Syllabus**

**Unit-1 : Educational Management: Conceptual Understanding**

- Meaning, Concept, Needs of Educational Management
- Objectives & Scope of Educational Management
- Educational Manager: Functions and Roles
- Professional Ethics

**Unit -2 : School Management and Communication**

- Role and functions of Headmaster/ Principal/ Teacher
- Process, Human Relations Approach to Management.
- Types of Communication
- Barriers of Communication

**Unit – 3 : Leadership : concept and skills**

- Meaning and Concept of Leadership
- Difference between Leader and Manager
- Leadership Traits and Skills
- Functions and Styles of Leadership

**Unit- 4 : Educational Administrative Bodies in India at National Level: Role & Functions**

- University Grant Commission (UGC)
- National Council of Educational Research and Training (NCERT)
- National University of Educational Planning and Administration (NUEPA)
- Ministry of Human Resource Development (MHRD)
- National Council for Teacher Education (NCTE)

**Transactional Strategies :**

Lectures, field visits to various educational institutions, case studies, assignments, discussions etc.

**Internal Assessment Strategies :**

A total of thirty marks have been allotted under Internal Assessment. The nature of the activity, mode and weightage of marks are as follows.

| S. No. | Activity | Mode | Weightage of Marks |
|---|---|---|---|
| 1 | Two Sessional tests will be conducted (Better one will be considered) | Test | 10 |
| 2 | Preparation of an assignment on various topics and it is followed by presentation in the classroom (Group activity) & Practicum | Assignment & Presentation (PPT) | 05+10 |
| 3 | Percentage of attendance | | 05 |
| **Total Marks** | | | **30** |

**Practicum :**

- Compile articles from newspapers, magazines, and internet discussing present policies and operational strategies of central and state Govt. for secondary education. Prepare a report of entire activity.
- Review research on educational management or management of secondary schools which are used in other countries but not in India.
- Evaluation of management of SSA activities in a district.
- Collect data from relevant sources on student & teachers ratio for secondary level school of your district. Is it according to provision of RTE act? Prepare a report and send it to authorities.
- Examine the effectiveness of any one programme run by central Govt. for secondary students. Present the report in a classroom seminar.

**Suggested Readings:**


- Altrichter, H. and Elliot, J. (2000). *Images of Educational Change*. England: Buckingham Open University.
- Bhattacharya, D.K. (2001). *Managing People*. New Delhi: Excel Books.
- Bush T., L. B. (2003). *Theprinciples and practice of educational management*. (Edited, Ed.). New Delhi: Sage Publications.
- Bush, T. (2013).*Educational management, administration & leadership*. New Delhi: Sage Publications.
- Chauhan,S.(2012). Educational management. New Delhi: Pearson Publication.
- Dawra, S. (2003). *Management thought*. New Delhi: Mohit Publication.
- Harigopal, K. (2001). *Management of organizational change*. New Delhi: Response Books.
- Luthans, F. (2005). *Organisationalbehavior*. New York: McGraw – Hills Inc.
- Lunenburg,F.C. & Orenstein, A.C.(2012).*Educational administration-Concept &practices*. USA: Wadsworth, Cengage Learning Solutions, Canada.
- McCaffery, P. (2004). *The higher education manager's handbook*. NewYork and Canada: Routledge.

- Nau. S.R. (2004).*Organizational behaviour- Texts and cases*. Mumbai: Himalaya Publication.
- Nangia, S.B. (2009). *Educational administration*. New Delhi: APH Publishing Corporation Publishing House.
- Northouse, P. (2018). *Leadership theory and practice*. New Delhi: Sage Publications.
- Owens. R.C. (2001). *Organizational behaviour in education*. Boston: Allyn and Bacon
- Prasad, A. (2007). *Universityeducation administration and the law*, New Delhi: Deep& Deep Publications.
- Punia V. (2004).*Managerial skills in educational administration*. New Delhi: Deep& Deep Publications Pvt. Ltd.
- Rita, S. (2004). *Assessment and accreditation in higher education*. New Delhi: Association of Indian Univesities.
- Sayeed, O. B. and Pareek, U. (2000). *Actualizing managerial roles*. New Delhi: Tata McGraw-Hill Publishing Company Limited.
- Srivastav, A.K. (2009). *Educational administration policy. planning and survey*. New Delhi: Kunal Books.
- Sharma, R. A. (2009). *Educational administration & management*. Meerut: R Lal Book Depot.
- Sindhu, I.S.(2012).*Educational administration & management*. New Delhi: Pearson Publications

# PEACE EDUCATION
## COURSE CODE -SOE020440GEC3104

**Year II**
**Semester IV**

**Credit : 4**
**Max Marks : 100**

**Essence of the Course:**

Peace is considered as one of the main core values out of the five basic human values. The five basic / core human values are Truth, Righteous conduct, Peace, Love and Non-violence. Every teacher must realize the significance of values in individual and social life. In the present scenario Peace Education and Education for Peace, its concept and understanding is of paramount significance in Teacher Education. This course focuses on the concept, importance nature of Peace and Peace education and pedagogy of Peace Education

**Objectives :** The student teacher will be able to:

- Explain the need and importance of peace.
- Know the different approaches to peace.
- Develop personal initiative and resources for the pursuit and Promotion of peace.
- Describe the nature of peace education.
- Manage conflicts of their life and business.
- Appreciate the developments in Peace Education in India and Abroad.
- Understand various methods, techniques and approaches of Peace development.
- Appreciate the importance of 'living together and imbibe in their attitude and behavior.

| Teaching Scheme (session)* | | | | Total (L+T+P) | Examination Scheme | | |
|---|---|---|---|---|---|---|---|
| | | | | | Internal Assessment | External Assessment | Total Marks |
| Unit | L | T | P | C | 30 Marks | 70 Marks | 100 Marks |
| I | 12 | 4 | 0 | 16 | | | |
| II | 12 | 4 | 0 | 16 | | | |
| III | 12 | 4 | 0 | 16 | | | |
| IV | 12 | 4 | 0 | 16 | | | |
| **Total** | **48** | **16** | **0** | **64** | 30 Marks | 70 Marks | 100 Marks |

**Course Content / Syllabus**

**Unit -1 : Conceptual fundamental of Peace**

- Concept and importance of Peace
- Gandhian Concept of Peace
- Different Approaches of Peace

**Unit 2 : Peace Education**

- Peace Education:Meaning, Definition, Concept, Scope
- Aim and objectives of Peace Education
- Organizations involved in promoting peace Education (UNO, UNESCO)

**Unit 3 : Peace for Conflict Management**

- Conflict : Meaning, Nature
- Conflict Management
- Peace and Conflict Management

**Unit 4 : Pedagogy of Peace Education**

Approaches and Techniques for Peace Education:-

- Roll Playing, value based Story-telling
- Group activities (literary activities, games and sports, service activities),
- Counselling, organizing value based co-curricular activities. .

**Transactional Strategies :**

Lecture cum discussion, Tutorials, Brainstorming Session, Use of PPTs, Assignments on different key areas of Peace related issues.

**Internal Assessment Strategies :**

A total of thirty marks have been allotted under Internal Assessment. The nature of the activity mode and weightage of marks are as follows.

| S. No. | Activity | Mode | Weightage of Marks |
|---|---|---|---|
| 1 | Two Sessional tests will be conducted (Better one will be considered) | Test | 10 |
| 2 | Preparation of an assignment on various topics and it is followed by presentation in the classroom (Group activity)& Practicum | Assignment & Presentation (PPT) | 05\10 |
| 3 | Percentage of attendance | | 05 |
| | **Total Marks** | | 30 |

**Practicum – Suggestive List**

- Seminar and group discussion on importance peace in the class.
- Chart preparation on various Peace Education
- Reflection on various conflicts in day to day life.
- Organize mock activities on working of UNO for Peace Education.

**Suggested Readings :**


- Arulsamy, S. (2016). *Peace and value education.* New Delhi: Neelkamal Publication.
- Barash, P. David (2000). *Approaches to peace*. New York: Oxford University Press.
- Charles, K. , & Selvi, A. (2016). *Peace and value education* New Delhi: Neelkamal Publication.
- Galtung, J. (2003). *Searching for peace – the road to transcend*. Sterling Virginia.
- Galtung, Johan (1996). *Peace by peaceful means. peace and conflict*, Development and Civilization. New Delhi: Sage Publications.
- Galtung, Johan (1984). *The struggle for peace*, Ahmedabad. Gujarat Vidyapith.
- Gandhi, M.K. (1944). *Non-violence in peace and war*, Ahmedabad : Navajivan Publishing House.
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- Harris Ian. M. (1998). *Peace education*. London: McFarland & Company Inc Publisher.
- Kapani, M. (2000) *Education in human values – concept and practical implications*. New Delhi: Sterling Publishers.
- National Curriculum Framework (2005) position paper. National Focus group on Education for Peace. New Delhi: NCERT.
- Pandey, S. (2004). *Education for peace. self instructional package for teacher education*, New Delhi: NCERT.
- Sri Sathya Sai Bal Vikas Education Trust (1985) *Curriculum and methodology for integrating human values education*. Prashanthi Nilayam (International Education).
- UNESCO (2001). *Learning the way of peace – a teacher guide to education for peace*". UNESCO

**Web Sources**

- http://www.ncert.nic.in/new_ncert/ncert/rightside/links/pdf/focus_group/education_for_peace.pdf
- www.hdu.ac.in/cde/docs/ebooks/B-Ed/II/PEACE%20EDUCATION.pdf
- http://www.gordontraining.com/free-parenting-articles/the-nature-of-conflict/
- https://journals.sagepub.com/doi/abs/10.1177/106591295100400201?journalCode=prqa
- https://www.amanet.org/training/articles/the-five-steps-to-conflict-resolution.aspx
- https://www.managers.org.uk/knowledge-bank/conflict-management
- *cejsh.icm.edu.pl/cejsh/element/bwmeta1.element.ojs-doi.../10472-10011.pdf*
- *https://www.jagran.com/editorial/apnibaat-the-importance-of-peace-10751783.htmlhttps://www.quora.com/What-is-the-importance-of-peace-in-our-life-Why-and-how-do-you-achieve-it*
- *http://www.eolss.net/sample-chapters/c04/e1-39a-06.pdfhttps://unesdoc.unesco.org/ark:/48223/pf0000150262https://dialog1.webs.com/sejv2i1/samwaad_2.pdf*
- *http://shodhganga.inflibnet.ac.in/bitstream/10603/36399/7/chapter%202.pdf*

# SYLLABUS

## M.Ed.

## (Master of Education)

## School of Education

## Academic Session : 2017-19

# M.Ed. Programme Implementation and Assessment

**1. Curriculum**

The M.Ed. programme is designed to provide opportunity for students to extend as well as deepen their knowledge and understanding of education, specialize in selected areas and also to develop research capacities leading to specialization in either elementary education or secondary education. The curriculum of the two-year M.Ed. programme shall comprise of the following components:

1) A Common Core that includes Perspective Courses, Tool Courses, Teacher Education Course, and A Self-development component;
2) Specialisation Branches where students choose to specialize in any one of the school levels/areas (such as elementary, secondary and senior secondary);
3) Reseach leading to dissertation; and
4) Field immersion/attachment/internship.

There shall be core courses (which shall have about 60% of credits) and specialized courses in elementary education or secondary education and dissertation with about 40% of credits.

**(a) Theory (Core and Specialization) Courses**

The theory courses are divided into core courses and specialization courses. The main core courses shall comprise Perspective Courses, Tool Courses and Teacher Education Courses.

Perspective Courses shall be in the areas of: Philosophy of Education, Sociology-History-Political-Economy of Education, Psychology of Education, EducationStudiesand Curriculum Studies. Tool Courses shall comprise of those in basic and advanced level education research, academic/professional writing and communication skills and educational technology including workshops/courses in ICT. Teacher education courses (which are also linked with the field internship/immersion/attachment in a teacher education institution) shall also be included in the core.

The specialization component/branches shall offerstudents a specialization in one of the school stages-elementary (upto VIII), or secondary and senior secondary (VI to XII). The courses within the school stage specialization shall represent/cover selected thematic areas pertinent to that stage such as: Curriculum, Pedagogy and Assessment; Policy, Economics and Planning; Educational Management and Administration; Education for differently abled; etc. Other specialization may also be planned. A field internship/attachment relevant to the area of specialization shall be organized during the programme.

Critical reflection on gender, disability and marginalisation should cut-across the courses in core and specialization. Similarly skills pertaining to ICT and educational technology should be integrated in various courses in the programme. Besides, yoga education shall form an integral part of the curriculum.

**(b) Practicum**

Organisation of workshops, practicum activities and seminars to enhance professional skill and understanding of the students shall be part of the teaching modality of the various courses.

**(c) Internship and Attachment**

Fields attachments/internships/immersion shall be facilitated with organizations and institutions working in education. These would aim at engaging the students with field-based situations and work in elementary and other levels of educationand to provide an opportunity for reflection and writing on the same. Systematically planned field internship/attachment in a teacher education institutionand in the specialization area chosen by the student shall be organized during the programme.

Close mentorship by faculty in relevant areas should be provided in the programme in the form of tutorials, guided reading groups, field attachmentand guided research dissertation.

**2. Programme Implementation**

The institution will have to meet the following specific demands of this professional programme of the study (M.Ed.):

(i.) Prepare a calendar for all activities, including internship and field attachment. The calendar of the M.Ed. programme shall be synchronised with the academic calendar of the institutions identified for internship and attachment.

(ii.) Submission of a Dissertation which could be based on primary field data or secondary data or a treatise comprising of a long reflective and critical essay on an approved topic shall be compulsory.

(iii.) For the conduct of the dissertation, the ratio of the faculty to students for guidance and mentoring shall be of 1:5.

(iv.) Structured engagement of M.Ed. students with educational sites/fields for not less than 4 weeks resulting in a reflective report. The suggested sites/fields are as follows:

- **a.** Professional pre-service teacher education programme.
- **b.** An organization engaged in the development of innovative curriculum and pedagogic practices.
- **c.** International/National/State institution involved in curriculum design; textbook development; education policy planning, formation and implementation; educational administration and management.
- **d.** In-service training programmes for school teacher.

(v) The institution shall initiate discourse in education by periodically organizing seminars, debates, lectures and discussion groups for students and faculty. Students' participation in the weekly research colloquium/seminar shall be ensured.

(vi) There shall be provision and mechanisms and provisions in the institutions for addressing complaints of students and faculty and for redressal of grievances.

(vii) Mechanisms shall be worked out where faculty other than the ones actually dealing with the course shall be involved in the work of institution.

**3. Assessment**

For each theory course, at least 30% weightage shall be assigned for continuous internal assessment and 70% for examination conducted by the examining body. The weightage for the internal and external assessment for theory and practicum courses shall be such as prescribed by the affiliating university based on the above formulation. The bases of internal assessment may include individual/ group assignment, seminars presentations, field attachment, appraisal reports etc. One-fourth of the total marks/credits/weightage shall be assigned to practicum, internship, field attachment and dissertation.

## Course Structure of Master of Education (M.Ed.) under Choice Based Credit System (Academic Session:2017-19)

### Total No. of Credits in Two Years= 88+8=96

### M.Ed. Semester- I

| S. No. | Course Credit | Course Code | Paper Title | Total Marks (Theory + Practicum) | Credits (Theory) | Classes Teaching Hours Per Week | Credits: Practicum (Engagement With The Field) | Practicum/ Tutorials Hours Per Week ( Per Semester) | Total Hours Per Week (Per Semester) | Internal/ External Assessment/ Practical Weightage | Theory: Assessment Weightage |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 4 | SOE010101C3014 | Psychology of Learning and | 100 | 3 | 3 | 1 | 2 | 5 | 30% | 70% |
| 2 | 4 | SOE010102C3014 | Historical, Political & Economic Foundations of Education | 100 | 3 | 3 | 1 | 2 | 5 | 30% | 70% |
| 3 | 4 | SOE010103C3014 | Educational Studies | 100 | 3 | 3 | 1 | 2 | 5 | 30% | 70% |
| 4 | 4 | SOE010104C3014 | Introduction to Educational Research | 100 | 3 | 3 | 1 | 2 | 5 | 30% | 70% |
| 5 | 2 | SOE010105C0022 | ICT in Education | 50 | 0 | 0 | 2 | 4 | 4 | 100% | - |
| 6 | 2 | SOE010106C0022 | Development of Self: Yoga Education | 50 | 0 | 0 | 2 | 4 | 4 | 100% | - |
| 7 | 2 | SOE010107C0022 | Dissertation Part-I | 50 | 0 | 0 | 2 | 4 | 4 | 100% | - |
| 8 | 4 | | Taken from other Department | 100 | 4 | 4 | 0 | 0 | 4 | 30% | 70% |
| **Total** | **26** | | | **650** | **16** | **16** | **10** | **20** | **36** | | |

**Practicum/ Hands on/ students Activity / Seminar/ Workshop/etc; during Practicum hours**

- 1 credit Theory=16 hours in a semester
- 1 credit practical=32 hours in a semester
- 1 credit=25 Marks
- Viva-Voice exam for course 05 will be conducted by the external examiner at the end of the semester and weightage will be 40% external & 60% Internal.
- **A student has to take 4 credits course from other department course.**
- **Courses Offered to other department : Personality Development (4 Credits)**

## M.Ed. Semester- II

| S. No. | Course Credit | Course Code | Paper Title | Total Marks (Theory + Practicum) | Credits (Theory) | Classes Teaching Hours Per Week | Credits: Practicum (Engagement With The Field) | Practicum Hours Per Week ( Per Semester) | Total Hours Per Week (Per Semester) | Internal/ External Assessment / Practical Weightage | Theory: External Assessment Weightage |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 9 | 4 | SOE010208C3014 | Philosophical Foundations of Education | 100 | 3 | 3 | 1 | 2 | 5 | 30% | 70% |
| 10 | 4 | SOE010209C3014 | Sociological Foundations of Education | 100 | 3 | 3 | 1 | 2 | 5 | 30% | 70% |
| 11 | 4 | SOE010210C3014 | Curriculum Studies | 100 | 3 | 3 | 1 | 2 | 5 | 30% | 70% |
| 12 | 4 | SOE010211C3014 | Pre-Service & In-Service Teacher Education | 100 | 3 | 3 | 1 | 2 | 5 | 30% | 70% |
| 13 | 2 | SOE010212C0022 | Academic Writing | 50 | 0 | 0 | 2 | 2 | 2 | 30% | 70% |
| 14 | 2 | SOE010213C0022 | Internship :Teacher Education Institute | 50 | 0 | 0 | 2 | 4 | 4 | 100% | |
| 15 | 4 | | Taken from other Department | 100 | 4 | 4 | 0 | 0 | 4 | 30% | 70% |
| **Total** | **24** | | | **600** | **16** | **16** | **8** | **14** | **30** | | |

**Practicum/ Hands on/ Students Activity / Seminar/ Workshop/etc; during Practicum hours**

- **1 credit Theory=16 hours in a semester**
- **1 credit practical=32 hours in a semester**
- **1 credit=25 Marks**
- **Viva-Voice exam for course 13will be conducted by the external examiner at the end of the semester and weightage will be 40% external & 60% Internal.**

**Internship Programme :**

- Internship should be organized in such way that all students' engagement for a continuous period of 4 weeks in a school/teacher education institute for field experience associated with the specialization choose. Since the M.Ed. programme structure proposed in this reports is associated on schools and teacher education institutions (and other sites) based activity, the M.Ed. calendar should be development keeping in mind the schedule of these institutions.
- **A student has to take 4 credits course from other department course.**
- **Courses Offered to other department : Introduction to Academic Writing (4 Credits)**

## M.Ed. Semester- III

| S. No. | Course Credit | Course Code | Paper Title | Total Marks (Theory + Practicum) | Credits (Theory ) | Classes Teaching Hours Per Week | Credits Practicum (Engagement With The Field) | Practicum Hours Per Week ( Per Semester) | Total Hours Per Week (Per Semester) | Internal/ External Assessment / Practical Weightage | Theory External Assessment Weightage |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 16 | 4 | SOE010314C3014 | Advance Research Methods | 100 | 3 | 3 | 1 | 2 | 5 | 30% | 70% |
| 17 | 4 | SOE010315C3014 | Inclusive Education: Gender, Disability and Marginalization | 100 | 3 | 3 | 1 | 2 | 5 | 30% | 70% |
| 18 | 2 | **Any one of the following** | | 50 | 2 | 2 | 0 | 0 | 2 | 30% | 70% |
| | | SOE010316C2002 | Institutions, Systems and Structures (Elementary Stage) | | | | | | | | |
| | | SOE010317C2002 | Institutions, Systems and Structures (Secondary Stage | | | | | | | | |
| 19 | 2 | **Any one of the following** | | 50 | 2 | 2 | 0 | 0 | 2 | 30% | 70% |
| | | SOE010318C2002 | Stage Specific Status, Issues and Concerns (Elementary Stage) | | | | | | | | |
| | | SOE010319C2002 | Stage Specific Status, Issues and Concerns (Secondary Stage) | | | | | | | | |
| 20 | 2 | **Any one of the following** | | 50 | 2 | 2 | 0 | 0 | 2 | 30% | 70% |
| | | SOE010320C2002 | Practice Relating to Curriculum, Pedagogy and Assessment( Elementary Stage) ( Elementary Stage) | | | | | | | | |
| | | SOE010321C2002 | Practice Relating to Curriculum, Pedagogy and Assessment (Secondary Stage) | | | | | | | | |
| 21 | 2 | SOE010322C2002 | Environmental Education | 50 | 2 | 2 | 0 | 0 | 2 | 30% | 70% |
| 22 | 4 | SOE010323C0044 | Internship in Specialized Area | 100 | 0 | 0 | 4 | 8 | 8 | 100% | |
| 23 | 2 | SOE010324C0022 | Dissertation Related Work | 50 | 0 | 0 | 2 | 4 | 4 | 100% | |
| Total | 22 | | | 550 | 14 | 14 | 08 | 16 | 30 | | |

1 credit Theory/ Tutorial/ Practicum=16 hours in a semester ; 1 credit practical=32 hours in a semester; 1 credit=25 Marks
Viva-Voce exam for course 22& 23 will be conducted by the external examiner at the end of the semester and weightage will be 40% external & 60% Internal.

## M. Ed. Semester- IV

| S. No. | Course Credit | Course Code | Paper Title | Total Marks | Credits (Theory/ Tutorial/ Practicum) | Practical | Class Teaching / Field Based Activity Hours per week | Internal Assessment Weightage | External Assessment Weightage |
|---|---|---|---|---|---|---|---|---|---|
| 24 | 4 | SOE010425C3014 | Recent Trends in Teacher Education | 100 | 4 | 0 | 4 | 30% | 70% |
| 25 | 4 | SOE010426DCEC3014 - SOE010429DCEC3014 | Elective Course-I | 100 | 4 | 0 | 4 | 30% | 70% |
| 26 | 4 | **Specialization of course (Elective-II)** | | 100 | 4 | 0 | 4 | 30% | 70% |
| | | SOE010430DCEC3014 | Educational Policy, Economics and Planning at Elementary Level | | | | | | |
| | | SOE010431DCEC3014 | Educational Policy, Economics and Planning at Secondary Level | | | | | | |
| 27 | 4 | **Specialization of course (Elective-III)** | | 100 | 4 | 0 | 4 | 30% | 70% |
| | | SOE010432DCEC3014 | Educational Management, Administration & Leadership at Elementary Level | | | | | | |
| | | SOE010433DCEC3014 | Educational Management, Administration & Leadership at Secondary Level | | | | | | |
| 28 | 4 | SOE010434DCEC3014-- SOE010437DCEC3014 | Elective Course-IV | 100 | 4 | 0 | 4 | 30% | 70% |
| 29 | 4 | SOE010438C3014 | Dissertation | 100 | 0 | 4 | 8 | 60% | 40% |
| Total | 24 | | | 600 | 20 | 4 | 28 | | |

**1 credit Theory/ Tutorial/ Practicum=16 hours in a semester ; 1 credit practical=32 hours in a semester; 1 credit=25 Marks**

- Viva-Voice exam for course 29 will be conducted by the external examiner at the end of the semester and weightage will be 40% external and 60% Internal.
- **General Elective Courses Offered to the other Department**
  - **Introduction to Counselling (4 Credits)**

## List of Specialization Course- Elective-I

| Sr. No. | Course Code | Paper Title |
|---|---|---|
| 1 | SOE010426DCEC3014 | Educational Technology |
| 2 | SOE010427DCEC3014 | Education of the Disadvantaged Groups |
| 3 | SOE010428DCEC3014 | Personality Development and Communication Skills |
| 4 | SOE010429DCEC3014 | Educational Measurement and Evaluation |

## List of Elective Course-IV

| Sr. No. | Course Code | Paper Title |
|---|---|---|
| 1 | SOE010434DCEC3014 | Value Education |
| 2 | SOE010435DCEC3014 | Distance and Open Learning |
| 3 | SOE010436DCEC3014 | Comparative Education |
| 4 | SOE010437DCEC3014 | Guidance and Counselling |

## List of General Elective Course (Offered to Other Department)

| Sr. No. | Semester | Course Code | Paper Title |
|---|---|---|---|
| 1 | Forth | SOE010449GEC3014 | Introduction to Counselling |

# Syllabus -M.Ed.

# Semester-IV

| Year | II | COURSE CODE:SOE010425C3014 | Credit | 4 |
|---|---|---|---|---|
| Semester | IV | RECENT TRENDS IN TEACHER EDUCATION | Marks | 100(Theory: 70 + Internal: 30) |

**Objectives :**

**On the completion of this course the students will -**

- be acquainted with various policies on teacher education and their implications.
- familiarized with the concept of professional competencies and ways to develop it.
- discuss and appreciate various issues related to teacher education
- identify gaps in research on teachers and teacher education
- appreciate the need and importance of in-service teacher education for professional development of teachers
- identify and discuss the current problems in the field of teacher education.

| Teaching Scheme (session)* | | | | Total (L+T+P) | Examination Scheme | | |
|---|---|---|---|---|---|---|---|
| Unit | Lecture (L) | Tutorial (T) | Practicum (P) | | Internal Assessment | External Assessment | Total Marks |
| I | 12 | 4 | 0 | 16 | 30 Marks | 70 Marks | 100 |
| II | 12 | 2 | 1 | 15 | | | |
| III | 12 | 3 | 2 | 17 | | | |
| IV | 12 | 3 | 1 | 16 | | | |
| Total | 48 | 12 | 04 | 64 | 30 | 70 | 100 |

**Course Content / Syllabus**

**Unit -I** — **Historical overview of Teacher Education**

- **Development of Teacher Education Pre-Independence:** Wood Dispatch (1854), Hunter Commission (1882), Sadlar Commission (1917-19) and Sargent Report (1944).
- **Development of Teacher Education** Post-Independence: Kothari Commission (1964-66). National Commission on Teachers (1983-85). NPE (1986) & POA (1992). NCFTE (2009). NCTE Regulations (2014) and Proposed draft of New Education Policy (2016)

**Unit -2** — **Initiatives for Professional Development of Teachers**

- **Policies and Programmes :** DPEP, SSA, RMSA, RUSA, and SAMAGRA
- **Digital Initiatives:**
  -INSET Concept, Modes and Importance
  -MOOCs, SWAYAM, SWAYAM Prabha
  -e-Pathshala, e-PG Pathshala, NROER
  -Faculty Development through online programmes

| | |
|---|---|
| **Unit –3** | **Teacher Competency and Accountability** |
| | • Teaching as a profession and Teacher as a reflective practitioner<br>• Professional ethics for teacher educators<br>• Competency based teacher education and Core competencies of teacher educators<br>• Roles and accountability of teacher educators and characteristics of effective teacher educators<br>• Role of NCTE & NAAC in the context of recognition, assessment and accreditation of teacher education institutions |
| **Unit –4** | **Emerging Issues in Teacher Education** |
| | • Maintaining standards in teacher education: Admission policies and procedures, recruitment of teacher educators and service conditions of teacher educators.<br>• Innovative practices/approaches in teacher education: Constructivist, ICT based approach, Integrated approach– School centered teacher education and Teacher centered approach to community development.<br>-System approach to teacher education.<br>• Quality concerns in teacher education<br>• Research priorities in teacher education |
| **Transactional Strategies** | The course would be transacted through participatory approach including lecture cum group discussion; self-study, seminar/presentations by students etc. |

**Evaluation strategies:**

Identify gaps in research on teacher education, design a program for teachers' professional development, organize a workshop on teacher's personality development and communication skills

| S. No. | Activity | Mode | Weightage of Marks |
|---|---|---|---|
| 1 | Two Sessional tests will be conducted (Better one will be considered) | Test | 10 |
| 2 | Preparation of an assignment on various topics and it is followed by presentation in the classroom (Group activity) & Practicum | Assignment & Presentation (PPT) | 05+10 |
| 3 | Percentage of attendance | | 05 |
| **Total Marks** | | | **30** |

**Suggested Readings:**


- Arora, G.L. (2002). *Teachers and their teaching*. Delhi: Ravi Books.
- Chaurasia G. (2000) *Teacher education and professional organizations*. Delhi: Authors Press
- Chauhan, S.S. (2018) *Professional ethics and accountability in education*. New Delhi: APH Publications
- Day, C. & J. Sachs, J. (2004) *International handbook on the continuing professional development of teachers*. Maidenhead: Brinks Open University Press
- Dillon J. & Maguire, M. (1997). *Becoming a teacher: Issues in secondary teaching*. Buckingham: Open University Press.
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- Misra, K.S. (1993). *Teachers and their education*. Ambala Cantt.: The Associated Publishers.
- Muhammad Miyan (2004). *Professionalization of teacher education*. New Delhi. Mittal Publications.
- Murray, Frank B. (1996). *Teacher educator's handbook. Building a base for preparation of teachers*. San Francisco: Jossey-Bass Publishers.
- Sen.S (2018). *Teachers in 21st century characteristics and role performance*. New Delhi: APH Publishing House
- National Council for Teacher Education (1998). NCTE Document. New Delhi: Member Secretary, NCTE.
- NCTE. (1998). *Policy perspective in teacher education-Critique and documentation*. New Delhi: NCTE.
- Reimers. E.V. (2003). *Teacher professional development: An international review of the literature*. UNESCO Paris: IIEP.
- Siddiqui. M.A. (1993). *In-service education of teachers*. New Delhi: NCERT.
- Wasnik (2018). *Skilling training: A complete guide for trainers and learners*. New Delhi: APH Publications

## List of Specialization Course- Elective-I

| Sr. No. | Course Code | Paper Title |
|---|---|---|
| 1 | SOE010426DCEC3014 | Educational Technology |
| 2 | SOE010427DCEC3014 | Education of the Disadvantaged Groups |
| 3 | SOE010428DCEC3014 | Teaching Proficiency |
| 4 | SOE010429DCEC3014 | Measurement and Evaluation |

| Year | II | COURSE CODE:SOE010426DCEC3014<br>EDUCATIONAL TECHNOLOGY | Credit | 4 |
|---|---|---|---|---|
| Semester | IV | | Marks | 100 (Theory: 70, Internal: 30) |

**Objectives**

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

- Explain the nature, forms and historical development of educational technology.
- Illustrate the emerging trends in Educational technology at National and International level.
- Understand the concept, nature, modes, and models of communication.
- Understand the procedure of formulation of teaching/instructional objectives in behavioural terms.
- Explain the concept, principles, styles and development of programmed learning.
- Illustrate the various techniques of modification of teaching behavior.
- Describe significance and stages of development of Instructional Design.
- Describe concepts and applications of CAL, CML, & CSCL.
- Elaborate the significance, applications and current trends in educational technology.
- Understand the issues covering to E-Learning, M-Learning, Blended learning, and Virtual Learning Communities.
- Describe the functions of various teaching resource centres.

| | Teaching Scheme (session)* | | | Total (L+T+P) | Examination Scheme | | |
|---|---|---|---|---|---|---|---|
| Unit | Lecture (L) | Tutorial (T) | Practicum (P) | | Internal Assessment | External Assessment | Total Marks |
| I | 12 | 4 | 0 | 16 | 30 | 70 | 100 |
| II | 12 | 2 | 1 | 15 | | | |
| III | 12 | 3 | 2 | 17 | | | |
| IV | 12 | 3 | 1 | 16 | | | |
| Total | 48 | 12 | 04 | 64 | 30 | 70 | 100 |

**Course Content / Syllabus**

**Unit-1** **Educational Technology and Communication: An Overview**

- Educational Technology: Concept, nature, components (hardware & software), scope, forms,historical development and emerging trends in educational technology at National and International levels.
- System approach in educational technology and its characteristics.
- Instructional technology: Concept, significance and scope, difference between educational technology and instructional technology.
- Communication: Concept, nature, modes, models of communication, barriers and facilitators in the process of communication, characteristics of effective communication, and Communication through web(Audio and video

| | |
|---|---|
| | applications). |
| **Unit-2** | **Instructional Objectives, Design and Programmed Learning** |
| | • Teaching/Instructional Objectives: Concept, need, and importance.<br>• Bloom's taxonomy of instructional objectives and approaches in writing instructional objectives in behavioral terms-Robert Millar, Robert Mager& RCEM.<br>• Instructional Design: Concept, significance, process and stages of development of Instructional Design.<br>• Programmed learning: Concept, origin, principles, styles of programming- Linear, Branching and Mathetics, and steps of development of programmed learning material. |
| **Unit-3** | **Modalities of Teaching** |
| | • Teaching: Concept, variables, difference between teaching and instruction, conditioning and training.<br>• Stages of teaching (pre-active, interactive and post-active) and teaching at different level-memory, understanding and reflective.<br>• Models of Teaching: Concept, fundamental elements and different families of teaching models-Glaser's Basic Teaching , Bruner's Concept Attainment, Social Inquiry Model.<br>• Modification of Teaching Behaviour: Micro Teaching, Simulation, Flanders' Interaction Analysis System andOber's System of Teacher Interaction Analysis. |
| **Unit-4** | **Emerging Trends in Educational Technology** |
| | • ICT in Education: Concept, significance and applications of ICT tools in Education.<br>• Multi-Media approach and teleconferencing (audio, video and web conferencing): Concept, applications and limitations<br>• Web- Based Technology in Teaching and Learning: E-Learning, Web based learning, M-Learning, Blended learning, Virtual Learning Communities (VLCs), Social networking through Web 2.0. Web 3.0 and Web 4.0 technologies, applications of Blog and Webinar as web learning tools.<br>• Composition and functions of major institutions/resource centres of educational technology in India – CIET, EMMRC, IGNOU, AVRC, Consortium for Educational Communication (CEC- UGC).<br>• Recent Digital Initiatives in India- e-pathshala,e- PG pathshala, MOOCs, SWAYAM, Open Educational Resources (OERs) etc. |
| **Transactional Strategies** | Lecture-cum- demonstration and hands on experiences on the production of audio-visual material; observation of various modes of training programmes by the different organizations / institutions and analyzing the different instructional designs. |

**Internal Assessment Strategies :**

**A total of thirty marks have been allotted under Internal Assessment. The nature of the activity, mode and weightage of marks are as follows.**

| S. No. | Activity | Mode | Weightage of Marks |
|---|---|---|---|
| 1 | Two Sessional tests will be conducted (Better one will be considered) | Test | 10 |
| 2 | Preparation of an assignment on various topics and it is followed by presentation in the classroom (Group activity) & Practicum | Assignment & Presentation (PPT) | 05+10 |
| 3 | Percentage of attendance | | 05 |
| **Total Marks** | | | **30** |

**Suggested Readings:**


- Adam, D M. (1985). *Computers and teacher training: A practical guide*. New York: Haworth Press
- Ahuja, M. (2007). *Mastery learning- A practical approach*. Meerut: Vivek Publishers.
- Behera. S.C. (1991). *Educational television programmes*. New Delhi: Deep and Deep Publications.
- Bhushan. A & Ahuja, M (1992) *Educational technology*. Meerut: Vikas Publication.
- Bloom. B.S. (1972). *Taxonomy of educational objectives: A hand book- I (cognitive domain)*. New York: David Mokeay Campo.
- Das. R.C. (1993). *Educational technology– A basic text*. New Delhi: Sterling Publishers Pvt. Ltd.
- Flanders. Ned A. (1978) *Analyzing teacher behavior*. London: Addison Wesley Publishing Co.
- Goel, S. (2019). *ICT waves in education: challenges for 21st century teachers*. New Delhi; Atlantic publishers
- Haas. K.B. and Packer. H.Q. (1990). *Preparation and use of audio visual aids*. New York: Prentice Hall.
- Jena. S.S. (2018). *ICT in Education*. New Delhi: Shipra Publication.
- Joyce, B Weil. M. & Showers, B (1985). *Models of Teaching*. New Delhi: Prentice Hall of India Pvt. Ltd.
- Kumar. K.L. (2008). *Educational technology*. New Delhi: New Age International Pvt. Ltd. Publishers.
- Kumar. N. and Chandiram. J. (1967). *Educational television in India*. New Delhi: Arya Book Depot.
- Mohanty. J. (2007) *Modern trends in educational technology*. Hyderabad: Neelkamal Publications.
- Mukhopadhyay. M. (1990). *Educational technology challenging issues*. New Delhi: Sterling Publishers Pvt. Ltd.
- Mukhopadhyay. M. (1990). *Educational technology*. New Delhi: Shipra Publication.
- Narang. V.K. (2015). *Modern trends in educational technology*. New Delhi: Astha Publishers
- Pandey, S. (2018). A textbook of educational technology. New Delhi: Pearson
- Ray, P.K.S. (2012) *Educational technology*. Delhi: Dominant Publishers.
- Roy. R. (2011) *Educational technology in changing society*. Delhi: Shipra Publication

| Year | II | COURSE CODE:SOE010427DCEC3014<br>EDUCATION OF THE DISADVANTAGED GROUPS | Credit | 4 |
|---|---|---|---|---|
| Semester | IV | | Marks | 100 (Theory: 70, Internal: 30) |

**Objectives**

After the completion of this course, the students will be able to

- understand the policy perspectives related to education of socially disadvantaged section in India,
- analyze the status of education of the socially disadvantaged children in the country,
- develop knowledge and skill to address social group inequality in school and, society,
- understand the schemes and programmes of education of socially disadvantaged group,
- identify research priorities and conduct researches in the area of education of socially disadvantaged groups.

| Teaching Scheme (session)* | | | | Total (L+T+P) | Examination Scheme | | |
|---|---|---|---|---|---|---|---|
| Unit | Lecture (L) | Tutorial (T) | Practicum (P) | | Internal Assessment | External Assessment | Total Marks |
| I | 12 | 4 | 0 | 16 | 30 | 70 | 100 |
| II | 12 | 2 | 1 | 15 | | | |
| III | 12 | 3 | 2 | 17 | | | |
| IV | 12 | 3 | 1 | 16 | | | |
| **Total** | **48** | **12** | **04** | **64** | **30** | **70** | **100** |

**Course Content / Syllabus**

**Unit-I** — **Conceptual Understating of Education of the Disadvantaged Groups**

- Disadvantaged Sections of India: Scheduled Castes, Scheduled Tribes, Educationally backward minorities, girls, children from rural and slum children.
- Constitutional Provisions for social group equity and education of socially disadvantaged sections of India
- National Policy on Education (1986), POA (1992), and National Curriculum Framework, 2005.
- International initiatives: Dakar Framework of Action (2000) and Millennium Development Goals (2000).

**Unit-2** — **Status of School Education of Disadvantaged Section in India**

- Status of enrolment at elementary and secondary stage with reference to social group equity, different access in habituations, class, caste, tribe and other disadvantages groups.

| | |
|---|---|
| | • Achievement of disadvantages children.<br>• Education of gifted and underachievers of disadvantaged group<br>• Remedial measures for disadvantaged section of society |
| **Unit-3** | **Problems in education of disadvantaged section and addressing inequality** |
| | • Problems in education of socially disadvantaged children.<br>• Multicultural education, multi-grade teaching in rural context.<br>• Organization and management of school to address socio-cultural diversity, bias in textbooks, hidden curriculum (teacher attitude, expectations).<br>• Teaching learning process and support materials, addressing language issues, curriculum and curricular activities for meeting diverse needs of children- socio-cultural and linguistic. |
| **Unit-4** | **Research priorities in the area of education of disadvantaged section** |
| | • Evaluation of centrally sponsored schemes of education of SCs, STs, girls and Minorities.<br>• Status study of education of SCs, STs, girls, and Minorities and other marginalized groups.<br>• Study of teaching learning practices and social inclusion.<br>• Case studies on innovative institutional practices-NVS, KGVBs, Madrassas etc. |
| **Transactional Strategies** | Discussions, debates, research trends analysis, case studies |

**Internal Assessment Strategies :**

**A total of thirty marks have been allotted under Internal Assessment. The nature of the activity, mode and weightage of marks are as follows.**

| S. No. | Activity | Mode | Weightage of Marks |
|---|---|---|---|
| 1 | Two Sessional tests will be conducted (Better one will be considered) | Test | 10 |
| 2 | Preparation of an assignment on various topics and it is followed by presentation in the classroom (Group activity) & Practicum | Assignment & Presentation (PPT) | 05–10 |
| 3 | Percentage of attendance | | 05 |
| | **Total Marks** | | **30** |

**Practicum:**

- Preparation of status report on education (elementary/secondary) of socially disadvantaged groups in a district/state region.
- Evaluation of text books from the social group equality perspective.



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- Critical analysis of NCF. 2005 (Focus group report).
- Field visit to residential/ ashram school's and minorities institutions and preparation of report.
- Identification of research topic in the area of education of socially disadvantaged sections and preparation of proposals.
- Documentation/preparation of report on institutions/school practicing innovations.
- Analysis of status report on girls' education-access, enrolment etc from selected educational statistics (MHRD), Report cards (NCEPA) and All India Survey Report (NCERT).
- Evaluation/Analysis of school textbooks from gender perspective.
- Visit to state Project office/DPO, discussion with members of girls' education cell and preparation of report

**Suggested Readings:**


- Bank, B.J. (2007) *Gender and education: An encyclopedia*. Westport, London: Praeger.
- Bhatt, B.D. & Sharma, S.R. (1992). *Women's education and social development*. Delhi: Kanishka
- Fredman, S. (2018). *Human rights and equality in education, comparative perspectives on right to education of minorities and disadvantaged groups*. Germany: Lambert publications.
- Government of India (1986). *National policy on education*. New Delhi: Department of Education.
- Government of India (1992). *Programme of action*, New Delhi: MHRD, Department of Education.
- Mehrotra, S. (2006). Child malnutrition and gender discrimination in south Asia. *Economics and political weekly*.
- NCERT (2005): *National curriculum framework*. New Delhi: NCERT.
- NCERT (2006). *National focus group report on education of SC's and ST's*. New Delhi: NCERT.
- Ramchandran, V. (1998). *Girls and women education, policies and implementation mechanism*. Case study: India. Bangkok, UNESCO.
- Scot Danforth & Terry J.S. (2005). *Engaging Troubling Students-A Constructivist Approach*.
- Sharma, M.C. & Sharma, A.K. (2003). *Discrimination based on sex, caste, religion and disability: Addressing through educational interventions; A handbook for sensitizing teacher and teacher educators*. New Delhi: NCTE & NHRC.
- ShehVimal P (1982). The *educational problems of scheduled caste and scheduled tribe school and college students in India*
- Subramanyam, R. (2003): Gender equality in education: Definitions and measurements. *International Journal of Educational Development*.
- Thamasseri, I. (2018). *Elementary education of socially disadvantaged groups*. Germany: Lambert Publications

| Year | II | COURSE CODE:SOE010428DCEC3014<br>PROFESSIONAL DEVELOPMENT AND COMMUNICATION SKILLS | Credit | 4 |
|---|---|---|---|---|
| Semester | IV | | Marks | 100 (Theory: 70, Internal: 30) |

**Objectives**

After the completion of this course, the students will-

- practice all communication skills
- learn the art of effective communication
- understand the 7C'S of effective communication
- understand the 4C'S of effective teaching
- be aware about the various techniques of stress management

| Teaching Scheme (session)* | | | | Total (L+T+P) | Examination Scheme | | |
|---|---|---|---|---|---|---|---|
| Unit | Lecture (L) | Tutorial (T) | Practicum (P) | | Internal Assessment | External Assessment | Total Marks |
| I | 12 | 4 | 0 | 16 | 30 | 70 | 100 |
| II | 12 | 2 | 1 | 15 | | | |
| III | 12 | 3 | 2 | 17 | | | |
| IV | 12 | 3 | 1 | 16 | | | |
| Total | 48 | 12 | 04 | 64 | 30 | 70 | 100 |

**Course Content / Syllabus**

**Unit-1** **Communication Skills**

- Listening
- Speaking
- Reading
- Presenting
- Writing

**Unit-2** **Art of Communication**

- Importance of Effective Communication
- 7Cs of Effective Communication
- Verbal and Non-verbal Communication

| | |
|---|---|
| | • Group Discussion<br>• Body language and Gestures<br>• Do's and Don't |
| **Unit-3** | **Personality Development** |
| | • Development of Self: Physical development, Spiritual development, Emotional development, Social development, Moral Development<br>• Etiquettes<br>• Time Management<br>• Basic Personality Traits: Values, Beliefs, Interactions, Experience and Environmental Influence<br>• Personality and Career choice (Teaching)<br>• Knowing your own personality strengths and weaknesses |
| **Unit-4** | **Development of Teaching Proficiency** |
| | • Ethics of teaching as a profession<br>• Mental Health and Adjustment<br>• Preparation for facing interviews and Mock Interview<br>• Simulation<br>• Managing Anxiety and and Conflict<br>• 4Cs of Effective Teaching: Choice, Critical Thinking, Creativity and Care |
| **Transactional Strategies** | Discussions, debates, research trends analysis, case studies |

**Internal Assessment Strategies :**

**A total of thirty marks have been allotted under Internal Assessment. The nature of the activity, mode and weightage of marks are as follows.**

| S. No. | Activity | Mode | Weightage of Marks |
|---|---|---|---|
| 1 | Two Sessional tests will be conducted (Better one will be considered) | Test | 10 |
| 2 | Preparation of an assignment on various topics and it is followed by presentation in the classroom (Group activity) & Practicum | Assignment & Presentation (PPT) | 05+10 |
| 3 | Percentage of attendance | | 05 |
| **Total Marks** | | | **30** |

**Practicum:**

- Case study of one student with adjustment problems
- Studying the personality characteristics of some successful individuals.
- Visiting institutes dealing with mental health problems of individuals, interaction with faculty and preparation of report
- Project work on identified themes.
- Visit to schools and classroom located in rural/urban/tribal contexts- exposure, observation, critical analysis of events and presentation before a small group

**Suggested Readings:**


- Atkinson, Richard C., et.al (1983). *Introduction to Psychology*. New York: Harcourt Brace Jovanovich Inc..
- Bandura, A. (1977). *Social learning theory*. Cliff. N. J: Prentice Hall.
- Bickhard, M.H. & Christopher, J.C. (1994). *The influence of early experience on human personality development. New ideas in psychology.*
- Bickhard, M.H. (1992). How does the environment affect the person? In L.T. Winegar, J. Valsiner (Eds.). *Children's development within social contexts: Meta theory and theory*. Erlbaum.
- Bourne, L.E. (1985). *Psychology: Its principles and meaning*. New York: Holt, Rinehart and Winston.
- Brown, R. (2000). Group *processes: Dynamics within and between groups*. (2nd Ed) New York: Blackwell Publishers.
- Cole, R. (1997). *Themoral intelligence of the children*. London: Bloomsbury.
- Cruickshank, W.M. (1980). *Psychology of exceptional children and youth*. N.J.: Prentice Hall.
- Dutt, Suresh (1997). *Society and education*. New Delhi: Anmol Publications.
- Erickson, E.H. (1968). *Identity, youth and crisis*. New York. W.W. Norton.
- Klausmeier, H. (1985). *Educational psychology*. New York: Harper and Row. Publication.
- Singh, K.K. (2018). The art of public speaking. New Delhi: APH Publishing House.
- Usha, R. (2018). *Life skills*. New Delhi: Sankalp Publications

| Year | II | COURSE CODE:SOE010429DCEC3014<br>MEASUREMENT & EVALUATION | Credit | 4 |
|---|---|---|---|---|
| Semester | IV | | Marks | 100 (Theory : 70, Internal : 30) |

**Objective**

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

- Understand the meaning, concept, trends and functions of measurement & evaluation.
- Relates educational objectives with evaluation.
- Plan, prepare, administer researcher made test.
- Use appropriate statistical concepts for analysis of test scores.
- Get acquainted with various examination reforms and alternative assessment.
- Get develop ability to apply theoretical knowledge gained through the course.
- Familiarize the students with theoretical background of educational measurement and evaluation
- Develop competencies in standardizing different types of measuring instrument.

| Teaching Scheme (session)* | | | | Total | Examination Scheme | | |
|---|---|---|---|---|---|---|---|
| Unit | Lecture (L) | Tutorial (T) | Practicum (P) | (L+T+P) | Internal Assessment | External Assessment | Total Marks |
| I | 12 | 4 | 0 | 16 | 30 | 70 | 100 |
| II | 12 | 2 | 1 | 15 | | | |
| III | 12 | 3 | 2 | 17 | | | |
| IV | 12 | 3 | 1 | 16 | | | |
| **Total** | **48** | **12** | **04** | **64** | **30** | **70** | **100** |

**Course Content / Syllabus**

**Unit–1** **Basics of Measurement and Evaluation**

- Concept, meaning, types and importance of measurement and evaluation.
- Differentiation between measurement and evaluation
- Role of measurement and evaluation in education
- Scales of measurement - ordinal, nominal, interval and ratio

**Unit-2** **Characteristics of Good Measuring Instruments**

- Validity: concept and types, factors affecting validity of test
- Reliability: concept and types, factors affecting reliability of test
- Objectivity: concept and techniques of maintain objectivity
- Norms: Meaning and significance, developmental-norms, age-norms, grade-norms

**Unit-3** **Test Construction & Standardization**



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| | |
|---|---|
| | • Norms and Criterion referenced test: Concept, difference and applications<br>• Teacher made and standardized test Concept, difference and applications.<br>• Steps involved in the standardization of an achievement test.<br>• Basic requirement in preparing a test, test specification and table of specifications, planning about constructing a test- blue print<br>• Preparation of norms for the final test, preparation of manual and reproductions of test. |
| **Unit-4** | **Recent trends in Evaluation** |
| | • Grading, marking and credit system.<br>• Alternative assessment strategies – rubric, performance based assessment.<br>• Question Bank.<br>• Continuous and comprehensive evaluation.<br>• Moderation and revaluation<br>• Online assessment tools. |
| **Transactional Strategies** | **Lectures, Assignments, Projects, Power Point Presentations, Survey, Test Construction.** |

**Internal Assessment Strategies :**

**A total of thirty marks have been allotted under Internal Assessment. The nature of the activity, mode and weightage of marks are as follows.**

| S. No. | Activity | Mode | Weightage of Marks |
|---|---|---|---|
| 1 | Two Sessional tests will be conducted (Better one will be considered) | Test | 10 |
| 2 | Preparation of an assignment on various topics and it is followed by presentation in the classroom (Group activity) & Practicum | Assignment & Presentation (PPT) | 05–10 |
| 3 | Percentage of attendance | | 05 |
| | **Total Marks** | | **30** |

**Practicum:**

1. Prepare an evaluation tool for any of the variables related to cognitive domain.
2. Prepare an evaluation tool for any of the variables related to affective domain.
3. Make a survey on problems in continuous and comprehensive Evaluation.

**Suggested Readings:**


- Allen, M.J. & Yen,W.M.(2004). *Introduction to measurement theory*. Illinois: Waveland Press, INC.
- Anastasi, A & Urbina, S.(1997). *Psychological testing*. (7th ed.). New Delhi: PHI Learning Pvt. Ltd.
- Anastasi, A. (1976) *Psychological testing* (4th ed.) New York: McMillan Publishing Company.
- Cronbach, L.J. (1970) *Essentials of psychological testing*. (3rd. ed.). New York: Harper & Row Publishers.
- Garrett, H. E. (2005) *Statistics in psychology and education*. New Delhi: Paragon International Publishers
- Guba,E.G. & Lincon,Y.S.(1989) *Fourth generation evaluation*. London:Sage Publications
- Guilford, J. P. & Fruchter, B. (1978) *Fundamental statistics in psychology and education*. New York: McGraw Hill.

- Guilford. J.P. (1979). *Psychometric methods*. New Delhi: Tata McGraw-Hill Publishing Company Ltd.
- Gupta. S. P. & Gupta. A. (2004). *Statistical methods*. New Delhi: Sultan Chand and Sons.
- Hinkle. D.E., Wiersma, W. & Jurs. S.G. (1994). *Applied statistics for behavioral sciences*. Boston: Houghton Mifflin Company
- Kanvaria, V. K. (2011). *Developing a standardized achievement test*. Germany: LAP.
- Kault. D. (2003). *Statistics with common sense*. Westport: Greenwood Press
- Mangal. S. K. (2009). *Statistics in psychology and education*. New Delhi: PHI Learning Pvt. Ltd.
- Marshall, H. & Addison. W. (1971). *Classroom test construction*. London: Publishing Company
- Murphy (2018). *Psychological testing: principle and applications*. New Delhi: Pearson Educations
- Nunnally,J.C. (1981). *Psychometric theory (2nd ed.)*. New Delhi: Tata McGraw-Hill Publishing Company Ltd.
- Popham. J.W. & Sirotnik.K.A. (1996). *Understanding statistics in education*. Illinois: F.E.Peacock Publishers,Inc.
- Rathore (2019). *Anusandhan vidhi evam takniki*. New Delhi: Sankalp prakashan.
- Robson, C. (1994). *Experiment, design and statistics in psychology (3rd ed.)*. England: Penguin Books.
- Sani, F. & Todman, J. (2006). *Experimental design and statistics for psychology: A first course*. MA, USA: Blackwell Publishing.
- Sethi, M.K. (2018). *Measurement and evaluation in education*. New Delhi: APH Publications
- Sharma. R. A. (2004). *Essentials of scientific behavioural research*. Meerut: Surya Publication.
- Singh, A. K. (1992). *Research methods in psychology, sociology and education*. Delhi: Motilal Banarasidas.
- Singh, A. K. (2001). *Test, measurements and research methods in behavioural sciences*. Delhi: Bharati Bhawan.
- Singh, K. (2007). *Quantitative social research methods*. Los Angeles: SAGE Publications.
- Thorndike, R. L. (1951). Reliability. In E. F. Lindquist (Ed), *Educational measurement*. Washington DC: American Council on Education.
- Wiersma, W. (1991). *Research methods in education*. Boston: Allyn and Bacon.

## (Elective-II)

## (At any one of the school stages--Elementary and Secondary)M.Ed. Semester-IV

| Year | II | COURSE CODE:SOE010430DCEC3014<br>EDUCATIONAL POLICY, ECONOMICS AND PLANNING AT ELEMENTARY LEVEL | | Credit | 4 |
|---|---|---|---|---|---|
| Semester | IV | | | Marks | 100 (Theory: 70, Internal: 30) |

**Objectives**

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

- know and appreciate the policies related to education in India at central and state level
- Understand the financing of education in India.
- Understand the concept and nature of educational planning.
- define education as an investment
- understand issues pertaining to the issues of quality at secondary level.
- critically analyze some of governmental plans and policies of education.

| Teaching Scheme (session)* | | | | Total (L+T+P) | Examination Scheme | | |
|---|---|---|---|---|---|---|---|
| Unit | Lecture (L) | Tutorial (T) | Practicum (P) | | Internal Assessment | External Assessment | Total Marks |
| I | 12 | 4 | 0 | 16 | 30 | 70 | 100 |
| II | 12 | 2 | 1 | 15 | | | |
| III | 12 | 3 | 2 | 17 | | | |
| IV | 12 | 3 | 1 | 16 | | | |
| **Total** | **48** | **12** | **04** | **64** | **30** | **70** | **100** |

**Course Content / Syllabus**

**Unit-1** — **Educational Policy at Elementary Level**

- Concept and Types of Educational Policy- State level Institutional ,Short –term, Long- term at Elementary Level
- Need and Importance of Educational Policy at Elementary Level
- Linkage between national Educational Policy and State Development Policy at Elementary Level
- Constitutional Provisions for Education and significance
- Government Initiatives: NPE (1986); POA (1992); DPEP (1994); SSA; RTE; LokJumbish Projects, ShikshaKarni Projects, Kasturba Gandhi ShikshaYojana, Sharde Hostels)

**Unit -2** — **Economics of Education**

- Meaning, Significance and Scope

| | |
|---|---|
| | • Education as Consumption<br>• Education as investment and Cost Analysis in Education<br>• Education and Economic Development<br>• Financing of Education in India: Center- State relationship, mobilization of resources<br>• Financial Contribution of community to school.<br>• Central and State Level Expansion on Elementary Education w.r.t. SC, ST, Minority Groups and Girls<br>• Models of development based on free market economies |
| **Unit -3** | **Educational Planning at Elementary Level** |
| | • Concept, needs and goals of Educational Planning<br>• Principles of Educational Planning.<br>• Approaches of Educational Planning<br>• Educational Planning in India since independence at elementary stage |
| **Unit- 4** | **Inspection, Supervision and Monitoring** |
| | • Monitoring and Supervision at Elementary Level<br>• Research and Evaluation of specific schemes like Mid-Day Meals, establishments of Village Education Committee and different incentive schemes and achievement levels<br>• Quality concern at elementary Education and assessment of quality<br>• Factors affecting quality and literacy achievement |
| **Transactional Strategies** | Discussions, debates, analysis of plans and policies, suggestions for improvement |

**Internal Assessment Strategies :**

**A total of thirty marks have been allotted under Internal Assessment. The nature of the activity, mode and weightage of marks are as follows.**

| S. No. | Activity | Mode | Weightage of Marks |
|---|---|---|---|
| 1 | Two Sessional tests will be conducted (Better one will be considered) | Test | 10 |
| 2 | Preparation of an assignment on various topics and it is followed by presentation in the classroom (Group activity) & Practicum | Assignment & Presentation (PPT) | 05+10 |
| 3 | Percentage of attendance | | 05 |
| **Total Marks** | | | **30** |

**Practicum :**

- Preparation of research design on a theme, discipline and RTE act. 2009
- Visit a school for reporting on access, and enrolment/ retentions of girl students and give suggestions for improvement.

- Critical Analysis of Research Studies on programs and policies related to elementary education (Survey a Govt school nearby and Prepare of report on critically analyze the SSA and Mid May Meal programme)
- Any other assignment/ project given by the Institute.
- Annual Status of Education Report (ASER); Achievement surveys; PROBE; Pratichi Report on Education; Global Monitoring; Report of UNESCO

**Suggested Readings:**


- Althusser, L. (1971). Ideology and ideological state apparatuses. in L. Althusser (eds). *Lenin and philosophy and other essays*. London. New Left Review.
- Apple, M (2004). *Ideology and curriculum*. New York: Routledge Falmer.
- Banerjee, S. Cole, E. Duflo and L. Linden (2003). *Improving the quality of education in India: Evidence from three randomized experiments*. NBER mimeo.
- Becker, Gary (1993) Nobel Lecture: The Economic Way of Looking at Behavior. *Journal of Political Economy* 101, pp 385-409.
- Becker, Gary S. (1964). Human capital (eds).*Investment in Human Capital. Effects on Earning*. NBER: New York.
- Belfield, Clive. (2000). *Economic principles for education*. Edward Elgar.
- Blaug, Mark. (1970). Where are we now in Economics of Education?. *Economics of Education Review*.
- Blaug, Mark. (1972). *An introduction to economics of education*. London: Penguin.
- Caplin, B (2018). *The case against education: why education is waste of time and money*. USA: Princeton university press
- Chattopadhyay, S (2012) .*Education and Economics*. London: Oxford University Press.
- Clarke, S. (2005). The neoliberal theory of society. In A. Saad-Filho & D. Johnston (eds.) *Neoliberalism: A Critical Reader*. Ann Arbour, MI: Pluto Press. 50-59.
- Coombs, P.H. (1969). *What is Educational Planning?*. Paris: International Institute of Educational Planning (IIEP).
- Pereeti, R (2018). *Teachers, teaching and reforms: perspectives on reforms to improve educational outcomes*. India: Routledge.
- Giroux, H. (2005). *The terror of neoliberalism: cultural politics and the promise of democracy*. Boulder: Paradigm Publishers.
- H. Levin.(1987) Education as a Public and Private Good. *Journal of Policy Analysis and Management*, Summer.
- Harvey, D. (2005). *A brief history of neoliberalism*. New York: Oxford University Press.
- Hayek, F. A. (1979). *Law, legislation and liberty: a new statement of the liberal principles and political economy. the political order of a free people*.(3rd ed.).. London: Routledge
- Naik, J.P.(1975) *Equality, quality and quantit. The elusive triangle in Indian education*. Bombay:Allied.
- Oreopoulos, P.,&Kjell S. (2011). Priceless: the non-pecuniary benefits of schooling. *Journal of Economic Perspectives* 25(1), 159-184.
- Padmanabhan,C B.(1986). *Economics of Educational planning in India*. New Delhi: Arya Book Depot
- Palley, T.I. (2005). From Keynesianism to Neoliberalism: shifting paradigms in economics.' in A. Saad-Filho & D. Johnston (eds..) *Neoliberalism. A critical Reader*. Ann Arbour, MI: Pluto Press
- Parkash S. (1999). *Educational planning*. New Delhi: Gyan Publishing House
- Prakash, V. &K. B. (2008) *Perspectives on Education and Development*. Delhi: NUEPA.
- Psacharapoulos, George. (1996). *The profitability of investment in education: Concepts and methods. human development and operations policy*, working Paper No. 15280. Washington. DC: The World Bank
- Psacharopoulous, G. (1985). *Planning of education. Where do we stand?*. Washington: World Bank
- Saad-Filho, A. & D. Johnston. (eds.) (2005) *Neoliberalism. A critical reader*. Ann Arbour, MI: Pluto Press.
- Schultz, T.W. (1961) Investment in Human Capital. *American Economic Review*
- Sen, Amartya and Dreze. (1996) *India: Economic development and social opportunity*. Oxford: University Press
- Tilak, Jandhyala B. G. (2002). Education and Poverty. *Journal of Human Development (New York, UNDP)*. 3 (2). 191-207.
- Tilak, Jandhyala B.G. (2006) Economics of Human Capital in India. *Indian Economic Journal*, 3(20).
- Tilak, Jandhyala B.G. (2008). "Education, Growth and Development, Keynote Address" 91st I.A Annual Conference 705 (19).

| Year | II | COURSE CODE:SOE010431DCEC3014<br>EDUCATIONAL POLICY, ECONOMICS AND PLANNING (SECONDARY LEVEL) | Credit | 4 |
|---|---|---|---|---|
| Semester | IV | | Marks | 100 (Theory: 70, Internal: 30) |

**Objectives**

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

- know and appreciate the policies related to education in India at central and state level
- Understand the financing of education in India.
- Understand the concept and nature of educational planning.
- define education as an investment
- understand issues pertaining to the issues of quality at secondary level
- critically analyze some of governmental plans and policies of educationanalyze some of governmental plans and policies of education

| Teaching Scheme (session)* | | | | Total (L+T+P) | Examination Scheme | | |
|---|---|---|---|---|---|---|---|
| Unit | Lecture (L) | Tutorial (T) | Practicum (P) | | Internal Assessment | External Assessment | Total Marks |
| I | 12 | 4 | 0 | 16 | 30 | 70 | 100 |
| II | 12 | 2 | 1 | 15 | | | |
| III | 12 | 3 | 2 | 17 | | | |
| IV | 12 | 3 | 1 | 16 | | | |
| **Total** | **48** | **12** | **04** | **64** | **30** | **70** | **100** |

**Course Content / Syllabus**

**Unit-I** — **Educational Policy at Secondary Level**

- Concept and Types of educational policies- National, State Level Institutional ,Short–Term and Long- Term at Secondary Level
- Need and Importance of Educational Policy at Secondary Level
- Linkage between Educational Policy and National Development Policy at Secondary Level
- Constitutional Provisions for Education and significance
- Govt initiatives (NPE, 1986; POS, 1992, DPEP, 1994; SSA; RMSA; RTE ,Lok-Jumbish Projects, Shiksha Karmi Projects, Kasturba Gandhi ShikshaYojana, Sharde Hostels)

**Unit-2** — **Economics of Education: Meaning, aims, scope and significance**

- Education as Consumption

| | |
|---|---|
| | • Education as Investment and Cost Analysis in Education<br>• Education and Economic Development<br>• Financing of Education in India: Center- National Relationship, Mobilization of Resources. |
| **Unit-3** | **Educational Planning at Secondary Level** |
| | • Concept, needs and goals of Educational Planning at Secondary Level<br>• Principles of Educational Planning at Secondary Level<br>• Approaches of Educational Planning at Secondary Level<br>• Educational planning in India since Independence at Secondary Level |
| **Unit-4** | **Planning Mechanisms and Five-Year Plan in Education & Educational Expenditure** |
| | • Main features of five year plans with special reference to education, impact of five year plans<br>• Perspective planning at central, state and local levels: concepts of macro, and micro level planning.<br>• Priorities to be given at central and state levels.<br>• Perspective plan for education in the 12th Five Year plan.<br>• District level planning: recent initiatives.<br>• Availability of educational statistics at central, state and district levels.<br>• Educational Expenditure and its Source of finance Government grants (central, state, local) Tuition fee, Taxes Endowment Donation and gifts, Foreign aids.<br>• School Budgetary and accounting procedure. Central grants, state grants and allocation of grants by U.G.C. Grant-in-aid policy in India and the states. Monitoring of expenditure control and utilization of funds, accounting and auditing. Central-State Relationship in Financing of Education<br>• Financial estimates by Tapas Mazumdar Committee (GoI, 1998) |
| **Transactional Strategies** | **Discussions, debates, analysis of plans and policies, suggestions for improvement** |
| **Tasks and Assignment: Any Two of the Following: (10 marks)**<br>• Estimation of opportunity cost on a sample of working school age children.<br>• Preparation of a blue-print for expenditure control in a school<br>• Preparation of a school budget | |

- Any other given assignment by the teacher educators

**Suggested Readings:**


- Althusser, L. (1971). Ideology and ideological state apparatuses, in L. Althusser (eds), *Lenin and philosophy and other essays*. London: New Left Review.
- Apple, M. (2004). *Ideology and curriculum*. New York: Routledge .
- Banerjee, S. Cole. E Duflo and L. Linden. (2003). *Improving the quality of education in India: Evidence from three randomized experiments*. NBER mimeo.
- Becker, Gary (1993). Nobel Lecture: The Economic Way of Looking at Behavior. *Journal of Political Economy* 101, pp. 385-400.
- Becker, Gary S. (1964). Human capital (eds).*Investment in Human Capital: Effects on Earning*. NBER: New York.
- Belfield. Clive. (2000). *Economic principles for education*. Edward Elgar.
- Blaug, Mark (1970). Where are we now in Economics of Education?. *Economics of Education Review*.
- Blaug, Mark. (1972). *An introduction to economics of education*. London: Penguin.
- Caplin. B. (2018) *The case against education: why education is waste of time and money*. USA: Princeton university press.
- Chattopadhyay. Saumen. (2012) .*Education and Economics*. London. Oxford University Press.
- Clarke. S. (2005). The neoliberal theory of society,in A. Saad-Filho & D. Johnston (eds.) *Neoliberalism – A Critical Reader*. Ann Arbour, MI: Pluto Press. 50-59.
- Coombs, P.H. (1969). *What is Educational Planning?*. Paris: International Institute of Educational Planning (IIEP).
- Fereeti, R. (2018). *Teachers, teaching and reforms: perspectives on reforms to improve educational outcomes*. India: Routledge.
- Giroux. H. (2005) *The terror of neoliberalism: cultural politics and the promise of democracy*. Boulder. Paradigm Publishers.
- H. Levin.(1987). Education as a Public and Private Good. *Journal of Policy Analysis and Management*. Summer
- Harvey, D. (2005). *A brief history of neoliberalism*. New York: Oxford University Press.
- Hayek, F. A. (1979). *Law, legislation and liberty: a new statement of the liberal principles and political economy; the political order of a free people*.(3rd ed.) London: Routledge.
- Naik. J.P.(1975).*Equality, quality and quantity: The elusive triangle in Indian education*. Bombay: Allied.
- Oreopoulos. P..& Kjell S. (2011) Priceless: the non-pecuniary benefits of schooling. *Journal of Economic Perspectives* 25(1) 159-184.
- Padmanabhan.C .B.(1986) *Economics of Educational planning in India*. New Delhi. Arya Book Depot.
- Palley. T.I. (2005). From Keynesianism to Neoliberalism: shifting paradigms in economics," in A. Saad-Filho & D. Johnston (eds.) *Neoliberalism: A*

*critical Reader*. Ann Arbour, MI: Pluto Press.

- Parkash S. (1999). *Educational planning*. New Delhi: Gyan Publishing House.
- Prakash, V. &K. B. (2008) *Perspectives on Education and Development*. Delhi: NUEPA.
- Psacharapoulos, George (1996). *Theprofitability of investment in education: Concepts and methods, human development and operations policy*, working Paper No. 15280. Washington, DC: The World Bank.
- Psacharopolous, G. (1985). *Planning of education: Where do we stand?*. Washington World Bank.
- Saad-Filho, A. & D. Johnston. (eds.) (2005). *Neoliberalism: A critical reader*. Ann Arbour, MI: Pluto Press.
- Schultz, T.W. (1961). Investment in Human Capital, *American Economic Review*.
- Sen, Amartya and Dreze (1996). *India: Economic development and social opportunity*. Oxford: University Press.
- Tilak, Jandhyala B. G. (2002). Education and Poverty. *Journal of Human Development (New York: UNDP)*,3 (2), 191-207.
- Tilak, Jandhyala B.G. (2006). Economics of Human Capital inIndia.*Indian Economic Journal*, 3(20).
- Tilak, Jandhyala B.G. (2008). "Education, Growth and Development, Keynote Address". 91st IEA Annual Conference 705 (19).

# (Elective-III)

## (At any one of the school stages–Elementary and Secondary) M.Ed. Semester-IV

| Year | II | COURSE CODE:SOE010432DCEC3014<br>EDUCATIONAL MANAGEMENT, ADMINISTRATION & LEADERSHIP AT ELEMENTARY LEVEL. | Credit | 4 |
|---|---|---|---|---|
| Semester | IV | | Marks | 100 (Theory: 70, Internal: 30) |

**Objectives**

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

- Know and understand the concepts of educational management, administration and leadership
- Understand various styles of leadership
- Develop some leadership qualities in themselves
- Understand educational administration in India at local, state and central level

| Teaching Scheme (session)* | | | | Total (L+T+P) | Examination Scheme | | |
|---|---|---|---|---|---|---|---|
| Unit | Lecture (L) | Tutorial (T) | Practicum (P) | | Internal Assessment | External Assessment | Total Marks |
| I | 12 | 4 | 0 | 16 | 30 | 70 | 100 |
| II | 12 | 2 | 1 | 15 | | | |
| III | 12 | 3 | 2 | 17 | | | |
| IV | 12 | 3 | 1 | 16 | | | |
| **Total** | **48** | **12** | **04** | **64** | **30** | **70** | **100** |

**Course Content / Syllabus**

**Unit- I** — **Educational Management & Educational Planning and Supervision**

- Concept, Needs, Objectives and Scope of Educational Management
- Approaches and Principles of Educational Management
- Concept of Educational Management Human Beings as inputs, Process & Product inputs
- Educational Manager Functions, Roles, Skills & Competencies
- Managerial Creativity, Managerial Ethics
- Role and functions of Headmaster/ Principal/ Teacher Basic functions of Administration, Planning, Organizing, Directing and Controlling in School Management & Administration

| | |
|---|---|
| | • Meaning, Nature and Approaches of Educational Planning<br>• Institutional Planning and Perspective Planning at Elementary Level<br>• Meaning , Nature and Scope of Educational Supervision<br>• Educational Supervision as Service Activity, Process, Functions, Planning, Organizing and Implementing Supervisory Programmes at Elementary Level |
| **Unit-2** | **Introduction to Educational Administration & Communication in Educational Management &Administration** |
| | • Concept, Scope, Principles of Educational Administration<br>• Educational Administration Approaches and Emerging Trends<br>• Development of Modern Concept of Educational Administration from 1900 to Present Day: Taylorism, Administration as a Process, Human Relations Approach to Administration.<br>• Types of Communication<br>• Methods and Devices of Communication<br>• Selection of Appropriate Communication Strategies<br>• Barriers of Communication |
| **Unit-3** | **Leadership in Education & Theories of Leadership** |
| | • Concept of Leadership, Leader and Manager,<br>• Leadership Traits and Skills<br>• Functions and Styles of Leadership<br>• Measurements of Leadership<br>• Approaches of Leadership Trait, Transformational, Transactional, Value-Based, Cultural, Psychodynamic, Charismatic, Community based and Social.<br>• Blake and Mouton's Managerial Grid, Fiedler's Contingency Model, Tridimensional Model<br>• Hersey and Blanchard's Situational Theory |
| **Unit-4** | **Educational Administrative Bodies in India at State & Local Level : Role & Functions** |
| | • State Bodies State Council of Educational Research & Training (SCERT),<br>• State Institute of Education Technology (SIET),<br>• District Institute of Education& Training (DIET),<br>• Institute of Advance Studies in Education(IASE)<br>• Local Bodies: Municipal Councils/Corporation, Zila Parishads, Panchayats. |
| **Transactional** | Lectures, field visits to various educational institutions, case studies, assignments, discussions |

| Strategies | |
|---|---|

**Internal Assessment Strategies :**

**A total of thirty marks have been allotted under Internal Assessment. The nature of the activity, mode and weightage of marks are as follows.**

| S. No. | Activity | Mode | Weightage of Marks |
|---|---|---|---|
| 1 | Two Sessional tests will be conducted (Better one will be considered) | Test | 10 |
| 2 | Preparation of an assignment on various topics and it is followed by presentation in the classroom (Group activity) & Practicum | Assignment & Presentation (PPT) | 05+10 |
| 3 | Percentage of attendance | | 05 |
| **Total Marks** | | | **30** |

**Practicum :**

- Compile articles from newspapers, magazines, and internet discussing present policies and operational strategies of central & state Govt. for Elementary Education Prepare a report of entire activity
- Review research on educational management or management of elementary schools
- Evaluation of management of SSA activities in a district.
- Collect data from relevant sources on student & teachers ratio at elementary level. Is it according to provison of RTE act? Prepare a report on it.
- Examine the effectiveness of any one programme run by central Govt for elementary students Present the report in a classroom seminar.
- Analyze quality & quantity of Mid-day meal in any rural school.

**Suggested Readings:**


- Altrichter, H. & Elliot, J.(2000). *Images of educational change. England*: Buckingham Open University.
- Bhattacharya. D.K. (2001) *Managing people*. New Delhi: Excel Books.
- Bush T., L. B. (2003). The *principles and practice of educational management*. (Eds.). New Delhi: Sage Publications.
- Bush. T. (2013). *Educational management, administration & leadership*. New Delhi: Sage Publications.
- Chauhan.S (2012). *Educational management*. New Delhi: Pearson Publication.
- Dawra, S. (2003) *Management thought*. New Delhi: Mohit Publication.
- Dhillon, S.S. (2019). *Educational administration: management and leadership*. New Delhi: Gyan Geeta Publications.
- Gopal. K. (2001). *Management of organizational change*. New Delhi: Response Books
- Lunenburg, F.C. & Orenstein, A.C. (2012).*Educational administration- Concepts & practices*. Canada, USA: Wadsworth, Cengage Learning Solutions.
- Luthans. F (2005). *Organisational behavior*. New York: McGraw-Hills Inc.
- McCaffery, P. (2004). *The higher education manager's handbook*. New York and Canada: Routledge
- Nair, S.R. (2004) *Organizational behaviour- Texts and cases*. Mumbai: Himalaya Publication.
- Nanda, S.R. (2009). *Educational administration*. New Delhi: APH Publishing Corporation Publishing House.
- Northouse, P. (2018). *Leadership theory and practice*. New Delhi: Sage Publications.

- Owens, R.C. (2001). *Organizational behaviour in education*, Boston: Allyn and Bacon.
- Prasad, A. (2007). *University education administration and the law*. New Delhi: Deep& Deep Publications.
- Punia,V. (2004). *Managerial skills in educational administration*. New Delhi: Deep& Deep Publications Pvt. Ltd.
- Rita, S. (2004). *Assessment and accreditation in higher education*. New Delhi: Association of Indian Universities.
- Sayeed, O. B. and Pareek, U. (2000). *Actualizing managerial roles*. New Delhi: Tata McGraw-Hill Publishing Company Limited.
- Sharma, R. A. (2009). *Educational administration &management*. Meerut: R Lal Book Depot.
- Sindhu, J.S. (2012). *Educational administration & management*. New Delhi: Pearson Publications
- Srivastav, A.K. (2009). *Educational administration policy, planning and survey*. New Delhi: Kunal Books.




| Year | II | COURSE CODE:SOE010433DCEC3014<br>EDUCATIONAL MANAGEMENT, ADMINISTRATION AND LEADERSHIP AT SECONDARY LEVEL | Credit | 4 |
|---|---|---|---|---|
| Semester | IV | | Marks | 100 (Theory: 70, Internal: 30) |

**Objectives**

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

- Know and understand the concepts of educational management, administration and leadership
- Understand various styles of leadership
- Develop some leadership qualities in themselves
- Understand educational administration in India at local, state and central level

| Teaching Scheme (session)* | | | | Total (L+T+P) | Examination Scheme | | |
|---|---|---|---|---|---|---|---|
| Unit | Lecture (L) | Tutorial (T) | Practicum (P) | | Internal Assessment | External Assessment | Total Marks |
| I | 12 | 4 | 0 | 16 | 30 | 70 | 100 |
| II | 12 | 2 | 1 | 15 | | | |
| III | 12 | 3 | 2 | 17 | | | |
| IV | 12 | 3 | 1 | 16 | | | |
| **Total** | **48** | **12** | **04** | **64** | **30** | **70** | **100** |

Course Content / Syllabus

**Unit-I** — **Educational Management, Educational Planning & Supervision**

- Concept, Needs, Objectives & Scope of Educational Management
- Approaches and Principles of Educational Management
- Concept of Educational Management Human Beings as inputs, Process & Product inputs
- Educational Manager: Functions, Roles, Skills & Competencies
- Managerial Creativity, Managerial Ethics
- Role and functions of Headmaster/ Principal: Teacher: Basic functions of Administration, Planning, Organizing, Directing and Controlling in School Management and Administration
- Meaning, Nature and Approaches of Educational Planning
- Institutional Planning and Perspective Planning at secondary level



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| | |
|---|---|
| | • Meaning , Nature and Scope of Educational Supervision<br>• Educational Supervision as : Service Activity, Process, Functions, Planning, Organizing and Implementing Supervisory Programmes at secondary level. |
| **Unit-2** | **Introduction to Educational Administration & Communication in Educational Management and Administration** |
| | • Concept, Scope, Principles of Educational Administration<br>• Educational Administration Approaches and Emerging Trends<br>• Development of Modern Concept of Educational Administration from 1900 to Present Day: Taylorism, Administration as a Process, Human Relations Approach to Administration.<br>• Types of Communication<br>• Methods and Devices of Communication<br>• Selection of Appropriate Communication Strategies<br>• Barriers of Communication |
| **Unit-3** | **Leadership in Education & Theories of Leadership** |
| | • Concept of Leadership, Leader and Manager,<br>• Leadership Traits and Skills<br>• Functions and Styles of Leadership<br>• Measurements of Leadership<br>• Approaches of Leadership: Trait, Transformational, Transactional, Value-Based, Cultural, Psychodynamic, Charismatic, Community based and Social.<br>• Blake and Mouton's Managerial Grid, Fiedler's Contingency Model, Tridimensional Model<br>• Hersey and Blanchard's Situational Theory. |
| **Unit- 4** | **Educational Administrative Bodies in India at National Level: Role & Functions** |
| | • University Grant Commission (UGC)<br>• National Council of Educational Research and Training (NCERT)<br>• National University of Educational Planning and Administration (NUEPA)<br>• Ministry of Human Resource Development (MHRD)<br>• National Council for Teacher Education (NCTE)<br>• Central Advisory Board For Education (CABE) |

| | |
|---|---|
| **Transactional Strategies** | Lectures, field visits to various educational institutions, case studies, assignments, discussions |

**Internal Assessment Strategies :**

**A total of thirty marks have been allotted under Internal Assessment. The nature of the activity, mode and weightage of marks are as follows.**

| S. No. | Activity | Mode | Weightage of Marks |
|---|---|---|---|
| 1 | Two Sessional tests will be conducted (Better one will be considered) | Test | 10 |
| 2 | Preparation of an assignment on various topics and it is followed by presentation in the classroom (Group activity) & Practicum | Assignment & Presentation (PPT) | 05+10 |
| 3 | Percentage of attendance | | 05 |
| **Total Marks** | | | **30** |

**Practicum :**

- Compile articles from newspapers, magazines, and internet discussing present policies and operational strategies of central and state Govt. for secondary education. Prepare a report of entire activity.
- Review research on educational management or management of secondary schools which are used in other countries but not in India.
- Evaluation of management of SSA activities in a district.
- Collect data from relevant sources on student & teachers ratio for secondary level school of your district. Is it according to provision of RTE act? Prepare a report and send it to authorities.
- Examine the effectiveness of any one programme run by central Govt. for secondary students. Present the report in a classroom seminar

**Suggested Readings:**


- Altrichter, H. & Elliot, J. (2000). *Images of educational change*. England: Buckingham Open University
- Bhattacharya, D.K. (2001). *Managing people*. New Delhi: Excel Books.
- Bush T., L. B. (2003). The *principles and practice of educational management*. (Eds.). New Delhi: Sage Publications.
- Bush, T. (2013). *Educational management administration & leadership*. New Delhi: Sage Publications
- Chauhan, S (2012). *Educational management*.New Delhi: Pearson Publication
- Dhillon, S S (2019). *Educational administration: management and leadership*. New Delhi: Gyan Geeta Publications.
- Dawra, S. (2003). *Management thought*, New Delhi: Mohit Publication.
- Harigopal, K. (2001). *Management of organizational change*. New Delhi, Response Books.
- Lunenburg,F.C. & Orenstein, A.C. (2012).*Educational administration- Concept & practices*. Canada, USA: Wadsworth, Cengage Learning Solutions.
- Luthans, F. (2005). *Organizational behavior*. New York: McGraw-Hills Inc.
- McCaffery, P. (2004). *The higher education manager's handbook*. New York and Canada: Routledge.
- Nair, S R. (2004) *Organizational behaviour-Texts and cases*. Mumbai: Himalaya Publication
- Nagpal, S B. (2009). *Educational administration*. New Delhi: APH Publishing Corporation Publishing House.
- Northouse, P. (2018). *Leadership theory and practice*. New Delhi: Sage Publications.

- Owens, R.C. (2001). *Organizational behaviour in education*, Boston: Allyn and Bacon.
- Prasad, A. (2007). *University education administration and the law*. New Delhi: Deep & Deep Publications.
- Punia,V. (2004). *Managerial skills in educational administration*. New Delhi: Deep & Deep Publications Pvt. Ltd.
- Rita, S. (2004). *Assessment and accreditation in higher education*. New Delhi: Association of Indian Universities.
- Sayeed, O. B. and Pareek, U. (2000). *Actualizing managerial roles*. New Delhi: Tata McGraw-Hill Publishing Company Limited.
- Sharma, R. A. (2009). *Educational administration &management*. Meerut: R Lall Book Depot.
- Sindhu, I.S. (2012). *Educational administration & management*. New Delhi: Pearson Publications
- Srivastav, A.K. (2009). *Educational administration policy, planning and survey*. New Delhi: Kunal Books.

## List of Elective Course-IV

| Sr. No. | Course Code | Paper Title |
|---|---|---|
| 1 | SOE010434DCEC3014 | Value Education |
| 2 | SOE010435DCEC3014 | Distance and Open Learning |
| 3 | SOE010436DCEC3014 | Comparative Education |
| 4 | SOE010437DCEC3014 | Guidance and Counselling |

(Elective-IV)

(At any one of the school stages–Elementary and Secondary)M.Ed. Semester-IV

| Year | II | COURSE CODE:SOE010434DCEC3014<br>VALUE EDUCATION | Credit | 4 |
|---|---|---|---|---|
| Semester | IV | | Marks | 100 (Theory: 70, Internal: 30) |

**Objectives**

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

- Understand importance and need for value education
- Appreciate various activities organized by the schools to develop desirable values in the students
- Conduct various talks and programs for value education
- Gain knowledge of various models for value education
- Understand role of teachers for inculcation of values in the students

| Unit | Teaching Scheme (session)* | | | Total (L+T+P) | Examination Scheme | | |
|---|---|---|---|---|---|---|---|
| | Lecture (L) | Tutorial (T) | Practicum (P) | | Internal Assessment | External Assessment | Total Marks |
| I | 12 | 4 | 0 | 16 | 30 | 70 | 100 |
| II | 12 | 2 | 1 | 15 | | | |
| III | 12 | 3 | 2 | 17 | | | |
| IV | 12 | 3 | 1 | 16 | | | |
| **Total** | **48** | **12** | **04** | **64** | **30** | **70** | **100** |

**Course Content / Syllabus**

**Unit-1** **Value Education & Need**

- Concept of Values and Value Education; Historical Background of Value Education
- Aims and Objectives of Value Education
- Need, Importance and Role of Value Education in the present emerging Indian society
- Classification of Values

**Unit-2** **Theories & Model of Value Development**

- Theories of Value Development: Psycho-analytic. Learning theory – social learning Cognitive development , Piaget and Kohlberg

| | |
|---|---|
| | • Models of Value Development : Value Analysis, Rationale Building, Social Action , The Consideration Model |
| **Unit-3** | **Types of Values & Profession** |
| | • Constitutional or national values - Democracy, socialism, secularism, equality, justice, liberty, freedom and fraternity.<br>• Professional Values-Knowledge thirst, sincerity in profession, regularity, punctuality and faith.<br>• Religious Values - Tolerance, wisdom, character.<br>• Modernity vs. Value crisis, Issues and challenges<br>• Value orientation of Teacher education curricula in India |
| **Unit-4** | **Value & Character Building** |
| | • Concept of Morality and Moral Judgment<br>• Aspects of Moral Education – Liberal, Social, Religious, Psychological<br>• Development of Moral Character And Attitude<br>• Role of Media in developing values and morality |
| **Transactional Strategies** | Discussions, lectures, debates, workshops, conduct of various speeches and talks etc. |

**Internal Assessment Strategies :**

**A total of thirty marks have been allotted under Internal Assessment. The nature of the activity, mode and weightage of marks are as follows.**

| S. No. | Activity | Mode | Weightage of Marks |
|---|---|---|---|
| 1 | Two Sessional tests will be conducted (Better one will be considered) | Test | 10 |
| 2 | Preparation of an assignment on various topics and it is followed by presentation in the classroom (Group activity) & Practicum | Assignment & Presentation (PPT) | 05+10 |
| 3 | Percentage of attendance | | 05 |
| **Total Marks** | | | **30** |

**Practicum :**

- Organize any programme (Morning Assembly, Celebration of Important Days etc.) for school children for inculcating different values.
- Create a programme for awareness among the school/college students about value education.
- Study of the comparison of values among students of one urban school with one rural school.
- Making a project report on role of formal and informal agencies for inculcating values among children

**Selected Readings:**


- Guber, F.C.(1963). *Aspects of value*. Phildelphia: University of Pennsylvania Press.

- Guber. F.C (1963). *Aspects of value*. Philadelphia: University of Pennsylvania Press.
- Josta.H.R.(1991).*Spiritual values and education*. Ambala Cantt: Associated Publishers.
- Jamal, N (2018). *Baudhik evam naitik shiksha*. New Delhi DPS Publishers
- Kluckhohn, C.(1961). *The Study of Values*. In D.N Barett (ed), *value in America*. Norte Dame: University of Norte Dame Press.
- Kothari D.S. Education and Values, Report of the orientation course-cum-workshop on Education in Human Values. New Delhi.
- Malhotra P.L. *Education, Social Values and Social Work-the Task for the New Generation*, New Delhi. NCERT.
- Morris, C. (1956). *Varieties of human values*. Chicago: University of Chicago press.
- Mukerjee. R. K. (1969). *Social structure of values*. New Delhi: S. Chand and Co
- NCERT (1992). *Education in values*, New Delhi
- Rokeach, M. (1978). *The nature of human values*. New York: Jessy Brass
- Ruhela, S.P. (1986) *Human values and education*. New Delhi: Sterling Publications.
- Sprod, T. (1998). *Philosophical discussion in moral education, the community of ethical inquiry: Routledge International Studies in the Philosophy of Education*. New York: Routledge.
- Venkataiah. N. (1998). *Value Education*. Delhi: APH Publishing.

| Year | II | COURSE CODE:SOE010435DCEC3014<br>DISTANCE & OPEN LEARNING | Credit | 4 |
|---|---|---|---|---|
| Semester | IV | | Marks | 100 (Theory : 70, Internal : 30) |

**Objective**

To enable the pupil teachers to :

- understand the philosophy of open and distance learning
- understand the distance and open modes of learning
- differentiate different modes of learning.
- understand the need and importance of distance and open learning.
- understand the role of mass media and various other technologies in distance and open learning.
- understand the procedure of self-instructional material development and student support services for open and distance learning.
- develop the understanding of management of open and distance learning.
- know various evaluation techniques in distance education.

| Unit | Teaching Scheme (session)* | | | Total (L+T+P) | Examination Scheme | | |
|---|---|---|---|---|---|---|---|
| | Lecture (L) | Tutorial (T) | Practicum (P) | | Internal Assessment | External Assessment | Total Marks |
| I | 12 | 4 | 0 | 16 | 30 | 70 | 100 |
| II | 12 | 2 | 1 | 15 | | | |
| III | 12 | 3 | 2 | 17 | | | |
| IV | 12 | 3 | 1 | 16 | | | |
| **Total** | **48** | **12** | **04** | **64** | **30** | **70** | **100** |

**Course Content / Syllabus**

**Unit – I** — **Growth & Philosophy of Distance Education**

- Concept, meaning, nature of distance and open learning.
- Growth and philosophy of distance education and open learning – International and National.
- Need, importance, scope, advantages and limitations of distance and open learning.
- Correspondence and open education. Development, objectives and modes.
- Param Inter University: An Indian Perspective of open learning.

**Unit – II** — **Communication aspects of Distance & Open Learning**

- Communication Technology for Distance Education.

| | |
|---|---|
| | • Audio Technology, Video Technology, satellite based communication system, Mobile Technology.<br>• Role of Mass Media.<br>• Computer Technology. |
| **Unit – III** | **Instructional Process of Distance & Open Learning** |
| | • Research for distance education.<br>• Curriculum Development for distance education.<br>• Distance Education: Economic perspective.<br>• Staff training and Development in Distance Education, Professional Training in Distance Education. |
| **Unit – IV** | **Evaluation Procedure in Distance Education** |
| | • Learner Support Services.<br>• Management of Distance Education<br>• Recommendations of NPE (1986) and NKC (2005) regarding distance education and recent developments in Distance Education.<br>• Evaluation techniques in Distance Education.<br>• Comprehensive and continuous evaluation in Distance Education & Open Learning. |
| Transactional Strategies | **Web based learning, Lectures, Debates, Assignments, Projects, Power Point Presentations, and Demonstration.** |

**Internal Assessment Strategies :**

**A total of thirty marks have been allotted under Internal Assessment. The nature of the activity, mode and weightage of marks are as follows.**

| S. No. | Activity | Mode | Weightage of Marks |
|---|---|---|---|
| 1 | Two Sessional tests will be conducted (Better one will be considered) | Test | 10 |
| 2 | Preparation of an assignment on various topics and it is followed by presentation in the classroom (Group activity) & Practicum | Assignment & Presentation (PPT) | 05+10 |
| 3 | Percentage of attendance | | 05 |
| **Total Marks** | | | **30** |

**Practicum :**

- Review of a book on distance education.
- Assignment on the need and relevance of distance education system in India at elementary/secondary/higher levels.
- Review of CIET/UGC/IGNOU TV Programmes, and preparation of report.

**Suggested Readings:**


- Crompton H. (2018) *Mobile learning and higher education: challenges and context*. India: Routledge
- Criscito Pat (2004). *Barron's guide to distance learning*. London, Barron's E. Publisher.

- Garrison, D. R. (1989). *Understanding distance education framework for future*. Chapman and Hall, London: Routledge.
- Holmberg. B. (1985). *Status and structure of distance education* (2nd Ed.). Lector Publishing.
- IGNOU (1988) *Growth and philosophy of distance education*. (Block 1, 2 & 3). New Delhi: IGNOU.
- Mohanty, J. (2001). *Studies in distance education*. New Delhi: Deep & Deep Publication.
- Nandra, J.S. (2010): *Distance and open education*; Patiala: Century Publication.
- Pandey, U. (2017). Optimizing open and distance learning in higher education institutions. New Delhi. IPI Global
- Prasad D. Chandra (2007). *Distance education*. New Delhi: K.S.K. Publishers.
- Race, Phil (1994). *The open learning handbook*, Second Edition. London: Kogan Page.
- Rathore, H.C.S. (1993). *Management of distance education in India*. New Delhi: Ashish Publishing House.
- Sharma S. (2002). *Modern methods of lifelong learning and distance education*. Meerut: International Publishing House
- Sharma, R.A. (2008). *Distance Education*. Meerut: International Publishing House.

| Year | II | COURSE CODE:SOE010436DCEC3014<br>COMPARATIVE EDUCATION | Credit | 4 |
|---|---|---|---|---|
| Semester | IV | | Marks | 100 (Theory: 70, Internal: 30) |

**Objectives**

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

- acquaint the student with concept, scope, Need, History and development of Comparative Education.
- acquaint the student with the methods of Comparative Education
- study the Problems of Education in World perspective.
- understand the factors and forces and forces influencing practice of Education.
- create awareness and develop understanding of system of Education in developing and developed countries.
- develop the sense of international understanding.
- acquaint the students with the current trends and problems in world in world Education.

| Teaching Scheme (session)* | | | | Total | Examination Scheme | | |
|---|---|---|---|---|---|---|---|
| Unit | Lecture (L) | Tutorial (T) | Practicum (P) | (L+T+P) | Internal Assessment | External Assessment | Total Marks |
| I | 12 | 4 | 0 | 16 | 30 | 70 | 100 |
| II | 12 | 2 | 1 | 15 | | | |
| III | 12 | 3 | 2 | 17 | | | |
| IV | 12 | 3 | 1 | 16 | | | |
| **Total** | **48** | **12** | **04** | **64** | **30** | **70** | **100** |

**Course Content / Syllabus**

**Unit -1** — **Conceptual Understanding of Comparative Education & Historical Development**

- Concept, scope and aims of Comparative Education.
- Principles behind analysing educational system of different countries
- Historical development of comparative Education
- Approaches to Comparative Education: Historical, Philosophical, Sociological and Problem Approach
- Factors influencing Education system in any country

**Unit-2** — **Elementary Education and secondary Education (U.K., U.S.A. and India)**

- Salient Features of Pre-Primary Education in UK, USA and India
- Salient Features of Elementary Education in UK, USA and India
  -Aims, content, Methods of Instructions and Evaluation strategies



2023

<table>
<tr><td></td><td>-Concept of Universalization of Elementary Education in India and its implementation, SSA and DPEP<br>• Salient Features of Secondary Education in UK, USA and India<br>-Aims, Content, Methods of Instructions and Evaluation strategies<br>-RastriyaMadyamikSikhshaAbhiyan<br>• Educational Administration in UK, USA and India</td></tr>
<tr><td>Unit-3</td><td>Higher Education and Distance Education and Continuing Education</td></tr>
<tr><td></td><td>• Salient Features of Higher Education in UK, USA and India<br>-Aims, content, Methods of Instructions and Evaluation strategies<br>-RUSA<br>• Salient Features of Distance and continuing Education in UK, Australia and India<br>-Aims, Content, Methods of Instructions, Modes of Communication and Evaluation strategies<br>-Its Need and Various Concepts</td></tr>
<tr><td>Unit 4</td><td>Teacher Education and Vocationalization of Education</td></tr>
<tr><td></td><td>• Salient Features of Teacher Education in Finland and India<br>-Aims, content, Methods of Instructions and Evaluation strategies<br>• Salient Features of Vocationalization of Education in UK, USA and India<br>-Meaning and Needs of Vocationalization of Education<br>-Aims, Content, Methods of Instructions and Evaluation strategies<br>• Research trends in Comparative Education</td></tr>
<tr><td>Transactional Strategies</td><td>Internal Assessment Strategies :<br>A total of thirty marks have been allotted under Internal Assessment. The nature of the activity, mode and weightage of marks are as follows.
<table>
<tr><th>S. No.</th><th>Activity</th><th>Mode</th><th>Weightage of Marks</th></tr>
<tr><td>1</td><td>Two Sessional tests will be conducted (Better one will be considered)</td><td>Test</td><td>10</td></tr>
<tr><td>2</td><td>Preparation of an assignment on various topics and it is followed by presentation in the classroom (Group activity) & Practicum</td><td>Assignment & Presentation (PPT)</td><td>05+10</td></tr>
<tr><td>3</td><td>Percentage of attendance</td><td></td><td>05</td></tr>
<tr><td colspan="3">Total Marks</td><td>30</td></tr>
</table>
• Develop comparative chart in elementary school with help of their teachers, students and community.<br>• Critical appraisal/analysis of existing syllabi and textbooks on elementary level at national levels.<br>• Make a study of the evaluation practices in selected schools critical analysis of facilities provided in elementary levels.</td></tr>
</table>

**Suggested Readings:**


- Cramer, J.F. & Browne, C.S. (1965). *Contemporary education: A comprehensive study of national system* New York: Brace and world, Inc.
- Humbersone, T.H. (2018). A short history of education in great britain and ireland. England: Forgotten books
- Karen M., Kathy B. & Hayhoe R. (2017). *Comparative and International Education, (2nd Edc.)*. Canada: Canadian Scholars' Press
- Naseema, C. & Jibin, V.K (2012). *Comparative education*. Shipra Publication.
- Sharma, Y. K. (2004). *Comparative education-Comparative study of educational system*. Guwahati: Eastern Book House.
- Sodi, T.S. (2018). *Textbook of Comparative Education (6thEd.)*, New Delhi: Vikas Publication.
- UNESCO (1971). *Developing of Education in Asia*.Paris: Unesco, Mineda's.
- Young, D. (1995).*Introduction of American public education*. New York: McGraw-Hills Inc.
- Tulanatmak Shikshan – Dr. Seeteram Jaiswal, Dr. Ramdas Barkale, Dr. Nalini Pichad

| Year | II | COURSE CODE:SOE010437DCEC3014<br>GUIDANCE & COUNSELLING | Credit | 4 |
|---|---|---|---|---|
| Semester | IV | | Marks | 100 (Theory: 70, Internal: 30) |

**Objectives**

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

- Know the history of guidance and counseling in India
- Realize the importance of guidance and counseling
- Understand various techniques adopted for guidance and counseling
- Be sensitized to the need and importance of mental health
- Gain knowledge of various techniques and tools for assessing mental health of learners

| Teaching Scheme (session)* | | | | Total (L+T+P) | Examination Scheme | | |
|---|---|---|---|---|---|---|---|
| Unit | Lecture (L) | Tutorial (T) | Practicum (P) | | Internal Assessment | External Assessment | Total Marks |
| I | 12 | 4 | 0 | 16 | 30 | 70 | 100 |
| II | 12 | 2 | 1 | 15 | | | |
| III | 12 | 3 | 2 | 17 | | | |
| IV | 12 | 3 | 1 | 16 | | | |
| Total | 48 | 12 | 04 | 64 | 30 | 70 | 100 |

**Course Content / Syllabus**

**Unit -I** **Introduction to Guidance**

- Guidance Movement in India : Pre & Post Independence
- Concept, Principles & Functions of Guidance
- Types of Guidance: Educational, Vocational, Social & Personal Guidance.
- Group Guidance: Meaning, Objectives, Characteristics, Advantages, Problems, Principles & Techniques.
- Contemporary Models of Guidance: Mathewson Model, Sholen's Model, Chapman Model & Hoyt's Model.
- Organization & Evaluation of Guidance Programmes at Various Levels of Education (Elementary/ Secondary/ Senior Secondary /College)

| | |
|---|---|
| | • Problems of Organizational Guidance Services in India.<br>• Role of Various Community Agencies in School Guidance Programmes |
| **Unit -2** | **Introduction to Counseling & Career Guidance** |
| | • Concept, Principles, Techniques & Procedure of Counseling<br>• Approaches of Counseling: Directive, Non-Directive, Eclectic Counseling<br>• Theories of Counseling: Freud's Psychoanalytic, Behaviouristic, Gestalt<br>• Skills of Counseling: Building Trust, Listening, Observation & Empathy<br>• Counselor. Characteristics, Functions & Ethics<br>• Concept & Needs of Career Guidance<br>• Factors Affecting Career Guidance<br>• Approaches of Career Guidance |
| **Unit -3** | **Job Analysis and Occupational Information & Measuring Devices** |
| | • Concept and Needs of Job Analysis<br>• Meaning, Nature and Factors Affecting Job Satisfaction<br>• Relation between Job Analysis and Job Satisfaction<br>• Concept of Occupational Information & Sources of Collection<br>• Tools: Intelligence, Aptitude, Interest. Personality, Attitude, Achievement<br>• Techniques used in Guidance: Questionnaire, Anecdotal Records. Interview, Schedule, Case Study, Diary and Autobiography, Cumulative Record Cards |
| **Unit -4** | **Guidance for Special Groups & Mental Health** |
| | • Exceptional Learners: Slow- learners. Gifted & Creative Children.<br>• Delinquent. Backward and Under- Achievers Children.<br>• Mentaly and Physically Handicapped Children<br>• Guidance for the Well Being of Senior Citizens<br>• Concept of Mental Health<br>• Factor Affecting Mental Health<br>• Role of Guidance in Personnel in Promoting Positive Mental Health at Work Place |

| | |
|---|---|
| **Transactional Strategies** | Lectures, discussions, use of psychological tests, observation of students, conducting career guidance in the schools, counsel students by identifying their mental health problems such as lack of concentration, anxiety, anger etc. |

**Internal Assessment Strategies :**

**A total of thirty marks have been allotted under Internal Assessment. The nature of the activity, mode and weightage of marks are as follows.**

| S. No. | Activity | Mode | Weightage of Marks |
|---|---|---|---|
| 1 | Two Sessional tests will be conducted (Better one will be considered) | Test | 10 |
| 2 | Preparation of an assignment on various topics and it is followed by presentation in the classroom (Group activity) & Practicum | Assignment & Presentation (PPT) | 05+10 |
| 3 | Percentage of attendance | | 05 |
| **Total Marks** | | | **30** |

**Practicum :**

- Draw a plan for the assessment of ability, aptitude, interest or personality of students. Explore two tests
- One each for the assessment of intelligence and aptitude at the elementary and secondary stage through different sources and prepare critical write-ups.
- Prepare a script of a session with a client student communicating either low ability or high ability scores highlighting the skills used by you in the session.
- Prepare a sociometric test. Administer the test on a group of students. Draw a sociogram and describe in details the group climate.

**Suggested Readings:**


- Aggarwal, J.C. (2005). *Career information in career guidance theory & practice*. Delhi: Doaba House.
- Aggarwal, R. (2010). *Elementary guidance and counselling*. New Delhi: Shipra Publication.
- Bala, Rajni. (2007). *Guidance and counselling. Modern Review*. New Delhi: Afa Publication.
- Bernard, P. (2005). *Counselling Skills Training*. New Delhi: Viva Book Private Limited.
- Chandra, R. (2009). *Career information and guidance and counselling*. Delhi: Isha Books.
- Chandanpal (2018). *Guidance and counselling*. ND: Educational Publisher & Distributor.
- Chauhan, S.S. (2007). *Principle and techniques of guidance*. New Delhi: Vikas Publishing House
- Dev, K. (2005). *Educational guidance*. New Delhi: Pragun Publication.
- Gibson, R. L. & Mitchell, M. (2008). *Introduction counselling and guidance*. New Delhi: PHI Learning Pvt. Ltd.
- Gibson, Robert L. & Mitchell, Marianne. H. (2008). *Introduction to counselling and guidance*. New Delhi: Pearson Prentice Hall in India
- Gladding, R. (2018). Introduction to counselling. ND: Pearson.

- Gupta, M. (2005). *Effective guidance & counselling*. Jaipur: Mangaldeep publications.
- Kochhar, S. K. (2006). *Educational and vocational guidance in secondary education*. Delhi: Sterling Publications.
- Kochhar, S.K. (2009). *Guidance & counselling in colleges & universities*. New Delhi: Sterling Publishers Pvt Ltd
- Koshy, J. (2007). *Guidance and counselling*. New Delhi: Dominant Pub. & Distributors.
- Kottler, J. A. & Shepard. D. S. (2008). *Counselling theories & practices*. Cenage Learning: 1st Edition.
- Madhukumar, J. (2007). *Guidance and counselling*. New Delhi: Authors Press
- Mathur, S. S. (2008). *Fundamentals of guidance & counselling*. (2nd ed.). Agra: Aggarwal Publication.
- Mishra, R.C. (2004). *Guidance & counselling*. New Delhi: APH Publishing Corporation.
- Naik, D. (2007). *Fundamentals of guidance and counselling*. New Delhi: Adhyayan publishers.
- Pandey, V.C. (2006). *Educational guidance & counselling*. Delhi: Isha Books.
- Rao, S N. (2006). *Counselling and guidance*. Delhi: McGraw hill Publication.
- Rao, S. N. & Hari, H. S. (2004).*Guidance and counselling*. New Delhi: Discovery Pub. House.
- Safaya, B.N. (2002). *Guidance & counselling*. Chandigarh: Abhishek Publications.
- Saxena, A. (2006). *Organization of Guidance Service*. Delhi: Rajat Publications.
- Saxena, A. (2007). *Introduction to educational & vocational guidance*. Delhi: Rajat Publications.
- Sexena, A. (2007). *Modern techniques of counselling*. New Delhi: Rajat Publications.
- Sharma, R. A.(2011).*Fundamentals of guidance and counselling*. Meerut. R. Lal Book Depot.
- Sharma, S.P. (2008). *Career guidance & counselling*. New Delhi: Kanishka Publishers & Distributors.
- Sharma, T.C. (2002). *Modern methods of guidance & counselling*. New Delhi: Sarup & Sons.
- Sharma, Y K. (2005). *Principles of educational & vocational guidance*. New Delhi: Kanishka Publishers.
- Shrivastava, K.K. (2003). *Principles of guidance & counselling*. New Delhi: Kanishka Publishers.
- Singh, R. (2002). *Educational & Vocational Guidance*. New Delhi: Commonwealth Publishers.
- Varky, B. G. & Mukhopadhyay, M. (2006). *Guidance and Counselling*. New Delhi: Sterling Publications.
- Vashist, S.R. (2004). *Evaluation of Guidance*. New Delhi: Anmol Publications Pvt. Ltd
- Yadav, R.H. (2012). *Guidance & Counselling*. New Delhi: APH Publishing Corporation

| Year | II | COURSE CODE:SOE01043SC0044<br>DISSERTATION | Credit | 4 |
|---|---|---|---|---|
| Semester | IV | | Marks | 100 |

**Objectives**

**After the completion of the dissertation work , students will be able to:**

- Understand the process of conducting research.
- Know various statistical techniques used for analysing the data
- Critically analyse the related literature
- Contribute to new knowledge.
- Learn the process of publishing research output
- Suggest desirable changes in their area of study.

**Examination Scheme**

| Internal Assessment | External Assessment | Total Marks |
|---|---|---|
| 60 | 40 (Report Presentation & Viva-Voce) | 100 |
| **60** | **40** | **100** |

**Transactional Strategies**

- The dissertation is a compulsory 4 credit component of the M Ed. programme. A dissertation is distinguished from other writing assignments in the programme on the basis of the expectations and processes involved therein. It is visualized as a curricular space where students (with close mentorship/guidance of a faculty member) learn to plan and conduct research, and write a thesis. It is also a space where students come to see and draw linkages between education theory (transacted through taught courses) and research. Thus, while the product or the outcome of this component (i.e. the thesis) is important, the process through which it is arrived at is equally (if not more) significant. This makes a case for this component to be guided or mentored closely by a faculty mentor.

  (i.) Related to specialization / foundations Students (in close mentorship of a faculty member) learn to plan and conduct a research, and write a thesis.

  (ii.) The word limit for the dissertation may be between 15,000 to 20,000 words.

  (iii.) Each student has to submit a Dissertation on a topic, preferably from the Specialization Courses or in



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| | |
|---|---|
| | the areas introduced in the perspective courses at the end of the M.Ed. course before the commencement of the Theory Examination.<br>• While a dissertation may be submitted at the end of the Semester 4 of the programme, the process of arriving at it should begin early on, ideally in the Semester 1 onwards. This also means that the assessment of this component should be spread over various stages in this process, viz., developing a research proposal, presenting it, conducting the research, developing the first draft, finalizing the dissertation and presenting it in a viva-voce situation. All these stages should be given due weightage in the assessment of the dissertation. |

**Internal Assessment Strategies :**

**A total of thirty marks have been allotted under Internal Assessment. The nature of the activity, mode and weightage of marks are as follows.**

| S. No. | Activity | Mode | Weightage of Marks |
|---|---|---|---|
| 1 | Report Writing | Report Writing | 40 |
| 2 | Presentation | PPT | 10 |
| 3 | Viva-Voce | | 10 |
| **Total Marks** | | | **60** |

# GENERAL ELECTIVE COURSE

| Year | II | COURSE CODE: SOE010449GEC3014<br>INTRODUCTION TO COUNSELLING | Credit | 4 |
|---|---|---|---|---|
| Semester | IV | | Marks | 100 (Theory: 70, Internal: 30) |

**Objectives**

**On the completion of this course the students will be able**

- to understanding of Historical and Professional Foundations of Counselling in India
- to analyze their attitudes and beliefs about helping through self-assessment assignments
- to understand the roles, functions, and characteristics of counselors
- to counseling theories that provide the student with models to conceptualize client presentation and that help the student select appropriate counseling intervention

| Teaching Scheme (session)* | | | | Total (L+T+P) | Examination Scheme | | |
|---|---|---|---|---|---|---|---|
| Unit | Lecture (L) | Tutorial (T) | Practicum (P) | | Internal Assessment | External Assessment | Total Marks |
| I | 12 | 4 | 0 | 16 | 30 | 70 | 100 |
| II | 12 | 2 | 1 | 15 | | | |
| III | 12 | 3 | 2 | 17 | | | |
| IV | 12 | 3 | 1 | 16 | | | |
| **Total** | **48** | **12** | **04** | **64** | **30** | **70** | **100** |

**Course Content / Syllabus**

**Unit -1** — **Historical and Professional Foundations of Counselling**

- Counselling in India: History and Trends
- Personal and Professional Aspects of Counselling
- Ethical and Legal Aspects of Counselling
- Cultural Aspects of Counselling

**Unit -2** — **The Counselling Process and Assessment Interview**

- Building Counselling Relationships
- Testing, Assessment, and the Diagnosis in Counselling
- Working in a Counselling Relationship
- Termination of Counselling Relationships

| | |
|---|---|
| **Unit -3** | **Theories of Counselling** |
| | • Psychoanalytic and Psychodynamic Theories of Counselling<br>• Behavioural and Cognitive Theories of Counselling<br>• Humanistic Theories of Counselling |
| **Unit -4** | **Specialties in the Practice of Counselling** |
| | • Groups in Counselling<br>• Career Counselling Over the Life Span<br>• Marriage, Couple, and Family Counselling<br>• Counselling Children, Adolescents, and Young Adults |
| **Transactional Strategies** | Lectures - Session videos analysis- Case studies |

**Internal Assessment Strategies :**

**A total of thirty marks have been allotted under Internal Assessment. The nature of the activity, mode and weightage of marks are as follows.**

| S. No. | Activity | Mode | Weightage of Marks |
|---|---|---|---|
| 1 | Two Sessional tests will be conducted (Better one will be considered) | Test | 10 |
| 2 | Preparation of an assignment on various topics and it is followed by presentation in the classroom (Group activity) & Practicum | Assignment & Presentation (PPT) | 05+10 |
| 3 | Percentage of attendance | | 05 |
| **Total Marks** | | | **30** |

**Practicum :**

Draw a plan for the assessment of ability, aptitude, interest or personality of students. Explore two tests

- One each for the assessment of intelligence and aptitude at the elementary and secondary stage through different sources and prepare critical write-ups.
- Prepare a script of a session with a client student communicating either low ability or high ability scores highlighting the skills used by you in the session.
- Prepare a sociometric test. Administer the test on a group of students. Draw a sociogram and describe in details the group climate.

**Suggested Readings:**


- Brandes, B. (Ed.) (2016). *Introduction to counselling (2nd ed.)*. Toronto, ON: Athabasca University/Pearson Education Canada. Adapted from S. T. Gladding & K. G. Alderson.
- Burnard, P. (2005). *Counselling skills training*. New Delhi: Viva Book Private Limited.
- Chandra, R. (2009). *Career information and guidance and counselling*, Delhi: Isha Books.

- Chandanpat , (2018). *Guidance and counselling*. ND: Educational Publisher & Distributor.
- Chauhan, S S. (2007) *Principle and techniques of guidance* New Delhi: Vikas Publishing House.
- Gibson, R. L. & Mitchell, M. (2008). *Introduction counselling and guidance* New Delhi: PHI Learning Pvt. Ltd.
- Gibson, Robert L. & Mitchell, Marianne, H. (2016) *Introduction to counselling and guidance* New Delhi: Pearson Prentice Hall in India.
- Gladding, R.(2018). Introduction to counselling. ND: Pearson.
- Gupta, M. (2005). *Effective guidance & counselling*. Jaipur: Mangaldeep publications.
- Kochhar, S.K. (2009) *Guidance & counselling in colleges & universities*. New Delhi: Sterling Publishers Pvt Ltd.
- Mathur, S. S. (2008).*Fundamentals of guidance & counselling*. Agra: Aggarwal Publication.
- Mishra, R.C. (2004). *Guidance & counselling*. New Delhi: APH Publishing Corporation.
- Naik, D. (2007). *Fundamentals of guidance and counselling*. New Delhi: Adhyayan publishers.
- Rao, S N. (2006). *Counselling and guidance*. Delhi: McGraw hill Publication.
- Rao, S N. & Hari, H. S. (2004).*Guidance and counselling*. New Delhi: Discovery Pub. House.

# SYLLABUS

## B.Ed.

## (Bachelor of Education)




## School of Education

## Academic Session : 2018-20

## w.e.f. 03/01/2019



Annexure-V

## Course Structure of Bachelor of Education (B.Ed.) under Choice Based Credit System for the Session 2018-20

Total No. of Credits in Four Semesters = 98 (90 + 8) (B.Ed. Course +Course offered by other Department)

### B.Ed. Semester-I

| Sl. No. | Course Code | Total Credits | Paper Title | Total Marks | Credits (Theory/Tutorial/Practicum) | Class Teaching Hours per week | Internal Assessment Weightage | External Assessment Weightage |
|---|---|---|---|---|---|---|---|---|
| 1 | SOE020101C3104 | 4 | Childhood and Growing Up | 100 | 4 | 4 | 30% | 70% |
| 2 | SOE020102C3104 | 4 | Contemporary India and Education | 100 | 4 | 4 | 30% | 70% |
| 3 | SOE020103C3104 | 4 | Assessment for learning | 100 | 4 | 4 | 30% | 70% |
| 4 | SOE020104C3104 | 4 | Value and Peace Education | 100 | 4 | 4 | 30% | 70% |
| 5 | SOE020105C1102 | 2 | Language Across the Curriculum | 50 | 2 | 2 | 30% | 70% |
| 6 | SOE020106C1102 | 2 | Understanding Discipline and Subjects | 50 | 2 | 2 | 30% | 70% |
| 7 | SOE020107C1102 | 2 | Reading and Reflection on Text | 50 | 2 | 2 | 30% | 70% |
| 8 | | 4 | To be taken from other Department/MOOC | 100 | 4 | 4 | 30% | 70% |
| | Total | 26 | | 650 | 26 | 26 | | |
| | Practicum/Hands on/ Students Activity /Seminar/Workshop/etc; during Practicum hours | | | | | | | |
| • | • 1 Credit Theory = 16 hours in a semester<br>• 1 Credit = 25 Marks | | | | | | | |
| • | • Course Code offered to other Department in Semester I is presented in Table-1 | | | | | | | |

**Table-1: List of Courses offered by the School of Education to other Departments in Semester-I and III**

| Sl. No. | Course Code | Course Title | |
|---|---|---|---|
| 1 | SOE020134GEC3104 | Value Based Education | Semester I |
| 2 | SOE020135GEC3104 | Art in Education | Semester I |

## B.Ed. Semester-II

| Sl. No. | Course Code | Total Credits | Paper Title | Total Marks | Credits (Theory/Tutorial/ Practicum) | Practical | Class Teaching/ Field Based Activity Hours per week | Internal Assessment Weightage | External Assessment Weightage |
|---|---|---|---|---|---|---|---|---|---|
| 1 | SOE020208C3104 | 4 | Learning and Teaching | 100 | 4 | 0 | 4 | 30% | 70% |
| 2 | SOE020209C3104 | 4 | Knowledge and Curriculum | 100 | 4 | 0 | 4 | 30% | 70% |
| 3 | SOE020210C3104 -- SOE020217C3104 | 4 | Pedagogy of School Subject-1* | 100 | 4 | 0 | 4 | 30% | 70% |
| 4 | SOE020210C3104 -- SOE020217C3104 | 4 | Pedagogy of School Subject-2* | 100 | 4 | 0 | 4 | 30% | 70% |
| 5 | SOE020218C2024 | 4 | Drama and Art in Education | 100 | 2 | 2 | 6 | 30% | 70% |
| 6 | SOE020219C0022 | 2 | Critical Understanding of ICT | 50 | 0 | 2 | 4 | 30% | 70% |
| 7 | SOE020220C0044 | 4 | School Internship** | 100 | 0 | 4 | 8 | 60% | 40%* |
| | **Total** | **26** | | **650** | **18** | **8** | **34** | | |

**Practicum/Hands on/ Students Activity /Seminar/Workshopetc. during Practicum hours**

- **1Credit Theory = 16 hours in a semester**
- **1 Credit = 25 Marks**
- ***Pedagogy of School Subject-1* & Subject-2* may choose from List given below in Table-2.**
- ****Students will be engaged with school for the four weeks during the Semester.**

**Course Code offered to other Department in Semester II is presented in Table-3**

Table-2: List of Pedagogical Courses* offered by the School of Education in I$^{st}$ Year (Semester II)

| Sl. No. | Course Code | Course Title |
|---|---|---|
| 1 | SOE020210C3104 | Pedagogy of Hindi |
| 2 | SOE020211C3104 | Pedagogy of English |
| 3 | SOE020212C3104 | Pedagogy of Social Sciences |
| 4 | SOE020213C3104 | Pedagogy of Mathematics |
| 5 | SOE020214C3104 | Pedagogy of Life Science |
| 6 | SOE020215C3104 | Pedagogy of Physical Science |
| 7 | SOE020216C3104 | Pedagogy of Economics |
| 8 | SOE020217C3104 | Pedagogy of Commerce |

Table-3: List of Courses offered by the School of Education to other Departments in Semester-II

| Sl. No. | Course Code | Course Title | Semester |
|---|---|---|---|
| 1 | SOE020236GEC2024 | ICT in Education | Semester II |
| 2 | SOE020237GEC2024 | Essentials of Guidance and Counseling | Semester II |
| 3 | SOE020238GEC2024 | Performing and Visual Arts | Semester II |

## B.Ed. Semester-III

| Sl.No. | Course Code | Total Credits | Paper Title | Total Marks | Credits (Theory/Tutorial/ Practicum) | Practical | Class Teaching/ Field Based Activity Hours per week | Internal Assessment Weightage | External Assessment Weightage |
|---|---|---|---|---|---|---|---|---|---|
| 1 | SOE020321C001616 | 16 | School Internship* | 400 | 0 | 32 | 32 | 60% | 40% |
| 2 | | 4 | *To be taken from other Department/MOOC | 100 | 4 | 0 | 4 | 30% | 70% |
| | **Total** | **20** | | **500** | **4** | **32** | **36** | | |

**Practicum includes lesson planning/ Engagement with the field/ Hands-on experience/activities/seminars/workshops etc.**

courses for advanced level pedagogy ( senior secondary level) can be offered to post graduates in a school subject.

@ internship + school and community-based activities ( credits 14+2) = Marks 350+50=400

**Note: During School Internship School and Community-Based Activities may be arranged in terms of resources available in the teacher education institutions/university.**

***School Internship will be treated as Practicum Course.**

**1Credit Theory = 16 hours in a semester**

**1 Credit = 25 Marks**

*** Students will be engaged with school for 16 weeksduring the Semester.**

***Courses offered by the other Department: maximum -4 Credits**

## B.Ed. Semester-IV

| Sl.No. | Course Code | Total Credits | Paper Title | Total Marks | Credits (Theory/Tutorial/ Practicum) | Practical | Class Teaching/ Field Based Activity Hours per week | Internal Assessment Weightage | External Assessment Weightage |
|---|---|---|---|---|---|---|---|---|---|
| 1 | SOE020422C3104 | 4 | Gender, School and Society | 100 | 4 | 0 | 4 | 30% | 70% |
| 2 | SOE020423C3104 | 4 | Transaction of Curriculum: Issues & Challenges | 100 | 4 | 0 | 4 | 30% | 70% |
| 3 | SOE020424C3104 | 4 | Creating an Inclusive School | 100 | 4 | 0 | 4 | 30% | 70% |
| 4 | SOE020425C1102 | 2 | Understanding the Self | 50 | 2 | 0 | 2 | 30% | 70% |
| 5 | SOE020426C1102 | 2 | Environmental Education | 50 | 2 | 0 | 2 | 30% | 70% |
| 6 | SOE020427C2024 | 4 | Yoga Education | 100 | 2 | 2 | 6 | 30% | 70% |
| 7 | SOE020428DCEC1102-SOE020433DCEC1102 | 2 | Optional Course*-1 | 50 | 2 | 0 | 2 | 30% | 70% |
| 8 | SOE020428DCEC1102-SOE020433DCEC1102 | 2 | Optional Course*-2 | 50 | 2 | 0 | 2 | 30% | 70% |
| | **Total** | **24** | | **600** | **22** | **2** | **24** | | |

**Practicum/Hands on/ Students Activity /Seminar/Workshop/etc; during Practicum hours**

- **1Credit Theory = 16 hours in a semester**
- **1 Credit = 25 Marks*Optional Course may choose from Table-4.**

**Course Code offered to other Department in Semester IV is presented in Table-5**

**Table-4: List of Optional Courses offered by the School of Education in 2nd Year (Semester IV)**
**Choose any two from the following List**

| Sl. No. | Course Code | Course Title |
|---|---|---|
| 1 | SOE020428DCEC1102 | Educational Administration and Management |
| 2 | SOE020429DCEC1102 | Life Skills Education |
| 3 | SOE020430DCEC1102 | Guidance and Counselling |
| 4 | SOE020431DCEC1102 | Health &Physical Education |
| 5 | SOE020432DCEC1102 | Education in Indian Constitution |
| 6 | SOE020433DCEC1102 | Comparative Education |

**Table-5: List of Courses offered by the School of Education to other Departments in Semester-IV**

| Sl. No. | Course Code | Course Title | Semester |
|---|---|---|---|
| 1 | SOE020439GEC3104 | Educational management and Leadership | Semester IV |
| 2 | SOE020440GEC3104 | Peace education | Semester IV |

## ABOUT INTERNSHIP

**4 weeks of internship preparation and exposure to school life spread through different courses in First year and 16 weeks of internship in Second year which shall include two weeks of community based activities.**

**Marking Scheme:**

| | Examination Scheme | | |
|---|---|---|---|
| **School Based Internship Programme** | **Internal Assessment** | **External Assessment** | **Total Marks** |
| | **60 Marks** | **40 Marks** | **100 Marks** |

**Evaluation Stragies:**

| S. No. | Activity | Mode | Weightage of Marks |
|---|---|---|---|
| 1 | Skills in teaching (10 micro teaching lessions in both pedagogy Papers) | Presentation | 10+10 |
| 2 | School observation/Class room observation (both Teaching Subject) | - | 10+10 |
| 3 | Internal Viva | Viva-Voce | 10+10 |
| **Total Marks** | | | **30+30=60** |

**Essence of School Internship Programme (SIP)**

- School Internship would be a part of the broad curricular area of "Engagement with the field" and shall be designed to lead to development of a broad repertoire of perspectives, professional capacities, teacher sensibilities and skills. The curriculum of B.Ed. provides for sustained engagement with learners and the school, thereby creating a synergy with schools in the neighbourhood throughout the year. Student teachers shall be equipped to cater to diverse needs of learners in schools. The preparation of internship would be done through practicum activities across different courses and by making provisions for organising activities like visit to

educational resource centres, innovative centres of pedagogy and learning,etc. It shall be organised for 4 weeks in the **first year** of the course and spread throughout the year as per the resources available to the Teacher education institution (TEI)/ University.

- Students are to be actively engaged in planned teaching for 16 weeks in the **Second year** of the course. This should include two weeks of school and community based activities like cleanliness drive in the neighbourhood, awareness on environmental concerns,etc.
- Students are to be engaged in teaching at any two levels, namely, upper primary,secondary or senior secondary levels classes.They should be provided opportunities to teach in schools with systematic supervisory support and feedback from faculty. This should also include, besides practice teaching, an initial phase of classroom observation and faculty observations of practicelessons.The students will engage with 80 lessons in the B.Ed.practice teaching (i.e. 40 lessons in each of the two levels of education). Interns would also engage with peer observations, write reflective journals and take up short action research/mini projects on any aspect of the school life.
- Each student-teacher/intern is expected to divide the school internship time in two types of schools in the proportion of 80%-20% (i.e. Government-Private;English-vernacular;Rural-urban;Single-Multi grade;Tribal, minority schools,etc).
- TEI shall select schools as per their choice where student teachers will be allowed as Full Time Interns to undertake various activities.TEI.A TEI Faculty shall mentor and monitor the internship activities while the Principal and subject teachers shall also support/guide the intern in various activities. All of them will assess the interns and a collated grade shall be awarded to the student-teacher.

**The main aim of School Internship is the development of a broad repertoire of Perspectives in:**

- Professional competencies;
- Teacher dispositions, sensibilities and Teacher Interns (TI) towards catering to diverse needs of learners in schools; and
- Entire school organisation and management, including teaching-learning, co-curricular activities, school environment and cleanliness, and school innovation and leadership.

**Teaching Learning Experience**

During the Internship, a student-teacher shall work as a Full time teacher and participate in all the school activities and experience the school life, including:

- Planning;
- Teaching;
- Assessment;
- Interacting with school teachers;
- Interacting with community members; and
- Interacting with children.

**Expected Learning Outcomes**

The achievement of above aims of SIP will be done through the below mentioned goals, objectives and competencies:

**Goal 1:** Teacher Interns will develop competence and professional identity as a Teacher, by means of their engagement in school-classroom-community matters that will shape their perspective and develop their professional competence to exhibit ethical responsibility as a teacher.

**Objectives**

- Interns will demonstrate knowledge of the laws and regulations related to the professional practice of teaching, including any that specifically relates to State, Boards and NCTE.
- Interns will interact professionally with their peers, supervisors (Mentor Teachers and Educators), Administrators, school students and all other individuals encountered daily during the course of internship and will demonstrate professional maturity through their behaviour, appearance and attitude.
- Interns will engage in an ongoing exploration of their professional interests, strengths, and weaknesses.
- Interns will demonstrate professional responsibility with 'self- classroom- school' management, proper documentation & reporting, timely submissions-correction-signature and time management.
- Interns will be knowledgeable about their academic programs' requirements, inform their Supervisors/Mentors/Director of those requirements and communicate their needs if they feel that their internship needs are not being adequately met in the school.

***Activities***

1. Interns will conduct themselves in accordance with ethical principles of the practising school.
2. Interns will identify complex ethical situations that challenge professional values and seek guidance for addressing these situations from mentors at appropriate venue.
3. Interns will apply knowledge of perspectives, curriculum, pedagogy and enhanced professional capacity to their professional practice in schools.
4. Interns will be able to articulate individual theoretical perspectives and approaches, prior to, during, and after completing, internship experience and how they utilize it within the context of treatment in and outside classroom in school.
5. Interns will demonstrate awareness of the impact teachers' behaviour has on school children, staff members, the public, and the profession.
6. Interns will complete required case documentation, report it and get it evaluated (signed) promptly and accurately.
7. Interns will facilitate completion of individual program requirements including necessary hours.

**Goal 2:** Interns will inculcate and demonstrate necessary skills *(communicative-administrative-managerial)* in different roles (*as a subject teacher, class teacher, individual and group counsellor in school premise, as performance assessor, reporting assessments and providing*

*feedback, as a leader effectively responding to crisis situations in the school campus, and a proactive manager engaging in consultation and collaboration)* for excelling as a professional teacher.

**Objectives**

- Interns will demonstrate the ability to communicate as a teacher, administrator and manager of various activities in and outside the classroom (class, laboratories, play-fields, common places like canteen, library, office, entertainment spots etc.).
- Interns will demonstrate knowledge of one's own limitations as a teacher, administrator and manager of various activities including acknowledgment of and inexperience with certain types of children, colleagues, situations and practical areas of weakness in understanding of theory and their applications.
- Interns will effectively assess holistic aspects of students and record them thorough documentation. They will demonstrate the ability to effectively handle individual student and follow-up with individual crisis situations utilizing consultation and collaboration through professional knowledge of self and their mentors.
- Interns will demonstrate involvement in all school processes through preparedness, punctuality, evidence of thoughtfulness, openness to feedback and exploration of issues, ability to articulate own position on a given issue, and willingness to share his or her own work in form of presentation of hand written reports/recordings/videotapes, case reports etc.
- Interns will demonstrate a professional ability to refer individual, group or school issues for acknowledgement, reporting, discussion or solution to administrators, parents, community members or appropriate authorities as and when needed.

**Activities**

1. Interns will participate in all regularly scheduled activities of the school.
2. Interns will become familiar with all sorts of formal and informal activities in and outside classroom in the school campus.
3. Interns will better understand the beliefs, attitudes, and behaviour of diverse individuals (students) in the class and learn to observe, identify and report them for feedback and holistic growth of child to appropriate professional and community members.
4. Interns will identify their own weaknesses in dealing with students and themselves; hence will handle oneself in a more appropriate professional manner.
5. Interns will learn to communicate effectively using variety of media (ICT etc.) in and outside the classroom to work professionally as a successful teacher excelling as communicator-administrator-manager.

**Goal 3:** *Interns will develop skills and competencies for working with diversities (individual, cultural, gender, special ability, etc.) in school and community hence learn to operate successfully and develop an inclusive setting.*

**Objectives**

- Interns will demonstrate the ability to examine their own attitudes, assumptions, behaviours, and values in working with individuals with various types of diversity issues.
- Interns will demonstrate the ability to provide services sensitive to individuals with various types of diversity issues.
- Interns will demonstrate the ability and readiness to seek consultation with mentors/experts for dealing with individuals having various types of diversity issues prior to further engaging in teaching- learning.

Activities

1. Interns will explore personal biases, stereotypes and cultural assumptions as they affect their professional practice as a School Teacher.
2. Interns will provide, culturally-relevant and competent services for holistic growth, to students from diverse populations attending the schools.
3. Interns will become more aware of how culture influences their world- view, life- view and professional practice as a School Teacher.

**Goal 4**: *Interns will demonstrate the professional ability to provide education; outreach and liaison including school and neighbourhood watch and cleanliness through collaboration with the school community and off-school campus community, interdisciplinary colleagues/experts and Teacher Education Institutions. They will also ensure sharing of continuous and comprehensive assessment based performance of learners in Parent-Teacher Meetings for sustained growth of the learner.*

**Objectives**

- Interns will demonstrate the ability to participate in community activities, collaborate with the Health Centre, Sports Centre, Student Affairs professionals, school staff, other school teachers, parents, University Departments, Teacher Education Departments, administrative units in and outside school (Boards, railways, roadways, NCC, etc.).
- Interns will demonstrate competence in facilitation and presentation skills using appropriate technology and with proper documentation for ensuring efficient liaisoning.
- Interns will actively participate in Continuous and Comprehensive Evaluation (CCE) and PTA meetings in the school.

**Activities**

1. Interns will be knowledgeable about consultation and liaison relationships in general and with particular regard to a school community.
2. Interns will develop ability to participate in various extension activities and administrative works related to welfare of individual students and community.
3. Interns will become efficient in CCE based assessment procedures, reporting and PTA meeting conduction in schools.

**Duration: 16 weeks**

The B.Ed. curriculum shall provide for sustained engagement with:

- the Self,
- the Child,
- the Community, and
- the School

At different levels, and by establishing close connections between different curricular areas.

- In the first year, there shall be engagement with the field and practicum through different courses to develop an integrated picture and perception of school and classroom, along with experience of teaching and feedback etc.
- Minimum 16 (Sixteen) weeks are for school internship which would include engaging with teaching and experiencing school life. It would also include community based activities and observation and documentation of at least two types of Schools- Government/private,rural/urban,single/multi grade,tribal and Inclusive/Special schools / Low achievement schools / high achievement schools etc.

**Suggested outline of School Internship Programme**

The Pupil Teachers/Teacher Interns will have the opportunity to enhance planning, teaching and assessment, interacting with school teachers, interacting with community members and interacting with children.

The Teacher Intern will have opportunity to work as a regular teacher and participate in all the school activities, including:

- Planning,
- Teaching,
- Assessment,
- Interacting with School Teachers,
- Interacting with Community Members,
- Interacting with Children.

- Crisis Management, and
- Involvement in Outreach Activities.

1. On every working day Pupil Teacher (PT) /TI will get direction by a Mentor School Teacher (MST) during school hours. During four weeks in Semester I and II the Mentor Prospective Teacher Educator (MPTE) and Mentor Teacher Educator (MTE) will observe **(regularity and up keep of records)**, interact, advise and instruct the PT/TI.

2. During sixteen weeks internship, each week Interns will receive 2 hours of weekly individual supervision/ group supervision by Mentor Teacher Educator/s (based on group discussion among internees, problems, experiences, cases will be discussed and Day-wise Weekly Reports will be checked and verified), and 2 hours of weekly training seminars by Internship Director (ID) and Core Group for Internship (CGI).

   Seminars and consultations will be provided by the CGI which will include a team of Teacher Educators, School Teachers/ Educational Administrators i.e. professionals in the field of teaching and school administration.

**Suggested Training Activities**

**i) Individual Supervision**

Each intern will receive at least 2 hours per week of regularly scheduled effective supervision from a Teacher Educator. Additional unscheduled supervision and consultation with the supervisor and other staff members are available and encouraged. Individual supervision will focus primarily on an intern's personal strengths and weaknesses as a teacher, communicator and leader/ manager of the classroom events. Conduct in the class and teacher ethics (ethical conduct towards students, ethical conduct towards profession, ethical conduct towards peers and colleagues, and ethical conduct towards community and parents) and other professional issues are to be monitored and equally valued for discussion.

Supervisor/Mentor Teacher Educators may be rotated during mid-semester so that interns will have an opportunity to experience different supervisory styles. The primary supervisor/mentor will be responsible for ensuring that intern is getting a comprehensive experience in holistic terms of theory and practice in school and classroom (inside and outside). The primary supervisor/mentor will monitor all written and verbal communications regarding all aspects and will co-sign progress notes and reports. The primary supervisor will also monitor the intern's adherence to internship guidelines and procedures. Additionally, the primary supervisor/mentor will be responsible for evaluating the intern's performance during internship and providing feedback to the intern.

It is the responsibility of the intern to keep his/her supervisor/mentor apprised of all issues during internship. In the event that a supervisor/mentor is unavailable (leave etc.), the intern should inform/consult with another professional staff member who has taken the responsibility during that period.

ii) Group Supervision

Interns will meet together with the Internship Director (ID) and Core Group for Internship (CGI) for at least 1/2 hour/s each week to discuss internship issues and seek advice to gain additional support for holistic development as a school teacher.

**Suggested SIP Authorities and Key-Terms**

The effectiveness of SIP depends on the authorities and their professional touch related to SIP. Therefore, for effective implementation of SIP following authorities'/key terms will be in use.

*Internship Director (ID):*The Head / Principal or his/her nominee shall be the Internship.

*Core Group of Internship (CGI):* It will consist of a group of Teacher Educators of which there shall be at experts from different pedagogy areas. Besides, there will be one senior teacher educator (preferably Professor) and one Teacher Educator (Associate Professor/ assistant Professor). All members will be nominated by the Head / Principal. One of them will be the convenor. For smooth conduction, facilitation and official liasoning the core should be provided Secretarial assistance through one office assistance and a peon. The CGI will also be responsible for allotment of Mentors and attaching five TIs with each Mentor. Similarly, the attachment of MPTE will be ensured by CGI in the case where M.Ed. course also exists. Thus CGI will work out modality for ensuring successful organization of "engagement with school" in coordination with ID.

*School Principal:*Principal/s of the school/s chosen for SIP.

*Mentors:*There will be following three categories of mentors (Number of TI allotted to each mentor should be preferably five to ten only) –

- Mentor School Teacher (MST): School teacher assigned the responsibility of mentoring.
- Mentor Teacher Educator (MTE): School teacher assigned the responsibility of mentoring. (At least five MPTE will be attached to each MTE for smooth mentoring. Five TI will be allotted to each MTE)
- Mentor Prospective Teacher Educator (MPTE)*: M.Ed. Students and Research Scholars will be MPTE. (At least five MPTE will be attached to each MTE for smooth mentoring.)

* Subject to M.Ed. Course being run in an institution. *Teacher Intern (TI) or Pupil Teacher:* The B.Ed. student admitted in the Teacher Education Institution and issued permission letter for internship by the CGI in consultation with the ID.

**Suggested Specific Procedure of SIP**

***First Year:*** Gaining some experience with the child, the community and schools in First Year through practicum and engagement with field across different courses.

**Annexure-3: List of Abbreviations**

The following terms have been used as abbreviations in the SIP document:

| | | |
|---|---|---|
| SIP | : | School Internship Program |
| *PES* | : | Pre-internship Engagement in Schools |
| *PESCL* | : | Pre-internship Engagement in Schools Completion Letter |
| *SIPPL* | : | School Internship Program Permission Letter |
| *SIPD* | : | School Internship Program Diary |
| *ID* | : | Internship Director |
| *CGI* | : | Core Group of Internship |
| *TI* | : | Teacher Intern/Pupil Teacher |
| *MTE* | : | Mentor Teacher Educator |
| *MST* | : | Mentor School Teacher |
| *ICT* | : | Information and Communication Technology |
| *CCE* | : | Continuous and Comprehensive Evaluation |
| *PTA* | : | Parents Teachers' Association |
| *SMC* | : | School Management Committee |
| *BOD* | : | Board of Directors |
| *SIPCL* | : | School Internship Program Completion Letter |
| *TISIPES* | : | Teacher Intern School Internship Program Evaluation Sheet |
| *SICC* | : | School Internship Completion Certificate |

# SEMESTER II

## LEARNING AND TEACHING
## COURSE CODE -SOE020208C3104

**Year: I** **Credit: 4**

**Semester: II** **Max Marks: 100**

**Essence of the Course**

This course focuses on developing understanding of concept of teaching along wih phases, lavels and maxims of teaching. It also focusses on theories of learning and their educational implications. The course aims to develop conceptual understanding of process of creativity and intelligence along with it's various theories. The course also highlights about the teaching as profession, skills of teachers for effective teaching and approaches to teaching.

**Objectives:** After completing this course, the pupil-teachers will be able to:

- relate variables of teaching process with the concept of teaching
- identify the relationship between teaching style & learning styles
- apply the maxims of teaching and approaches to teaching
- estimate the use of Phases of Teaching and Levels of Teaching
- explain the educational implications of different theories of learning
- identify the creative potentiality of learners
- comprehend the concept, nature and various theories of intelligence
- identify and suggest various skills & competencies in classroom teaching & management
- critically evaluate the role of a teacher as transmitter and facilitator of knowledge

| Teaching Scheme (session)* | | | Total (L+T+P) | Examination Scheme | | |
|---|---|---|---|---|---|---|
| | | | | Internal Assessment | External Assessment | Total Marks |
| Unit | L | T/P | C | | | |
| I | 10 | 4 | 14 | | | |
| II | 14 | 4 | 18 | 30 Marks | 70 Marks | 100 Marks |
| III | 12 | 4 | 16 | | | |
| IV | 12 | 4 | 16 | | | |
| Total | 48 | 16 | 64 | 30 Marks | 70 Marks | 100 Marks |
| L=Lecture, T=Tutorial, P=Prictícum | | | | | | |

**Course Content:**

**Unit I: Understanding the Teaching**

- Teaching : Concept, Nature & Characteristics
- Phases and Levels of Teaching
- Maxims of Teaching
- Teaching & Learning Styles: Concept, Meaning, & implications for classroom environment

**Unit II: Learning and It's Theories**

- Learning: Meaning, Definition and Characteristics and Factors affecting learning
- Learning Theories and their Educational Implications
  - Learning by Trial and Error (Thorndike)
  - Learning by Stimulus – Response Conditioning (Pavlov & Skinner)
  - Gestalt theory – Learning by insight
  - Cognitive theory - Ausubel
  - Social Cognitive theory – Vygotsky

**Unit III: Creativity & Intelligence**

- Creativity: Concept, nature, process
- Identification & Techniques of fostering creativity in classroom
- Intelligence: concept, meaning and nature
- Theories of Intelligence
  - Spearman's Two Factor Theory
  - Thurston's Group Factor Theory
  - Gardner's Theory of Multiple Intelligence

**Unit IV: Teaching Profession and Approaches of Teaching**

- Teaching as Profession
- Role of a teacher in teaching-learning process (as Transmitter of knowledge and Facilitator of Knowledge)
- Professional Ethics of Teachers
- Skills & Competencies of 21st century teachers

- Approaches to Teaching: Behaviourist and Constructivist

**Transactional Strategies:**

Interactive development of concerned topics and theories with the help of various multimedia applications like; Google Classroom, Google Group, Google Drive, related Articles and other materials from various reputed online resources, Lecture cum discussion, Use of PPT, Assignments on various topics. Debate on various factors affecting teaching learning process & panel discussion, Brainstorming Session and in-depth analysis of various theories of learning by the pupil teachers.

**Internal Assessment Strategies:**

A total of thirty marks have been allotted under Internal Assessment. The nature of the activity, mode and weightage of marks are as follows:

| S. No. | Activity | Mode | Weightage of Marks |
|---|---|---|---|
| 1 | Two Sessional tests will be conducted (better one test will be considered) | Test | 10 |
| 2 | Preparation of the assignments on various topics and followed by presentation in the classroom **(Group activity)** + Practicum | Assignment & Presentation (PPT) | 05 + 10 |
| 3 | Percentage of attendance | --- | 05 |
| | **Total Marks** | | **30** |

**Practicum: Suggestive List:**

1) Presentation on the comparative analysis of the various learning theories through multimedia approach.
2) Analysis of influential factors affecting learning to the same class and students on the basis of regular visit (one week) to school.
3) Report on effective teacher behaviour or classroom instruction strategies of effective teacher.

**Suggested Readings:**


- Bigge, M. L. (1982). *Learning theories for teachers* (4th edition). New York: Harper and Row Publishers.
- Chauhan, S.S. (2007). *Advanced educational psychology*(7th edition). New Delhi: Vikas Publishing House Pvt. Ltd.
- Chauhan, S.S. (2014). *Innovations in teaching learning process*. Noida: Vikas Publishing House Pvt. Ltd.
- Dececco, J.P. (1988). *The psychology of learning and instruction*. New Delhi: Prentice Hall.
- Wheldall, K. (2006). *Developments in educational psychology*. New York: Routledge.
- Hergerhahn, B.R. (1976). *An introduction to theories of learning*. Englewood Cliffs, NJ: Prentice Hall.

- Kumar, S. (2016). *Child development and pedagogy*. Delhi: Pearson Education (Singapore) Pvt. Ltd.
- Lefrancois. G.R. (1999). *Psychology for teaching* (10th edition). London: Woodsworth Publishing.
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- Siddiqui, M. H. (2005). *Techniques of classroom teaching*. Delhi:APH Publishing Corporation.
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- Snowman., & Bahler. (2006). *Psychology applied to teaching*. Boston: Houghton Mifflin Company.
- Snowman., J., & Biehler, R. (2002). *Psychology applied to teaching*. New York : Houghton Mifflin.
- Stephens, L.M., & Evans. E.D. (1973). *Development and classroom learning: An introduction to educational psychology*. New York: Holt, Rinehart and Winston, Inc.
- Tanner, L.N., & Lindgren, H.C. (1971). *Classroom teaching and learning*. New York: Holt. Rinehart and Winston, Inc.
- Upadhya,B.& Singh Y.K.(2011). *Encyclopaedia of education psychology* (Vol. I to II).Delhi: APH Publishing Corporation.
- Woolfolk, A. (2017). *Educational psychology* (13th edition). Delhi: Pearson Education (Singapore) Pvt. Ltd., Indian Branch.


**Web Resources:**

Jane Chumwari Gatumu, Reflective Teaching. http://oer.avu.org/bitstream/handle/123456789/155/REFLECTIVE-TEACHING.pdf?sequence=1

https://www.ibo.org/globalassets/digital.../approaches-to-teaching-learning-dp-en.pdf

## KNOWLEDGE AND CURRICULUM

## COURSE CODE -SOE020209C3104

**Year: I**
**Semester: II**

**Credit: 4**
**Max Marks: 100**

**Essence of the Course**

Every teacher deals with creation of congenial environment for curriculum transaction. Teacher's job is primarily concerned with operationalizing various curricular practices. Teacher's understanding of the nature of knowledge in the context of school subjects is considered most essential. It aims to provide knowledge and skills to student teachers relating to curriculum development, implementation and evaluation. Different concepts like types & sources of knowledge, methods of acquiring knowledge and their interrelations with education have been covered in this course. The nature of school curriculum and its foundations, transaction process etc. have also been highlighted in this course.

**Objectives:** After completing this course, the student-teachers will be able to:

- describe epistemological bases of knowledge.
- list the source of knowledge and various methods of acquiring knowledge.
- compare the Indian and Western views about knowledge
- acquaint with the meaning and concepts of curriculum.
- differentiate curriculum and syllabus
- identify factors affecting curriculum
- familiar with the types of curriculum
- develop activity based curriculum
- elaborate the concepts and approaches of curriculum development.
- apply the various models of curriculum development
- acquaint with the curriculum reforms in the Indian context.

| Teaching Scheme (Session)* | | | Total (L+T+P) | Examination Scheme | | |
|---|---|---|---|---|---|---|
| | | | | Internal Assessment | External Assessment | Total Marks |
| Unit | L | T/P | C | | | |
| I | 12 | 4 | 16 | | | |
| II | 12 | 4 | 16 | 30 Marks | 70 Marks | 100 Marks |
| III | 12 | 4 | 16 | | | |
| IV | 12 | 4 | 16 | | | |
| Total | 48 | 16 | 64 | 30 Marks | 70 Marks | 100 Marks |
| L=Lecture, T=Tutorial, P=Practicum | | | | | | |

## Course Content:

**Unit I: Epistemological Bases of Knowledge**

- Concept of Knowledge: Meaning of information, knowledge and wisdom.
- Types & Sources of Knowledge
- Methods of Acquiring Knowledge
- Structures and Forms of Knowledge

**Unit II:Knowledge: Indian and Western Views**

- Indian Views:
  - ✓ Shankhya
  - ✓ Vedanta
  - ✓ Buddhism
- Western Views:
  - ✓ Idealism
  - ✓ Naturalism
  - ✓ Pragmatism

**Unit III: Conceptual understanding of Curriculum**

- Meaning and concept of curriculum; Difference between Curriculum and Syllabus
- Characteristics of curriculum

- Factors affecting curriculum i.e. Philosophical, Sociological, Psychological, Historical
- Types of curriculum: Core, Hidden, Null, Differentiated curriculum and Activity -based curriculum

**Unit IV: Basics of Curriculum Development**

- Meaning of Curriculum development
- Need, Importance and Process of Curriculum development
- Principles of curriculum development
- Models of curriculum development
  - ✓ Grass Root Model
  - ✓ Administration Model
  - ✓ System Analysis Model

**Transactional Strategies**

Lecture cum discussion, Use of PPT, Assignments on various topics, presentation and discussion, Lecture cum demonstration, Preparation of activity based curriculum in groups and discussion, Debate on various factors affecting curriculum, chart preparation on various models and process, In depth analysis of various models of curriculum development by the student teachers and presentations will be encouraged.

**Internal Assessment Strategies**

A total of thirty marks have been allotted under Internal Assessment. The nature of the activity, mode and weightage of marks are as follows.

| S. No. | Activity | Mode | Weightage of marks |
|---|---|---|---|
| 1 | Two sessional test (better one test will be considered) | Test | 10 |
| 2 | Preparation of an assignment on various topics and it is followed by presentation in the classroom **(Group activity) + Practicum** | Assignment & Presentation (PPT) | 5+10 |
| 3 | Percentage of attendance | | 05 |
| **Total Marks** | | | 30 |

**Practicum:**

- Preparation of activity based curriculum in groups and discussion.
- Chart preparation on various models of curriculum
- Visit to DIET, Schools to find out the role personnel in curriculum development process.

**Suggested Readings:**


- Aggrawal, J.C., & Gupta, S. (2005). *Curriculum development*. New Delhi: Shipra Publisher.
- Alexander, W.M., & Saylor, J.G. (1966). *Curriculum planning for modern schools*. New York: Holt, Rinhart and Winston Inc.
- Balrara, M. (1999). *Principles of curriculum renewal*. New Delhi: Kanishka Publishers.
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- Erickson, H.L. (2007). Concept based curriculum and instruction for the thinking classroom California: Corwin Press.
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- Jenkins, D. & Shiffman, D.M. (1976). *Curriculum an introduction*. London. Pitman Publishing House.
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- Kumari, S. & Srivastava, D.S. (2005). *Curriculum and Instruction*. New Delhi: Shipra Publishers.
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- Ornstein, A.C. & Hunkins, F. (1988). *Curriculum foundations, principles and issues*. New Jersey: Prentice Hall.
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- Rajput, J.S. (2004). *Encyclopedia of Indian Education*. New Delhi: NCERT.
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- Sharma, R. (2002). *Modern methods of curriculum organisation*. Jaipur: Book Enclave.
- Sharma, S.R. (1999). *Issues in curriculum administration*. New Delhi: Pearl Publishing House.
- Sockett, H. (1976). *Designing the curriculum*. Britain: Pitman Press.
- Srivastava, H.S. (2006). *Curriculum and methods of teaching*. New Delhi: Shipra Publishers.
- Tata, H. (1962). *Curriculum development theory & practice*. New York: Harcourt, Brace & World Inc.
- Yadav, Y.P. (2006). *Fundamentals of curriculum design*. New Delhi. Shri Sai Printographers Ainsworth, L. (2014). Rigorous curriculum design: How to create curricular units of study that align standards, instruction, and assessment. Houghtom Mifflin Harcourt Publishers.


**Web Resources:**

- Systemic Reforms for Curriculum Change.
  http://www.ncert.nic.in/new_ncert/ncert rightside/links pdf/focus_group/Systemic_reforms_final.pdf
- Curriculum, Syllabus and Textbooks. http://www.ncert.nic.in/new_ncert/ncert/rightside_links/pdf/focus_group/cst_final.pdf

# PEDAGOGY OF HINDI
## COURSE CODE -SOE020210C3104

**Year: I** | **Credit: 4**

**Semester: II** | **Max Marks : 100**

पाठ्यक्रम का सार

यह पाठ्यक्रम एक बहु सांस्कृतिक और बहुभाषी वातावरण में छात्र शिक्षकों की हिन्दी भाषा और संचार क्षमता के विकास पर केन्द्रित है। यह छात्र शिक्षकों के अलग–अलग हिन्दी भाषा के विकास को ध्यान में रखते हुए तैयार किया गया है और यह पाठ्यक्रम शिक्षक शिक्षकों को हिन्दी भाषा एवं हिन्दी भाषा शिक्षण की विधियों में निपुण बनायेगा।

उद्देश्य :

- भाषा की अलग–अलग भूमिकाओं को जानना
- स्कूल की भाषा, बच्चों की भाषा और समझ के बीच संबंध जानना
- पाठ्यचर्या, पाठ्यक्रम का विश्लेषण कर कक्षा विशेष और बच्चों की समझ के अनुसार ढालना।
- हिन्दी भाषा के विविध रूपों की अभिव्यक्तियों को जानना
- भाषा के विभिन्न कौशलों का विकास करना
- भाषा के मूल्यांकन की प्रक्रिया को जानना।

| Teaching Scheme (session)* | | | Total (L+T+P) | Examination Scheme | | |
|---|---|---|---|---|---|---|
| | | | | Internal Assessment | External Assessment | Total Marks |
| Unit | L | T/P | C | | | |
| I | 12 | 4 | 16 | 30 Marks | 70 Marks | 100 Marks |
| II | 12 | 4 | 16 | | | |
| III | 12 | 4 | 16 | | | |
| IV | 12 | 4 | 16 | | | |
| Total | 48 | 16 | 64 | 30 Marks | 70 Marks | 100 Marks |

L=Lecture, T=Tutorial, P=Prieticum

पाठ्यक्रम की विषय वस्तु

इकाई–1. हिन्दी भाषा अधिगम की प्रक्रिया

- हिन्दी भाषा की भूमिका,प्रकृति एवं महत्व।
- हिन्दी भाषा अधिगम के सामान्य सिद्धान्त।
- हिन्दी शिक्षण के उद्देश्य : ज्ञानात्मक उद्देश्य, कौशलात्मक उद्देश्य, सौन्दर्य बोधात्मक उद्देश्य, रचनात्मक उद्देश्य, अभिरूचनात्मक तथा अभिवृत्तात्मक उद्देश्य।
- बहुभाषी शिक्षण का अर्थ स्वरूप महत्व सामान्य सिद्धान्त लक्ष्य एवं उद्देश्य

इकाई– 2 : हिन्दी भाषा शिक्षण की विभिन्न विधाएँ

- हिन्दी शिक्षण में सूचना तकनीकी की उपयोगिता एवं गुण ।
- हिन्दी भाषा शिक्षण में क्रियात्मक अनुसंधान–अर्थ, महत्व एवं प्रक्रिया, हिन्दी में क्रियात्मक शोध योजना का प्रारूप।
- पद्य, गद्य एवं व्याकरण शिक्षण का अर्थ उद्देश्य, महत्व, सीमाएँ एवं सोपान ।
- वाचन प्रक्रिया एवं प्रकार।

इकाई 3 : हिन्दी भाषा शिक्षण के भाषाई कौशलों का विकास

- श्रवण कौशल– अर्थ, प्रकार, शैक्षिक क्रिया कलाप।
- मौखिक अभिव्यक्ति कौशल के उद्देश्य, मौखिक अभिव्यक्ति विकास की क्रियाएं मौखिक अभिव्यक्ति सम्बन्धी त्रुटियों का निवारण।
- पठन कौशल की प्रक्रिया, प्रकार, पठन अभिरुचि का विकास, पठन सम्बन्धी त्रुटियों का निवारण।
- लिखित अभिव्यक्ति कौशल का विकास, लेखन का महत्व, प्रक्रिया, लिखित रचना के प्रकार एवं उनका शिक्षण

इकाई–4 हिन्दी भाषा शिक्षण के लिए अनुदेशन योजना

- ब्लूम द्वारा निर्धारित अनुदेशनात्मक उद्देश्य।
- हिन्दी शिक्षण कौशलों का विकास प्रस्तावना कौशल, स्पष्टीकरण कौशल, उदाहरण कौशल, व्याख्या कौशल और उद्दीपन परिवर्तन कौशल।
- हिन्दी पाठ योजना (गद्य, पद्य एवं व्याकरण) का अर्थ, महत्व, एवं रूपरेखा।
- हिन्दी में मूल्यांकन– अर्थ, स्वरूप, विभिन्न विधाओं का मूल्यांकन एवं संशोधन।

कार्य सम्पादन रणनीतियाँ

इकाई–1 व्याख्यान, समूह चर्चा, पावर प्वाइंट प्रस्तुतियां एसाइनमेंट्स और ई–लर्निंग का उपयोग

इकाई -2 व्याख्यान, चर्चा, स्कूल के अध्ययन के अनुभव के भाषा के खेल, ऑडियो और वीडियो सामग्री आदि का उपयोग।

इकाई–3 व्याख्यान विधि– समूह चर्चा, प्रदर्शन विधि का प्रयोग एवं पावर पाइंट प्रस्तुति, ई–लर्निंग आदि का उपयोग।

इकाई–4 व्याख्यान विधि समूह चर्चा, प्रदर्शन विधि का प्रयोग एवं पावर पाइंट प्रस्तुति, ई–लर्निंग, एसाइनमेंट्स का उपयोग।

आन्तरिक मूल्यांकन रणनीतियाँ : आन्तरिक मूल्यांकन हेतु 30 अंक निर्धारित है। अंकों का निर्धारण इस प्रकार है–

| S.No. | Activity | Mode | Weightage of Marks |
|---|---|---|---|
| 1 | Two Sessionaltests will he conducted. (better one test will be considered) | Test | 10 |
| 2 | Preparation of an assignment on various topics and it is followed by presentation in the classroom (Group activity) + Practicum | Assignment& Presentation (PPT) | 05 +10 |
| 3 | Percentage of attendance | --- | 05 |
| Total Marks | | | 30 |

व्यावहारिककार्य–

- छात्रों में संचार की समस्या/आशक्ति का पता लगाने के लिए बड़ी स्कूलों का दौरा।
- श्रवण, मौखिक, पठन और लेखन कौशल विकसित करने के लिए खेल और व्यायाम करना।
- श्रवण, मौखिक, पठन और लेखन कौशल विकसित करने पर गतिविधियां–शैक्षिक प्रस्तुतियें, बहस भाषण, चर्चा एवं ब्रेन स्टार्मिंग, अनुच्छेद एवं निबंध लेखन।

इसके अतिरिक्त विद्यालय एवं समुदाय आधारित गतिविधियों भी आयोजित की जायेगी जिसके अन्तर्गत छात्रों को अधिगम एवं शिक्षक प्रशिक्षण संस्थाओं पे भ्रमण कराया जायेगा। शिक्षण प्रशिक्षण एवं स्कूल आधारित क्रियात्मक अनुसंधान भी कराये जायेंगे।

**संदर्भ ग्रन्थ सूची :**


- अग्निहोत्री, आर.के. (2017). *एरर एज लर्निंगस्ट्रेटजीज*. इंडियन जर्नल ऑफ अप्लायड लिंग्विस्टिक्स 14 1.1–14
- अग्रवाल, कृ. (2018). *वृहद हिन्दी शिक्षण*. नई दिल्ली. आर्य पब्लिशिंग कम्पनी।
- *अंकलन स्कोर पुस्तिका* राष्ट्रीय शैक्षिक अनुसंधान और प्रशिक्षण परिषद, नई दिल्ली।
- *अभिव्यक्ति और कलाएं* राष्ट्रीय अनुसंधान और प्रशिक्षण परिषद, नई दिल्ली।
- राष्ट्रीय पाठ्यचर्या की रूपरेखा (2005), प्रकाशनविभाग, राष्ट्रीय शैक्षिक अनुसंधान और प्रशिक्षण परिषद, नईदिल्ली।
- *सरल का सहयोग* राष्ट्रीय शैक्षिक अनुसंधान और प्रशिक्षण परिषद नई दिल्ली।
- सृजन–1, राष्ट्रीय शैक्षिक अनुसंधान और प्रशिक्षण परिषद, नई दिल्ली।
- *शब्दों की भाषा और अवधारणा एक निर्देशिका*, कृष्णकुमार, एनबीटी, नईदिल्ली
- पटनायक डी पी. (1981). *मैक्लटीलिंग्विस्टिक्स एडवर्सलैन्ग्वेज एजुकेशनकुलदल्ली* ऑक्सफोर्ड यूनिवर्सिटीप्रेस।
- श्रीवास्तव, आर.एन. 1984 (सपादक), *भाषा शास्त्र के सूत्रधार*, नईदिल्ली नेशनल पब्लिशिंग हाउस।
- शिक्षा मंत्रालय, शिक्षा आयोग कोठारी कमीशन 1964–1966.
- *शिक्षा एवं राष्ट्रीय विकास*, शिक्षा मंत्रालय, भारतसरकार 1966।
- शर्मा, ह (2017). *हिन्दी शिक्षण*. नई दिल्ली. एक्सपर्ट पब्लिकेशन।
- चौहान, आर. (2017) *हिन्दी शिक्षण*, नई दिल्ली : जेनरिक पब्लिकेशन।

## PEDAGOGY OF ENGLISH
## COURSE CODE -SOE020211C3104

**Year: I** **Credits: 4**
**Semester: II** **Max Marks: 100**

**Essence of the Course**

This course is designed to enrich the prospective teachers in terms of their understanding of the functions, importance, linguistic principles and other important aspects of the English language and its teaching in India. It aims at, apart from enriching already existing knowledge of the students about the subject, developing their pedagogical competencies for teaching of English.

**Objectives:** Present course aims to develop among prospective teachers:

- an understanding of the Concept, Nature and Functions of Language.
- comprehension of importance of English in a multilingual society.
- ability to critically explain and adopt various teaching methods and approaches as per their suitability to the content to be taught.
- skill to design and develop effective lesson-plans for various genres such as Poetry, Prose, Fiction etc.
- skill to develop and use teaching-aids in the classroom both in the print and audio-visual formats.
- ability to develop and incorporate teaching skills for effective teaching and learning
- efficiency of developing and using resources like the Language Lab and ICT-enabled Smart class-room
- ability to harness basic language skills among learners.
- a metacognitive awareness of teaching and learning of the English language.
- an understanding of the process of language-assessment
- ability to organize remedial teaching.

| Teaching Scheme (session)* | | | Total (L+T+P) | Examination Scheme | | |
|---|---|---|---|---|---|---|
| | | | | Internal Assessment | External Assessment | Total Marks |
| Unit | L | T/P | C | | | |
| I | 12 | 1 | 13 | 30 Marks | 70 Marks | 100 Marks |
| II | 18 | 1 | 19 | | | |
| III | 18 | 2 | 20 | | | |
| IV | 12 | 1 | 13 | | | |
| Total | 60 | 5 | 65 | 30 Marks | 70 Marks | 100 Marks |
| L=Lecture, T=Tutorial, P=Prcticum | | | | | | |

**Course Content:**

**Unit I: An Overview of specificities of the English Language and its importance**

- Concept, Nature, Functions and Importance of English language.
- Linguistic characteristics of English- Features of English Pronunciation, Elementary knowledge of English sounds, Stress, Rhythm, Intonation and their Implications
- Basic Language Skills: Listening, Speaking, Reading and Writing.
- Aims and Objectives of Teaching English at secondary level.

**Unit II: Approaches and Methods to Teaching of English**

- Difference between 'Approach' and 'Method'
- Inductive and Deductive Approach
- Multilingual Approach
- Whole Language Approach
- Structural Approach
- Communicative Approach,
- Constructivist Approach
- Grammar Translation Method,
- Direct Method,
- Bi-lingual method

**Unit III: Materials of Teaching English, Lesson Planning and Evaluation**

- Teaching of Prose, Poetry, Composition and Grammar.
- Lesson Plan for different genres based on the Bloom's taxonomy.
- Steps of designing a lesson-plan in English for power-point and multimedia applications.
- Teaching Learning Materials and Aids- Print media; other reading materials such as learner-chosen texts, newspapers, class libraries, ICT – audio-visual aids including CALL programmes.
- Concept of unit test, construction of objective type test and online testing.
- CCE (Continuous and Comprehensive Evaluation), its meaning and importance, Assessment formats (Formative assessment, Summative Assessment).

**Unit IV: Basic Teaching Skills, Activities for Language Acquisition and Evaluation**

- Basic Teaching Skills: Skills of Introduction, Explanation, Probing question, Illustration with examples, Stimulus Variation, Using Writing Board and Reinforcement.
- Importance of Planning co-curricular activities- Discussions, Debates, Speech, Language Games, Workshops, Seminars.
- Importance of Role Play, Simulations, Language Laboratories and Smart classrooms.
- Concept and importance of Action Research for effective teaching.
- Meaning, significance and strategies of Remedial Teaching.

**Transactional Strategies:**

**Unit I:** Lecture, Discussion, Debates, Games, Exercises, Use of audio-visual materials, Exposition, Reading demonstration, Games, Exercise, pause short and long lecture, e-learning etc.

**Unit II:** Lecture, Discussion, Discussion-cum-Demonstration, Multimedia lessons, Assignments, Reading practice, audio- feedback, listening etc.

**Unit III:** Lecture, Discussion, Excursion, Games, Exercises, Use of audio-visual materials, Exposition, Demonstration, Games, Exercise, pause short and long lecture, e-learning, Field visits etc.

**Unit IV:** Lecture, Discussion, Excursion, Discussion-cum-Demonstration, Multimedia lessons, Assignments, practice, audio- feedback, listening etc.

**Evaluation Strategy:** (70 External+ 30 Internal)

Term end exam will be of 70 marks.Division of 30 marks of internal assessment will be done as mentioned below.

**Internal Assessment**

| S. No. | Activity | Mode | Weightage of Marks |
|---|---|---|---|
| 1 | Two Sessional tests (Better one will be considered) | Written Test | 10 |
| 2 | Preparation and presentation of a lesson plan and other given assignments+ Practicum | Written as well as multimedia presentation | 10+5 |
| 3 | Percentage of attendance | - | 5 |
| | **Total Marks** | | 30 |

**Practicum – Suggestive List**

1) Planning and presentation of lesson plan on any topic demonstrating all the major teaching skills.

2) Record of any event organized in schools to develop reading, writing, speaking and listening skills through extempore, declamation, discussion etc.
3) Construction of objective type test items of different types.
4) Presentation of Action Research on any problem encountered during English language teaching.

**Suggested Readings:**


- Agnihotri, R.K., Khanna, A.L. (1994) (eds.). *Second language acquisition: Socio-cultural and linguistic aspects of english in india* (RAL1). New Delhi: Sage Publications.
- Allen, V.F. 1965. *On teaching english to speakers of other languages. champaign. Ill*: National Council of Teachers of English.
- Applebee, A.N. (1974). *Tradition and reform in the teaching of english: A history*. Urbana, Ill.: National Council of Teachers of English.
- Bright, J.A., and McGregor, G.P. (1970). *Teaching English as a second language*. ELBS: Longman.
- Brown, H.D. (1993). *Principles of language learning and teaching* (3rd ed.). Englewood Cliffs, N.J.: Prentice Hall
- Browne, A. (1998). *A practical guide to teaching reading in the early years*. London: Chapman.
- Brumfit. C (1984); *Communicative methods in language teaching;* Cambridge University press: Cambridge.
- *Continuous comprehensive evaluation* (2015). Exemplar Package for Upper Primary Stage in English, National Council of Educational Research and Training, New Delhi.
- Cummins, J. and Swain, M. (1986). *Bilingualism in education*. London: Longman.
- Darian, S.G. (1972). *English as a foreign language: History, development and methods of teaching*. Norman : University of Oklahama Press.
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- Nagaraj, G. (1996). *English language teaching approaches, methods and techniques*. Calcutta: Orient Longman.
- National Curriculum Framework (2005). NCERT, December 2005.
- National Curriculum Framework (2005); Position Paper, National Focus Group on Teaching of English; NCERT (2006). Orient Longman, New Delhi
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- https://books.google.co.in/books?id=RIaeh-xeCzEC&pg=PR4&lpg=PR4&dq=The+Teaching+of+English+in+India+H.Wyatt&source=bl&ots=7rwEw3K6fa&sig=FYFSrJr8GpLEgFNMU4UeRR9N0cs&hl=en&sa=X&ved=0ahUKEwjKj_m38J_UAhWLQY8KHTGJBrEQ6AEIKDAC#v=onepage&q=The%20Teaching%20of%20English%20in%20India%20H.Wyatt&f=false
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- Willis, J. (1981). *Teaching English through English ELBS*. England: Longman Ltd.
- Yule, G. (1985). "*The study of language*". Cambridge: Cambridge University Press.


**Web Resources :**


- https://books.google.co.in/books?id=HrhkAwAAQBAJ&lpg=PR1&ots=_LeBso7khd&dq=latest%20approaches%20and%20methods%20of%20teaching%20english&lr&pg=PA3#v=onepage&q=latest%20approaches%20and%20methods%20of%20teaching%20english&f=false
- https://books.google.co.in/books?id=VxnGXusQII8C&lpg=PR7&ots=qhsplbbygN&dq=latest%20approaches%20and%20methods%20of%20teaching%20english&lr&pg=PR7#v=onepage&q=latest%20approaches%20and%20methods%20of%20teaching%20english&f=false
- <iframeframeborder="0" scrolling="no" style="border:0px" src="https://books.google.co.in/books?id=VxnGXusQII8C&lpg=PR7&ots=qhsplbbygN&dq=latest%20approaches%20and%20methods%20of%20teaching%20english&lr&pg=PR7&output=embed" width=500 height=500></iframe>
- https://www.cambridge.org/id/cambridgeenglish/catalog/teacher-training-development-and-research/cambridge-guide-learning-english-second-language/cambridge-guide-learning-english-second-language-apple-ibook-google-ebook-kindle-ebook-ebookscom-ebook?format=36&isbn=9781108408455
- https://www.cambridge.org/id/cambridgeenglish/catalog/teacher-training-development-and-research/teaching-and-developing-reading-skills?format=41&isbn=9781316647370
- https://www.cambridge.org/id/cambridgeenglish/catalog/teacher-training-development-and-research/teaching-and-developing-reading-skills?format=ET&isbn=9781316647349
- https://play.google.com/store/apps/details?id=com.gutenbergtechnology.cupcambridge.bookshelf
- https://www.cambridge.org/id/cambridgeenglish/catalog/grammar-vocabulary-and-pronunciation/english-grammar-use-4th-edition/product-details/cambridge-lms
- https://www.cambridge.org/id/cambridgeenglish/catalog/grammar-vocabulary-and-pronunciation/academic-vocabulary-use-2nd-edition/academic-vocabulary-use-2nd-edition-edition-answers/resources
- https://www.cambridge.org/cambridgeenglish/catalog/skills/final-draft/resources
- https://www.cambridge.org/cambridgeenglish/catalog/grammar-vocabulary-and-pronunciation/english-grammar-use-4th-edition/resources

## PEDAGOGY OF SOCIAL SCIENCE
## COURSE CODE: SOE020212C3104

**Year: I** **Credit: 4**

**Semester: II** **Max Marks: 100**

**Essence of the Course**

This course will enable the students to develop deeper understanding about the structure and functions of the society. Accordingly, they shall be in a position to appreciate the foundations on which societies have developed. Such an understanding will help a student teacher to organize one's teaching keeping in view the background of students. Also, he/she will be able to organize various programmes to develop a sense of appreciation about the rich cultural heritage among the students.

**Objectives:** This course will enable the student-teachers to :

- explain the concept, nature and importance of Social Science.
- appreciate the importance of teaching of Social Science at the Secondary School level.
- apply the methods and approaches for organizing Social Studies curriculum..
- develop skills to teach and evaluate Social Science.
- equip the student trainees with the skills of diagnostic and remedial teaching.
- equip the student trainees with the skills for teaching gifted and under average students.
- critically examine the Social Science syllabus and develop skills to periodically modify and update the text books.

| Teaching Scheme (session)* | | | Total (L+T+P) | Examination Scheme | | |
|---|---|---|---|---|---|---|
| | | | | Internal Assessment | External Assessment | Total Marks |
| Unit | L | T/P | C | | | |
| I | 12 | 4 | 16 | 30 Marks | 70 Marks | 100 Marks |
| II | 12 | 4 | 16 | | | |
| III | 12 | 4 | 16 | | | |
| IV | 12 | 4 | 16 | | | |
| Total | 48 | 16 | 64 | **30 Marks** | **70 Marks** | **100 Marks** |
| L=Lecture, T=Tutorial, P=Pricticum | | | | | | |

**Course Content:**

**Unit I: Conceptual understanding, aims and objectives of Social Science**

- Concept, Need and Importance of Social Science
- Nature and Scope of Social Science and Place of Social Science in school curriculum
- Aims & Objectives Teaching of Social Science
- Bloom taxonomy

**Unit II: Methods, Planning and Instructional aids of Teaching Social Science**

- Narration cum discussion, role-play, Project method, Problem solving, storytelling, Source method (meaning, uses and limitations)
- Unit Plan: objective, needs and importance
- Lesson plan : objective, needs and importance
- Teaching Aids: Audio, Visual and Audio-visual (meaning, use, merit and limitation)

**Unit III: Basic teaching skills, Teacher, Resource center and Text book of teaching social science**

- Teaching skills : introductory, reinforcement, writing board, stimulus variation, probing questioning and Illustration with example
- Characteristics and qualities of Social Science teacher
- Need, importance and arrangement of Social Science Resource centre
- Text book: Characteristics of good text book, analysis of text book in Social Science

**Unit IV: Evaluation in Teaching Social Science**

- Meaning of evaluation and examination
- Tools of evaluation in social science (Check list, observation, interview)
- Types of test (Meaning, Construction, Merit, Limitation)
- Concept, Need and importance of diagnostic and remedial work in social science

**Transactional Strategies**

Lecture-cum-discussion along with interactive group discussion, field trips, group discussions, brainstorming and simulation in the form of mock session, Bal Panchayat etc.

**Internal Assessment Strategies**

A total of thirty marks have been allotted under Internal Assessment. The nature of the activity, mode and weightage of marks are as follows.

| S.No. | Activity | Mode | Weightage of Marks |
|---|---|---|---|
| 1 | Two Sessional tests will be conducted (Best two will be considered) | Test | 10 |
| 2 | Preparation of an assignment on various topics and it is followed by presentation in the classroom (Group activity) & Practicum | Assignment & Presentation (PPT) | 05+10 |
| 3 | Percentage of attendance | | 05 |
| **Total Marks** | | | **30** |

**Practicum – Suggestive List**

Arrange any two activity : each out of the following two groups:

1) **Educational visit:**
   - (i) Historical places
   - (ii) Ecological places
   - (iii) Political places

2) **Organisaton of Programme**
   - (i) Social Awareness
   - (ii) Election Awareness
   - (iii) Exhibition
   - (iv) Preparation of Annual Plan, Unit Plan and Lesson Plan
   - (v) Scrapbook

**Suggested Readings**


- Agrawal, J.C.: *Teaching of social studies*. New Delhi : Vikas Publishing House.
- Bhattacharya, S. & Datt:. D.R. (1966). *Teaching of social studies in indian schools*, Baroda : Acharya Book Depot.
- Binning, A.C.: *Teaching social studies in secondary schools*. New York : McGraw Hill and Co.
- Desai, D B.: *Samaj vidyana shikhan*. Ahmedabad: Bal govind Prakashan.
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- Holt, Rinehart and Winston (1967). *Handbook for social studies teaching*.The Association of Teachers of Social Studies .New York: INC
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- Sharma, B.L., & Shukla, A.K. (2018). *Teaching of social science*.Meerut: R. Lal Publication.


**Web Resources**


- http://www.ncert.nic.in/new_ncert/ncert/rightside/links/pdf/focus_group/social_science1.pdf
- http://www.bdu.ac.in/cde/docs/ebooks/B-Ed/I/TEACHING%20%20OF%20SOCIAL%20SCIENCE.pdf
- http://www.ignouhelp.in/ignou-bes-142-study-material/
- http://www.ncert.nic.in/departments/nie/dess/publication/prin_material/ITPD%20Final%20june%2014.pdf
- Learning curves: special issue in social science in schools, (2010), by AzimPremji Foundation http://azimpremjifoundation.org/pdf/LCXV.pdf
- Learning Indicators and Learning Outcomes at the Elementary Stage, (2014), NCERT http://www.ncert.nic.in/departments/nie/dce/publication/pdf/LI_Final_Copy_Revised_29.12.14.pdf

## PEDAGOGY OF MATHEMATICS
## COURSE CODE -SOE020213C3104

**Year:** I
**Semester:** II

**Credit:** 4
**Max Marks:** 100

**Essence of the Course**

This course aims at developing advanced level understanding of mathematics subject and its pedagogy. This course focuses on preparing student-teachers in a manner that will help them to tackle day today mathematical problems. For providing students with pedagogical content knowledge different methods, approaches, strategies of teaching mathematics have been included. This course on teaching of mathematics will help student-teachers understand key concepts of mathematics as well as methods and procedure of teaching mathematics effectively and efficiently.

**Objectives:** After completing this course, the student-teachers will be able to:

- develop insight into the meaning, nature, scope and objective of mathematics education
- appreciate the role of mathematics in day-to-day life
- select appropriate methods of teaching mathematics at secondary level
- select appropriate teaching strategies of teaching mathematics at elementary and secondary level
- analyse the content scientifically
- explore new strategies to plan lesson
- plan their lesson to connect life outside the school
- construct appropriate assessment tools for evaluating mathematics learning
- apply a variety of assessment techniques and practices by formal or informal ways

| Teaching Scheme (session)* | | | | Total (L+T+P) | Examination Scheme | | |
|---|---|---|---|---|---|---|---|
| | | | | | Internal Assessment | External Assessment | Total Marks |
| Unit | L | T | P | C | | | |
| I | 12 | 4 | 0 | 16 | 30 Marks | 70 Marks | 100 Marks |
| II | 8 | 2 | 6 | 16 | | | |
| III | 10 | 2 | 4 | 16 | | | |
| IV | 10 | 2 | 4 | 16 | | | |
| Total | 48 | 16 | 14 | 64 | 30 Marks | 70 Marks | 100 Marks |
| L= Lecture, T=Tutorial, P=Practicum | | | | | | | |

**Course Content:**

**Unit I: Mathematics as a School subject**

- Meaning, Nature, Scope and Significance of teaching mathematics
- Meaning and building blocks of mathematics-undefined terms, definitions, axioms, postulates
- Correlation of Mathematics with other school subjects
- Contribution of Great mathematicians(Aryabhatta, Bhaskaracharya, Ramanujan, Brahmgupta, Pythagores)
- Position Paper of National Focus Group on Mathematics(NCF2005)

**Unit II: Aims, Objectives and Skills of teaching Mathematics**

- Aims and Objectives of teaching mathematics
- Bloom's Taxonomy of Instructional Objectives
- Approaches of Formulation of instructional objectives in Behavioural Term: Robert Mager's, Robert Miller's RCEM(Regional College of Education Mysore)
- Basic Skills of Teaching Mathematics: Introducing the Lesson, Probing Question, Explanation, Illustration with Examples, Stimulus Variation, Board Writing

**Unit III: Methods, Techniques and Resources of Teaching of Mathematics**

- Difference between Methods & Techniques
- Methods of Teaching Mathematics: Inductive- Deductive Method, Analytic –Synthetic Method, Lecture Cum Demonstration Method, Laboratory Method, Activity Based Method, Project Method, Problem Solving Method
- Techniques of Teaching Mathematics: Oral, Written, Assignment, Drill & Homework
- Mathematics Text Book, Mathematics Labs, Mathematics Club, Mathematics Library, ICT equipped classroom, Mathematics Learning Software, Audio- Visual Aids

**Unit IV: Planning & Evaluation**

- Planning: Yearly, Unit and Lesson
- Meaning, Need and Importance, Qualities of Good Lesson Plan
- Approaches of Lesson planning: Herbertian and Constructivist
- Evaluation
- Formative and Summative Evaluation,
- Continuous and Comprehensive Evaluation,

- Tools and Techniques of Evaluation
- Construction of An Achievement Test with Blue Print

**Transactional Strategies**

**Unit I:** Lecture followed by discussion supplemented by searches on MOOC's and augmented by power- point presentation

**Unit II:** Lectures, discussions, Lecture cum demonstration,

**Unit III:** Lecture cum Discussion should follow around readings. Students should be given hands on experiences and appropriate illustrations be made around methods and strategies. Visit to mathematics library and laboratory and hands on experience to students, e-platforms, library assignment. Critical analysis of the school text book and syllabus will be made.

**Unit IV:** Lecture cum Discussion should follow around readings. Demonstration of lesson planning on innovative approaches. Power Point Presentation on different types of evaluation, hand on activity on Making Blue print of Achievement Test

**Internal Assessment Strategies:** A total of thirty marks have been allotted under Internal Assessment. The nature of the activity, mode and weightage of marks are as follows.

| S. No. | Activity | Mode | Weightage of Marks |
|---|---|---|---|
| 1 | Two Sessional tests will be conducted (Better one will be counted) | Test | 10 |
| 2 | Preparation of an assignment on various topics and it is followed by presentation in the classroom **(Group activity) + Practicum** | Assignment & Presentation (PPT) | 05-10 |
| 3 | Percentage of attendance | --- | 05 |
| **Total Marks** | | | 30 |

**Practicum:** Practical/Assignment Suggestive List:

- Content Analysis of Position paper of National Focus Group on Teaching of Mathematics
- Prepare a report about contribution of Indian Mathematicians Mathematics.
- Critically Review of Mathematics Text book and make a report
- Observation of children doing everyday Maths, community numeracy practices and make a report.
- Development and trying out of Teaching-learning strategy for teaching of particular Mathematical concepts.
- Construction of Mathematical Working and Non-Working 2D and 3D Models
- Development and use of Mathematics laboratory.
- Organizing a 'Mathmela' in a school or a locality and write a report
- Lesson Plan on one topic from secondary school mathematics
- Construction of an achievement test with blue prim
- PP Presentation on give topic of syllabus.

**Suggested Readings:**


- Aniee, J. (2008). *Methods of teaching mathematics*. New Delhi: Neelkamal Publications.
- Butler, C.H., Wren, F.L., & Banks, J.H. (1971). *The teaching of Secondary Mathematics*. New York: McGraw Hill.
- Coney, T.J., Davis, G.J., & HenDerson, K.B. (1975). *Dynamics of teaching secondary school mathematics*. Boston: Houghton-Mifflin Co.
- Ediger, M., & Rao, B. (2000). *Teaching mathematics successfully*. New Delhi: Discovery Publishing House.
- Kidd, P.K., Myers, S.S. & Cilley David, M. (1970). *The laboratory approach to mathematics*. Chicago: Science Research Associates Inc.
- Kinney, L.B., & Purdy, C.R. (1965). *Teaching of mathematics in secondary school*. New York; Holt, Rinehart and Winston.
- Kolb, J.R., & Bassler, O.C. (1979). *Learning to teach secondary school mathematics*. London: In text Educational Pub.
- Kothari, R.G., & Mistry, H.S. (2012). *Diagnosis of learning difficulties on fractions and decimals: A study on the students of upper primary schools*. Germany: Lambert Academic Publishers.
- Kothari, R.G., and Shelat, P.H. (2011). *Mathematical weaknesses among secondary school students*. Germany: VDM Verlag Publishers.
- Kulshrestha, A.K.(ed.) (2016). *Pedagogy of school subject mathematics*. Meerut: R.Lall Publishing house.
- Kumar, S. (1993). *Teaching of mathematics*. New Delhi: Anmol Pub. Pvt.
- Mason J. H.(2016). *Mathematics teaching practice*. New Delhi: Elsevier Science & Technology.
- Mottershead, L. (1978). *Sources of mathematical discovery*. Oxford. Basil black Wall.
- NCERT (2006). *Position paper-National focus group on teaching of Mathematics*. New Delhi: NCERT.
- NCERT (2012).*Pedagogy of mathematics.New Delhi: NCERT.*
- Nickson, M. (2006). *Teaching and learning mathematics: A guide to recent research and its application*. London: Continuum.
- Pandya, B. (2007). *Teaching of mathematics*. Agra: Radha Prakashan Mandir.
- Paul, C. (2008). *Teaching mathematics. Developing as a reflective secondary Teacher*. New Delhi: Sage Publication.
- Rao, N.M. (2007). *A manual of mathematics laboratory*. New Delhi: Neelkamal Publications.
- Rock, D. & Brambhaug, D.K (2013). *Teaching secondary mathematics*. Revised ed. Noida: Vikas Publishing House Pvt. ltd.
- Reeve, W.D. (1954). *Mathematics for the secondary school*. New York: Holt. Rinehart and Winston. Inc.
- Russel, J. (2007). *Teaching of mathematics*. New Delhi. Campus Books International.
- Servais, W. & Varga, T. (ed.) (1971). *Teaching school mathematics. A UNESCO Source Book*. UNESCO. Penguin books.
- Shah G.B. (1964). *New dimensions in teaching of Mathematics*. Baroda: CASE.
- Sidhu, K.B. (1974). *The teaching of mathematics*. New Delhi: Sterling Pub. (p). Ltd. (I.B 1646 '4 54)
- Singh, H., Avtar, R. & Singh, V.P. (2008). *A handbook for designing Mathematics*.New Delhi: APH Publishing House.
- Siddiqui, M.H. (2009). *Teaching of mathematics*. New Delhi: APH Publishing House.
- Upadhyay, R. (2014).*Teaching of mathematics*. Meerut. R.Lall Publication.

**Web Resources**

- https://www.youtube.com/watch?v=hbDkSaSnbVM
- https://www.youtube.com/watch?v=lO19-MTwThI
- https://www.youtube.com/watch?v=MrIdc-Hs-is
- https://www.youtube.com/watch?v=lhwAMhZQ6kU
- http://mathigon.org/resources/value-of-mathematics.pd
- http://mathedu.hbcse.tifr.res.in (Unit 3)
- http://www.ncert.nic.in/departments/nie/dee/publication/pdf/CCE_Math.pdf
- http://www.ncert.nic.in/departments/nie/niew/school_kits/kit_manuals.html
- http://nrich.maths.org
- http://www.slideshare.net/MiraculeDanielGavor/ict-tools-in-mathematics-instruction
- http://www.arvindguptatoys.com/math-magic.php
- http://karnatakaeducation.org.in/KOER/en/index.php/Portal:Mathematics
- http://www.mathcelebration.com/index.html
- http://map.mathshell.org
- http://www.cimt.plymouth.ac.uk/projects/mep/default.htm
- http://mathbits.com
- http://www.math-play.com
- http://www.geogebra.org
- http://classroom-aid.com/educational-resources/mathematics
- http://etc.usf.edu/math
- http://mathworld.wolfram.com
- https://www.merlot.org/merlot/materials.htm?category=2513
- https://www.khanacademy.org
- http://www.learner.org/resources/browse.html?d=5
- https://blossoms.mit.edu/resources/math_resources
- https://currikicdn.s3-us-west-2.amazonaws.com/resourcefiles/54d2dd15bb67b.pdf
- Teaching of Mathematics, NCERT http://www.ncert.nic.in/departments/nie/dse/activities/advisory_board/PDF/teaching_maths.pdf
- http://www.epathshala.co.in/

## PEDAGOGY OF LIFE SCIENCE
## COURSE CODE:SOE020214C3104

**Year: I** **Credit: 4**

**Semester: II** **Max Marks: 100 Marks**

**Essence of the Course Content**

This course covers the content areas which develop comprehension and familiarity about different concepts like educational objectives,teaching methods, basic teaching skills, instructional aids, resources, life science laboratory and different co-curricular activities used in life science so that pupil teachers would be able to apply the knowledge to keep their students on task and engaged in their classroom. The role and responsibilities of life science teachers have also included in this course so that the pupil teachers would be able to develop necessary qualities to perform their duties during their internship and in their profession. This course will enable the student teachers in planning, organizing, managing the classroom interactive.

**Objectives :** after completing tis course, the student teachers will be able to :

- develop a comprehensive understanding about the pedagogy of life science.
- describe the concept, nature, aims and objectives of teaching of life science.
- articulate various teaching methods and skills used in teaching of life science and they will apply them making their teaching effective.
- construct lesson plan based on various skills.
- write instructional objectives in behavioral terms
- acquire skill in constructing blueprint.
- familiarize with the learning resources and instructional aids.
- acquaint the importance of evaluation and assessment in pedagogy of life science.

| Teaching Scheme (session)* | | | Total (L+T+P) | Examination Scheme | | |
|---|---|---|---|---|---|---|
| | | | | Internal Assessment | External Assessment | Total Marks |
| Unit | L | T/P | C | | | |
| I | 12 | 4 | 16 | 30 Marks | 70 Marks | 100 Marks |
| II | 12 | 4 | 16 | | | |
| III | 12 | 4 | 16 | | | |
| IV | 12 | 4 | 16 | | | |
| Total | 48 | 16 | 64 | 30 Marks | 70 Marks | 100 Marks |
| L=Lecture, T=Tutorial, P=Practicum | | | | | | |

**Course Content**

**Unit I: Conceptual understanding of pedagogy of Life Science**

- Concept, Nature, importance and Scope of Life Science.
- Various branches related to Life Science: Mathematics, Geography, Chemistry, Physics, Statistics, Language, Social Science
- Aims and Objectives of teaching of Life Science at Primary, Secondary and Senior Secondary.
- Bloom's Taxonomy of Educational Objectives: Traditional and Revised.
- Writing Instructional Objectives: RCEM approach, Robert Magar and Robert Miller.

**Unit II: Basic Teaching Skills, Methods and Lesson Planning**

- Basic Teaching skill: Meaning, and components of various teaching skills: (Introducing the Lesson, Reinforcement Skill, Questioning, Explaining, Illustration with Example, Board Writing, Stimulus Various Skill)
- Methods of Teaching: Lecture Method, Demonstration Method, Laboratory Method, Project Method, Heuristic Method, Constructivist Method: constructivism, 5 E's of Constructivism, Constructivist classroom and teacher.
- Lesson Plan: Meaning, Concept, importance and construction (Constructivist Approach)

**Unit III: Co-curricular Activities, Learning Resources and Instructional Aids and life science teacher**

- Co-curricular activities and Learning Resources: Science Club, Science Exhibition, Science fair, Science Museum, Field Trip, text book, internet, aquarium, vivarium and Herbarium.,
- Instructional Aids: Meaning, Concept, Importance and types (Audio, Visual and Audio-Visuals).
- Science Laboratory and Practical Work: Planning, organization and Equipping, Safety measures and importance of practical work.
- Role, duties and qualities of life science teacher.

**Unit IV: Assessment and Evaluation in Life science**

- Assessment and Evaluation, Meaning, Concept, importance and types (Formative and Summative)
- Devices and Techniques of Evaluation in Life Science.
- Blueprint and Test: Definition, characteristics of good test, Types (Achievement Test, Teacher made & Diagnostic) of test and test items and importance.
- Assessment of Practical Work in life Science.
- Action Research: Meaning, steps and importance.

**Transactional strategies**

Lecture cum discussion, Lecture cum demonstration, Use of PPT, Assignments on various topics, Presentation and discussion, Debate and presentations by Pupil Teachers will be encouraged.

**Internal Assessment**

A total of thirty marks have been allotted under Internal Assessment. The nature of the activity, mode and weightage of marks are as follows.

| S. No. | Activity | Mode | Weightage of Marks |
|---|---|---|---|
| 1 | Two sessional tests will be conducted (Best one will be considered). | Test | 10 |
| 2 | Assignment + Practicum | Assignment & Presentation (PPT) | 5+10 |
| 3 | Percentage of attendance | --- | 05 |
| **Total Marks** | | | **30** |

**Practicum –** Suggestive List

1) Presentation of lesson plan using various basic teaching skills
2) Visit nearby 5 school and prepare a report on Science Laboratory.
3) Critical analysis of a test paper of Biological Science.
4) Critical review of a text book of science
5) Planning and conducting experiments of science/Biology
6) Storage of chemicals and specimens.
7) Safety measures being taken in the science laboratories and steps taken by student teachers.
8) Construction of blueprint.

**Suggestive Readings:**


- Abraham, J., & Reiss, M. (2016). *Enhancing learning with effective practical science* (1st ed.). London: Bloomsbury Publishing House.
- Agarwal, K. P., & Bain M. P. (2019). *Powerful teaching: unleash the science of learning*. New Jersey: Wiley publishing House
- Ahmad, J. (2014). *Teaching of biological science*. Delhi: PHI Learning Private Limited
- Amit (2002). *Teaching of physical sciences*. New Delhi. Anmol Publications
- Gupta, S.K. (1985). *Teaching of physical science in secondary schools*. New Delhi: Sterling Publications (Pvt.) Limited.
- Keith, S. T. (2018). *Master class in science teaching* (1st ed.). London: Bloomsbury Publishing House.
- Kochhar, S.K. (2003). *Methods and techniques of teaching*. Sterling Publishers Pvt Limited.
- Kohli, V.K. (1998): *How to teach science*. Ambala: Vivek Publishers.
- Kulshreshta, S.P. & Singh, G. (2013). *Teaching of physical science*. Meerut, R. Lal Book Depot.

- Kulshrestha, S. K. (2007). *Teaching of science*. New Delhi: Lotus Press.
- Kumar.R. & Kumar (2000). *Teaching of science*. Mangal Deep Publication.
- Kumar. P & Ramaiah. K. & Sreedharacharyulu. K. (2016). *Pedagogy of physical science*. New Delhi. Neelkamal Publication.
- Laxmi. G. B.& Rao. Bhaskara (2004). *Methods of teaching life Science*. New Delhi: Neelkamal Publication.
- Mangal, S.K. (1997). *Teaching of life science*. New Delhi.Discovery Publishing House.
- Nagaraju, M.T. V& Vanaja. M. (2015). *Methods of teaching of physical science*. New Delhi. Neel Kamal Publications.
- Pahuja. S. & Ravikant. (2016). *Pedagogy of school subject biological science*. New Delhi: Neel Kamal Publication.
- Pedagogy of Biological Science. (2015). Retrieved from http://www.senthilcollegeedu.com/Pedagogy%20of%20Biological%20Science.pdf
- Position Paper on Teaching of Science. (2006). Retrieved from http://epathshala.nic.in/wp-content/doc/NCF/Pdf/science.pdf
- Pandey (2003). *Major issues in science teaching*. New Delhi: Sumit Publications.
- Prasad Janardan. (1999). *Practical aspects in teaching of science*. New Delhi: R. Lall Publication
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- Sharma. R.C. (2006). *Modern science teaching*. New Delhi: Dhanpat Rai Publishing Comp.
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- Sood. J.K. (1992). *New directions in science teaching*. Chandigarh: Kohli Publishers.
- Shankar. T. (2007). *Methods of teaching life science*. Delhi. Crescent Publishing Corporation
- Teaching of Science(n.d.). Retrieved from http://www.ncert.nic.in/departments/nic/dse/activities/advisory_board/PDF/teaching_sc.pdf

**Web Resources:**

- http://www.ncert.nic.in/new_ncert/ncert/rightside/links/pdf/focus_group/science.pdf Retrieved November 16, 2018
- http://www.ncert.nic.in/rightside/links/pdf/h_focus_group/Vigyan%20Shikshan.pdf Retrieved November 16, 2018
- http://www.ncert.nic.in/new_ncert/ncert/rightside/links/pdf/focus_group/aims_of_education.pdf Retrieved November 16, 2018
- http://www.ncert.nic.in/departments/nie/desm/publication/pdf/basic_in_education.pdf Retrieved November 16, 2018
- http://www.ncert.nic.in/departments/nie/desm/publication/pdf/phy_sci_partI.pdf Retrieved November 16, 2018
- http://www.ncert.nic.in/departments/nie/desm/publication/pdf/phy_sci_PartII.pdf Retrieved November 16, 2018
- http://www.ncert.nic.in/departments/nie/niew/school_kits/secondary_level/pdf/Manual_Sci_KitClass%20IX%20&%20X.pdf Retrieved November 16, 2018
- http://www.ncert.nic.in/departments/nie/niew/school_kits/upper_prm_level/pdf/LMUPS_Science.pdf Retrieved November 16, 2018
- https://ignou.devsamaj.org/wp-content/uploads/2018/05/BES-141-BLOCK-23.pdf Retrieved November 20, 2018
- http://dlce.nkal.ac.in/Syllabus/MA_Education/Education_Paper_5_SCIENCE.pdf Retrieved November 20, 2018




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- http://www.ncert.nic.in/departments/nie/dse/deptt/activities/pdfs/Chapter_5.pdf Retrieved November 20, 2018
- http://www.cbse.nic.in/cce/cce-manual/CBSE-FA-Class-IX%20%28Science%29%20Final.pdf Retrieved November 20, 2018
- http://www.icbse.com/cce/formative-assessment Retrieved November 20, 2018
- http://cbse.nic.in/cenbosec/oct-dec-2009/31-40.pdf Retrieved November 20, 2018
- http://www.cbse.nic.in/publications/CCE_Manual_Class_VI_VII_2010.pdf Retrieved November 20, 2018
- http://www.cbse.nic.in/cce/cce-manual/chapter_1.pdf Retrieved November 20, 2018
- http://www.ncte.org/library/NCTEFiles/Resources/Positions/formative-assessment_single.pdf Retrieved November 20, 2018
- https://www.ucd.ie/t4cms/UCDTLT0029.pdf Retrieved November 20, 2018
- https://www.ijser.org/researchpaper/The-Use-of-Laboratory-Method-in-Teaching-Secondary-School-Students-a-key-to-Improving-the-Quality-of-Education.pdf Retrieved November 20, 2018

## PEDAGOGY OF PHYSICAL SCIENCE
## COURSE CODE: SOE020215C3104

**Year: I**
**Semester: II**

**Credit: 4**
**Max Marks: 100 Marks**

**Essence of the Course**

This course will enable the 'would be teachers' to know why and how to teach Physical Science to students. Pupil teachers will be able to know about the teaching methodology of physical Science. They will know the importance of teaching Physical Science with the help of different methods. Pupil teachets will know about the aims and objectives of teaching Physical Science. They will know the importance of teaching aids, microteaching skill and lesson plan for teaching Physical Science.

**Objectives:** After completing this course, the student teachers will be able to :

- familiarize with concept and nature of physical science.
- acquaint with the importance of teaching of physical science.
- develop scientific thinking in themselves, students and communities
- prepare a lesson plan
- familiarize with the learning resources and instructional aids
- describe the importance of educational technology for teaching physical science
- learn the methods and pedagogical analysis of teaching physical science.

| Teaching Scheme (session)* | | | Total (L+T+P) | Examination Scheme | | |
|---|---|---|---|---|---|---|
| | | | | Internal Assessment | External Assessment | Total Marks |
| Unit | L | T/P | C | | | |
| I | 12 | 4 | 16 | 30 Marks | 70 Marks | 100 Marks |
| II | 12 | 4 | 16 | | | |
| III | 12 | 4 | 16 | | | |
| IV | 12 | 4 | 16 | | | |
| Total | 48 | 16 | 64 | 30 Marks | 70 Marks | 100 Marks |
| L=Lecture, T=Tutorial, P=Pricticum | | | | | | |

**Course Content:**

**Unit I: Conceptual Understanding and Objectives of Teaching Physical Science**

- Concept, Nature, Scope and Value of Physical Science as a Subject of the School Curriculum
- Correlation of Science with subjects (Mathematics, Social Studies, Geography, Health & Physical Education).
- Aims and Objectives: Meaning and Difference between the terms. Aims of teaching Physical Sciences at Middle and Secondary level with special reference to NCF 2005
- Bloom's Taxonomy of Educational Objectives (Cognitive, Affective and Psychomotor): Traditional and Revised
- Approaches of writing objectives in behavioral terms: Robert Mager, Miller and RCEM approach

**Unit II: Basic Teaching Skills, Methods and strategies of Teaching Physical Sciences**

- Basic teaching skill: Meaning and Components of Skills (Skill of Introducing the Lesson, Skill of Reinforcement, Skill of Probing Questioning, Skill of Illustration with Example, Skill of Explanation, Skill of Stimulus Variation, Skill of Board Writing, Skill of Classroom Management)
- Methods of Teaching Physical Science: Lecture-Cum Demonstration, Project Method, Laboratory Method, Heuristic Method, Brain Storming
- Strategies of Teaching Physical Science: Team Teaching, Panel Discussion, Field Trips, Science Club, Science Fairs and Exhibition

**Unit III: Pedagogical Analysis, Lesson Planning & Evaluation**

- Pedagogical analysis: Utility, Principles, Steps in Pedagogical Analysis
- Pedagogical analysis of any one of the topic from Science text book from class $6^{th}$ to $10^{th}$ referred by NCERT
- Lesson Plan: Essential features, Advantages, Requirement, Approaches to Lesson Plan: Herbatian Approach, Constructivist Approach
- Evaluation: CCE, meaning and needs, Types, Qualities of a good test, Blue Print
- Action Research: Meaning, Steps and importance

**Unit IV: Instructional material and Teacher of Physical Science**

- Instructional Aids: Meaning, Need, Types (Charts, Models, Display Boards, and Black Board, Computer, Science Kit and their merits & demerits.)
- Improvisation: Meaning, need and importance
- Laboratory: Planning, equipping and organization
- Text book: Meaning, Qualities of a good Science Textbook, Critical Analysis of a Secondary School Physical Science Textbook, Procedure of Textbook selection

- Physical Science Teacher: Qualities and Duties

**Transactional strategies**

Lecture cum discussion. Lecture cum demonstration. Use of PPT. Assignments on various topics. Presentation and discussion. Debate and presentations by Pupil Teachers will be encouraged

**Internal Assessment**

A total of 30 marks have been allotted under Internal Assessment. The nature of the activity, mode and weightage of marks are as follows.

| Sr.No. | Activity | Mode | Weightage of Marks |
|---|---|---|---|
| 1 | Two Sessional will be conducted (Better one will be considered) | Test | 10 |
| 2 | Assignment + Practicum (Lesson Plan Presentation on Any topic of Physical Science From NCERT Science Book From class 6th to 10th by using all (as mentioned in syllabus) basic teaching skills) | Assignment + Lesson Plan Presentation | 5 + 10 |
| 3 | Percentage of attendance | --- | 05 |
| **Total Marks** | | | 30 |

**Practicum – Suggestive List :** Lesson plan presentation on any topic of Physical Science book from Class VI$^{th}$-X$^{th}$ by using all (mentioned in syllabus) basic teaching skills.

**Suggestive Readings:**


- Albert, Paul (2017). *Pedagogy of Physical science*. New Delhi: Blue Rose Publishers
- Kochhar, S.K. (2003) *Methods and techniques of teaching*. New Delhi: Publishers Pvt. Ltd..
- Kohli, V.K. (1998) *How to teach science* Ambala: Vivek Publishers.
- Kulshrestha, S P , Singh, Gaya (2013). *Teaching of physical science*. Meerut: Raj Printers.
- Kumar, Pramod , Ramaiah, K. , Sreedharacharyulu, K (2016). *Pedagogy of Physical Science*. Meerut: R.I all.
- Mangal, S K., Mangal, Shubhra (2018). *Pedagogy of Physical Sciences* Meerut: International Publishing House.
- Nagaraju, M T.V., Vanaja, M. (2015). *Methods of teaching of physical science*. New Delhi: NeelKamal Publications.
- NCT (2005). *National curriculum framework* New Delhi: NCERT.
- NCERT. (2006) *Position paper on teaching of science* New Delhi: NCERT
- Pal, Sangeeta (2016).*Pedagogy of Physical Sciences*. Agra: Rakh Prakashan.
- Pandey. (2003). *Major issues in science teaching*. New Delhi.: Sumit Publications.
- Praveen, Manoj G., Haseen, Kaya M. P. (2016) *Teaching Science Resource, Methods and Practices | Physical Science & Natural*

*Science*. New Delhi: Neelkamal Publishers.

- Radha Mohan. (2016). *Teaching of physical science*. New Delhi: Neelkamal Publishers.
- Rahi, Avtar Singh (2018). *Pedagogy of Physical Sciences and Teachers*. Colorado (U.S.A.): Create space Independent Publishing Platform.
- Rajasekar, S. (2016). *Methods of Teaching Physical Science*. New Delhi: Neelkamal Publishers.
- Rao, N. Venkat, Ramulu, Ch. A. (2016). *Pedagogy of Physical Sciences*. New Delhi: Neelkamal Publishers.
- Sharma, R.C. (2006). *Modern science teaching*. New Delhi: Dhanpat Rai Publishing Comp.
- Shanna, R.P. (2010). *Teaching of physical science*. Meerut: R.Lall.
- Sood, J.K. (1992). *New directions in science teaching*. Chandigarh: Kohli Publishers.
- Tolman, Marvin N. (2006). *Hands on Physical Science Activities*. United States: Jossey Bass (Wiley).

**Web Resources:**

- http://sprabhakngce.blogspot.com/
- http://www.ncert.nic.in/textbook/textbook.htm
- http://www.ncert.nic.in/ncert/textbook
- http://www.ncert.nic.in/rightside/links/pdf/framework/ncf_hindi_2005/ncf2005.pdf
- http://www.ncert.nic.in/rightside/links/pdf/framework/english/nf2005.pdf

## PEDAGOGY OF ECONOMICS

**Course Code: SOE020216C3104**

**Year: I**
**Semester: II**

**Credit :4**
**Max Marks : 100 Marks**

**Essence of the course:**

Economics deals with the broad themes of state, market, and development. Market and state are interrelated as instruments of development. Economics introduces the learners to key economic concepts and issues that affect their everyday lives. After studying this course, Pupil Teachers will be able to organize various programmes to develop an understanding about the state, market, national income, development and other concepts of economics.

**Objectives :** After completing this course, the student teachers will be able to :

- familiarize the pupil teacher with various teaching resources and aids of teaching Economics at the senior secondary level.
- introduce various activities (micro teaching, lesson plan etc) for teaching economics.
- develop competence in use of instructional media in teaching economics
- promote reflection on issues pertaining to teaching of Economics.
- develop competence in designing effective instructional material to teach Economics.
- develop ability to design, develop; and use various tools & techniques of evaluation.
- develop awareness about syllabus prescribed by different State/Central Boards.
- develop competence in preparing Achievement Test Report of Students in Various forms.
- familiarize the pupil teacher with various strategies, methods, techniques and skills of teaching Economics at the senior secondary level.
- introduce various methods, strategies and techniques of teaching economics.
- develop competence in use of appropriate strategy in relation to teaching economics
- promote reflection on issues pertaining to teaching of Economics.
- develop competence in designing effective instructional material to teach Economics.
- develop awareness about syllabus prescribed by different State/Central Boards.
- develop awareness about recent advancements in teaching of Economics.

| Teaching Scheme (session)* | | | Total (L+T+P) | Examination Scheme | | |
|---|---|---|---|---|---|---|
| | | | | Internal Assessment | External Assessment | Total Marks |
| Unit | L | T/P | C | | | |
| I | 12 | 4 | 16 | 30 Marks | 70 Marks | 100 Marks |
| II | 12 | 4 | 16 | | | |
| III | 12 | 4 | 16 | | | |
| IV | 12 | 4 | 16 | | | |
| Total | 48 | 16 | 64 | 30 Marks | 70 Marks | 100 Marks |
| L=Lecture, T=Tutorial, P=Pricticum | | | | | | |

**Course content :**

**Unit 1 :Introduction to Economics as a Discipline**

- Meaning, Nature and Scope of Economics as a Discipline
- Aims and objectives of teaching Economics at secondary and senior secondary school level inclxding Instructional objectives of teaching Economics.
- The Curricular linkages with regard to contemporary issues in social science and Relation of economics to interdisciplinary knowledge
- Schools of Economics: Classical, Keynesian, Contemporary and Modern

**Unit 2:Methods & Skills of teaching Economics**

- Lecture, Discussion, Debate, Inquiry, Problem solving, Survey, Project method, Storytelling and Simulation
- Innovative Practices in Economics Teaching – Brain Storming, work shop, Team teaching, Co-operative learning,
- Role and Characteristics of Economics teacher
- Challenges in teaching Economics

**Unit 3: Instructional Media: Teaching Resources & Aids**

- ICT : Use of economics tTeaching
- Instructional Media: Concept, Importance and types of instructional media and their use in teaching of economics
- Text Book , Map, Charts, Models, PowerPoint presentations and MOOCs(Massive Open Online Courses)
- Micro Teaching
- Unit Planning
- Lesson Planning

**Unit 4 : Evaluation of learning outcomes**

- Evaluation- Nature of educational evaluation, its need, role in education process
- Methods of Assessment: Formative, Summative, Diagnostic
- Preparation of Question paper and Achievement Test
- Assessment techniques
- Diagnostic and Remedial teaching
- Achievement Test Report (ATR): meaning, concept and importance, Components of ATR in Economics
- Credits based system, GPA (Grade Point Average) and CGPA (Cumulative Grade Point Average): meaning, importance and methods
- Report Card: Meaning, Components, Types, Importance and Method

**Transactional strategies**

Lecture-cum-discussion along with interactive group discussion, field trips, group discussions, brain storming and simulation in the form of mock session, case study of banks and insurance etc

**Internal Assessment:** A total of 30 marks have been allotted under Internal Assessment. The nature of the activity, mode and weightage of marks are as follows.

| Sr.No. | Activity | Mode | Weightage of Marks |
|---|---|---|---|
| 1 | Two Sessional will be conducted (Better one will be considered) | Test | 10 |
| 2 | (Lesson Plan Presentation on Any topic of Economics From NCERT Social Science Book From class $6^{th}$ to $10^{th}$ by using all as mentioned in syllabus) Micro teaching skills ) + Practicum | Lesson Plan & Presentation | 10+5 |
| 3 | Percentage of attendance | --- | 05 |
| **Total Marks** | | | 30 |

**Practicum :** Suggestive List:

- Critical study (Review) of any one Economics book
- Development and organization of co-curricular activities
- Preparation of Annual plan, Unit plan and Lesson plan
- Identifying and Evaluating ICT resources suitable for teaching Economics

- Develop a Multi-Media lesson using appropriate ICT resources and transacting the same before peers in simulated teaching exercise.
- Action Research Project Report
- Visits can be organise to
  - ✓ RBI and other Banks
  - ✓ Any Industry or Factory
  - ✓ Finance ministry

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

**Suggested Readings**


- Koutsoyiannis. (1979). *Modern microeconomics*, International Edition, Palgrave Macmillan.
- Arora, P.N. (1985). *Evaluation in economics*. New Delhi: NCERT.
- Arora, P.N. And Shorie, J.P. (1986). *Open book examination question in economics*, New Delhi: NCERT.
- Assistant Masters Association (1974). The Teaching of Secondary School Examinations, London Cambridge University Press.
- Bawa M. S. (ed.) (1998). *Source Book on Strategies of Teaching Social Sciences*, IASE, Deptt. of Education, Delhi University.
- Bawa, M. S. (ed.) (1995). Tendering of Economics: Contemporary Methods and Strategies for Secondary and Senior Secondary levels, IASE, Deptt. of Education, Delhi University.
- Bawa, M. S. (ed.) (1996). *Evaluation in Economics*, IASE, Deptt. of Education, Delhi University.
- Blanchard, O., *Macroeconomics*, 4th Edition, Prentice Hall.
- Chakravorty, S. (1987). Teaching of Economics in India, Bombay, Himalaya Publishing.
- Dombusch, R., Fischer, S & Startz, R., (2015). *Macroeconomics*, 11th edition, McGraw Hill.
- Mishra & Puri, (1995). *Economic development and planning*. Himalaya publishing house.
- Lekhi R.K., (2014). *Economics of Development and Planning*. kalyani Publishers
- Hicks, J.R. (1960). *The social framework- an introduction to economics*, London: Oxford University Press.
- Hodkinson, Steve, Whitehead & David J. (ed) (1986). *Economics Education: Research and Development Issues*, London, New York: Longman.
- Mishra & Puri (2015). *Indian economy*. Himalaya Publishing house.
- Dutt & Sundaram, (2016). *Indian economy*, S.Chand Publisher.

- Kanwar, B.S. (1973). *Teaching of economics*, Ludhiana: Prakash Brothers.
- Khan, R.S. *Teaching economics* (In Hindi), Kota Open University, BE-13.
- Lee, N. (ed) (1975). *Teaching economics*. London: Heinemann Educational Books, Prentice Hall.
- Macroeconomics, (2015). III. Ahuja, S.Chand Publishers
- Mankiew, G, N, 'Principles of Macroeconomics, 9th edition, Macmillan Learning.
- Mangal & Mangal,U. (2018). Pedagogy of social sciences. India:PHI.
- Ahuja, H.L.(2016). *Micro economics*. S.Chand Publishers.
- NCERT (1974). Teaching Units in Economics for High and Higher secondary Stage, New Delhi: NCERT.
- Oliver, J. M. (1977). *The principles of teaching economics within the curriculum*, London Routledge & Kegan Paul.
- Pindyck, R.S., Rubinfeld, D.L. & Mehta, P.L., (2015). *Microeconomics*, 8th edition, Prentice Hall.
- Ray, D. (1998). *Development economics*, Princeton University Press
- Sachs, I, (ed.) (1971). Main trends in Economics Project and Role Playing Economics, London, Macmillan.
- Salvatore, D., and Reed, (2013). *International economics* 11th edition, Wiley.
- Soderster, B.O. (1991). *International economics*, Macmillan.
- Siddiqi, M.H. (1998). *Teaching of economics*. New Delhi: Ashish Publishing House.
- Srivastava, H.S. (1976). Unit Tests in Economics, New Delhi, NCERT.
- Tyagi, S.D. (1973). *Teaching of economics (in hindi)*. Agra: Vinod Pustak Bhandar.
- Varian, Hall R. (1992). *Microeconomic Analysis* 3rd edition, New York : W.W. Norton & Company
- Verma, S. (2018). *Bhartiya arthvyastha*. New Delhi: unique publisher.
- Whitehead, D. J. (ed.) (1974). *Curriculum development in economics*, London: Heinemann Education Books


**Web Resources**

- www.eseindia.org (for documentary films and DVD)
- www.india-seminar.com
- Janchetana.blogspot.com (Hindi and English)
- http://www.ibe.unesco.org/publications/educationalpracticesseries
- 1947PartitionArchive.org
- http://www.indiabudget.nic.in/survey.asp
- dsal.uchicago.edu
- http://bombay.indology.info/mahabharata/statement.html
- http://archive.is/http://www.sdstate.edu/projectsouthasia

- www.harappa.com
- http://www.mughalgardens.org
- http://persian.packhum.org
- www.museum.upenn.edu
- www.alifindia.or
- www.edumaritime.org
- http://parliamentofindia.nic.in
- www.gandhiserve.org
- www.copsey-family.org/~allene/lakshmibai
- https://earth.google.com
- http://www.mapsofindia.com
- Position Paper National Focus Group on Teaching of Social Sciences, NCERT
http://www.ncert.nic.in/new_ncert/ncert/rightside/links/pdf/focus_group/social_science1.pdf
- Package in social science for professional development of in-service teachers. NCERT
http://www.ncert.nic.in/departments/nie/dess/publication/prin_material/ITPD%20Final%20june%2014.pdf
- Learning curves' special issue in social science in schools. (2010). by AzimPremji Foundation
http://azimpremjifoundation.org/pdf/LCXV.pdf
- Learning Indicators and Learning Outcomes at the Elementary Stage. (2014). NCERT
http://www.ncert.nic.in/departments/nie/dee/publication/pdf/LI_Final_Copy_Revised_29.12.14.pdf
- http://nroer.in/home/
- http://www.epathshala.co.in/

***Audio Visual Resources***

- http://www.kabirproject.org/the%20films
- https://www.youtube.com/watch?v=-E6Z-oSwfTA
- https://www.youtube.com/watch?v=0FK-BITdqAs&list=PL5671Y5M9F5tICRg9hPujnRb5fsNmycc7

## PEDAGOGY OF COMMERCE
## COURSE CODE - SOE020217C3104

**Year** I
**Semester** II

**Credit :4**
**Max Marks : 100**

**Essence of the Course**

This course aims to provide student-teachers with the content and pedagogical aspects of Commerce. This course includes basic concepts of commerce discipline as sound content knowledge is essential for effective teaching. For providing students with pedagogical content knowledge, different methods, approaches and strategies of teaching commerce have been included. This course will help student-teachers understand key concepts of commerce as well as methods and procedure of teaching commerce effectively and efficiently.

**Objectives** : After completing this course, the student teachers will be able to :

- explain Meaning, & Scope of commerce.
- develop an understanding about important commercial operations like Trade, Insurance etc.
- know the aims and objectives of teaching commerce at secondary level.
- familiarize various approaches of writing instructional objectives.
- formulate instructional objectives in behavioural terms.
- use various approaches to lesson planning and enable them to design their lesson so as to make them interesting and understandable to the learners.
- familiarize the concept and true purpose of evaluation and be able to construct a test to identify the strength and problem areas of students.
- select appropriate methods, aids and techniques of teaching commerce at secondary level.
- select appropriate co-scholastic activities to promote meaningful learning of concepts.

| Teaching Scheme (session)* | | | Total (L+T+P) | Examination Scheme | | |
|---|---|---|---|---|---|---|
| | | | | Internal Assessment | External Assessment | Total Marks |
| Unit | L | T/P | C | | | |
| I | 12 | 4 | 16 | 30 Marks | 70 Marks | 100 Marks |
| II | 12 | 4 | 16 | | | |
| III | 12 | 4 | 16 | | | |
| IV | 12 | 4 | 16 | | | |
| Total | 48 | 16 | 64 | 30 Marks | 70 Marks | 100 Marks |
| L=Lecture, T=Tutorial, P=Pricticum | | | | | | |



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**Course Content / Syllabus**

**Unit 1 : Introductory Commerce**

- Meaning, definition &Scope Of commerce.
- Trade: Meaning, Concept, Importance & Functions.
- Business organization: Meaning, Concept, characteristics & Types.
- Insurance: Meaning, Concept,Need,Importance, Types& Principles.

**Unit 2 Writing Instructional Objectives**

- Aims and objective of teaching commerce at secondary level
- Bloom's Taxonomy
- Approaches of writing Instructional Objective: Mager,Miller & RCEM Approach
- Writing Instructional Objectives in behavioural terms.

**Unit 3 Lesson Planning in Commerce**

- Meaning, Concept & Importance of Lesson Planning
- Various approaches to lesson planning: Herbart approach & Morrison approach.
- Preparation of Lesson Plan.

**Unit 4 Teaching Methods & Evaluation**

- Methods of teaching commerce: Lecture, Project, Problem solving
- Co-curricular activities: Objectives & Various types.
- Different Types of Co-Scholastic activities for strengthening the understanding of commerce.
- Formative V/s Summative Assessment
- Construction of Achievement test in commerce

**Transactional Strategies**

**Unit 1:**Lecture followed by discussion supplemented by searches on MOOC's and augmented by power- point presentation analytical and synthetic discussions.

**Unit 2:**Lectures, discussions, use of MOOCs, e-platforms, library assignment

**Unit 3:**Lectures, discussions, library assignments,PowerPoint presentations on various approaches to lesson planning, discussion on model lesson plan of commerce formulated by RIE's.

**Unit 4:**Lecture followed by discussion supplemented by searches on MOOC's and augmented by power- point presentation analytical and synthetic discussions.

**Internal Assessment:** A total of 30 marks have been allotted under Internal Assessment. The nature of the activity, mode and weightage of marks are as follows.

| Sr.No. | Activity | Mode | Weightage of Marks |
|---|---|---|---|
| 1 | Two Sessional will be conducted (Better one will be considered) | Test | 10 |
| 2 | (Lesson Plan Presentation on Any topic of Commerce From NCERT Commerce Book From class 10th to 12th by using all as mentioned in syllabus) Micro teaching skills ) + Practicum | Lesson Plan & Presentation | 10+5 |
| 3 | Percentage of attendance | --- | 05 |
| | **Total Marks** | | 30 |

**Practicum**

- Design and Deliver a 15 Minutes presentation on any topic by using Lecture method.
- Prepare a report on India's Trade pattern.
- Prepare PowerPoint presentation on any topic covered in pedagogy of commerce syllabus.
- Sessional work/unit test/practicum/ project based activities and Terminal Assessments
- Construction of Achievement test in commerce

**Suggested Readings**


- Agrawal, J.C. (2018). *Teaching of commerce : A practical Approach* New Delhi; Vikas publishing House
- Babu, M. (2009).Teaching of commerce and accountancy. Centrum Press.
- Bansal, R.K.(1994). *New trends in teaching of commerce; Models of teaching and conceptual learning* Anmol Publishing House.
- Busham, Y.K. (1991).*Fundamentals of business organization &Management.*New Delhi; Sultan Chand & Sons
- Chandra, S.S. (2017). *Pedagogy of school subject commerce*. Meerut: R. Lall Publications
- Doshi, S. (2009). *Modern methods of teaching commerce*. Paradise Publishers.
- Jawawi, R. (2010). Reflective practices in teaching economics and commerce. VDM Verlag Publications.
- Khan, M.S. (1982). *Commerce education* New Delhi: Sterling Publications.
- Kumar, M. (2004).*Modern teaching of commerce* Anmol Publishing House
- Lloyd V. D.(1972). *Teaching business subjects (5th Ed.).* New Jersey: Prentice Hall Publications.
- Singh R.P. & Mansoori, I. (2017) *Pedagogy of school subject commerce*. Meerut: R. Lall Publications.
- Singh, Y.K. (2018). *Teaching of commerce*. New Delhi: APH Publishing House.
- Tonne, H.A. (1975) *Methods of teaching business subjects*. New York. McGraw Company Ltd.
- Venkateswarlu, K. (1993). *Methods of teaching commerce*. New Delhi: Discovery Publishing House.

## DRAMA AND ART IN EDUCATION
## COURSE CODE - SOE020218C2024

**Year :1**
**Semester : II**

**Credit : 2+2 (Theory + Practicum)**
**Max Marks :100 (Theory + Practicum)**

**Essence of the Course**

The course on Drama and Arts in Education has been designed keeping in view the development of the self through arts for every student teacher and for the development of students in school through arts in education to be practiced by every teacher. Two year B.Ed. programme offers school based learning and draws on the latest research into effective teaching, ensuring graduates are well equipped to teach. The course will unfold the aesthetic potentialities of prespective teachers for enabling them to become contributing citizens by promoting all forms of arts in school through hands on experience and integration of art as pedagogy in different subject areas. Pupil teachers will also use these skills in practice teaching during school internship. The essence of Arts Education is to enhance analytical and critical thinking among students, Learning through arts will help student teachers in developing communication and interpersonal as well as presentational skills by bringing these in their teaching practice.

**Objectives** : After completing this course, the student teachers will be able to :

- familiar with the concept of art and its importance in daily life and education.
- develop competencies and skills for teaching of Art.
- acquire skills for integrating different art forms across school curriculum for better learning and develop.
- develop the artistic and aesthetic sensibilities among students to enable them to respond to the beauty in different art forms.
- develop imagination and sense of art and creative interest in art in teaching learning process.
- develop and understanding of drama and art, the scope and purpose of art education and art as the basis of education.
- acquaint about drama as a critical pedagogy and develop consciousness & awareness towards society.
- aware of forms of art, performing and visual and their significam role in human life.
- explore various dance forms and their integration in education practices.
- learn to identify areas that are best suited for drama exploration.
- recognize the role of drama as education in the elementory school and will learn about the different dance styles driven in India.

| Teaching Scheme (session)* | | | | Total (L+T+P) | Examination Scheme | | |
|---|---|---|---|---|---|---|---|
| | | | | | Internal Assessment | External Assessment | Total Marks |
| Unit | L | T | P | C | | | |
| I | 13 | 0 | 0 | 13 | 15 Marks (Theory) 15 Marks (Practicum) | 35 Marks (Theory) 35 Marks (Practicum) | 100 Marks |
| II | 13 | 0 | 0 | 13 | | | |
| III | 0 | 0 | 20 | 20 | | | |
| IV | 0 | 0 | 18 | 18 | | | |
| Total | 26 | 0 | 38 | 64 | 30 Marks | 70 Marks | 100 Marks |
| L= Lecture, T=Tutorial, P=Practical | | | | | | | |

## Course Content

**Unit -1 : Concept of Art and Education**

- Concept of Art and meaning of Visual Communication.
- Elements of Art.
- Importance of colours in human life.
- Art in daily life.
- Art in Education.
- Folk Art- Madhubani, Warli.

**Unit 2 : Aesthetic Sense and Performing Art**

- Importance of Aesthetic sense in human life.
- Transformation of art and Aesthetic sense through Education.
- Introduction of Drama and its types, social and educational relevance of performing art and its place in contemporary Indian society.
- General introduction of seven classical Dance styles, knowledge of Indian Dance & Drama traditions both in classical and Folk Song.
- Drama and Arts as pedagogy of learning and development.
- Exposure to selective Basic skills required for Drama and Art.

**Unit 3 : Methods and Materials of Art and Performing Art**

- Making of Still-Life, Landscape, Portrait Painting, Clay Model and Glass Painting.

- Calligraphy in Hindi and English.
- Stage craft & design, technology and direction of performance.
- Acting for production, play production process.

**Unit 4 : Printing, Painting & Crafting**

- Making Show-Pieces by Paper-cutting and folding.
- Waste Utilization.
- Arrangement Painting with Ladyfinger, Potato, Onion and leaf- any simple block etc.
- Representational Drawing and Painting from Nature - Birds, Animals, Flowers, and Fruits etc.
- Collage-Making, Poster-Making.

**Transactional Strategies**

Hand on experience of working in different medium and materials, preparation and presentation of teaching learning materials, workshop, exhibition, slid/film show, project work, group work planning of a stage-setting, visit, role play, celebrations of Indian festivals and fairs brain-storming, interaction with artists, lectures and demonstration.

**Internal Assessment Strategies:** A total of thirty marks have been allotted under Internal Assessment. The nature of the activity, mode and weightage of marks are divided into two categories theory and practicum respectively as follows.

| S. No. | Theory | | Practical | |
|---|---|---|---|---|
| | Mode | Marks | Mode | Marks |
| 1 | Two- Internal Assessment (Better one will be considered) | 5x2=10 | File work and Viva | 10 |
| 2 | Assignment | 2.5 | Live performance | 2.5 |
| 3 | Percentage of attendance | 2.5 | Percentage of attendance | 2.5 |
| | Total | 15 | Total | 15 |
| | **Total Mark: 30** | | | |

**External Assessment Strategies :**

A total of seventy marks have been allotted under External Assessment. The nature of the activity, mode and weightage of marks are divided into two categories theory and practical respectively as follows.

| S. No. | Component | Mode | Marks | Total |
|---|---|---|---|---|
| 1 | Theory | Term end semester examination | 35 | 35 |
| 2 | Practical | Project Reports | 15 | 35 |
| | | Spot visual/performing activity | 10 | |
| | | viva | 10 | |
| **Total Marks** | | | | **70** |

**Practicum – Suggestive List**

1) Still life Painting.
2) Landscape Painting.
3) Portrait Painting.
4) Poster Making.
5) Clay Model
6) Glass Painting.
7) Products making out of Waste material.
8) Collage making.
9) Folk arts.
10) Paper folding and cutting.

**Suggested Readings :**


- Kakkar Rekha, Makkhar Ragini (2018), *Drama, art and aesthetics in education*, Agra: Rakhi Prakashan.
- Gill Rajesh (2018), *Art Education*, New Delhi: Paragon International Publishers.
- Gill Rajesh (2017), *A textbook of art education*, New Delhi: Paragon International Publishers.
- Singh Chitralekha (2016), *Drama and art in education*, Agra: Publisher Shri Vinod Pustak Mandir.
- Chetan Bharti (2016), *Drama and art in education*, Kalyani Publishers.
- Raw K. Ravikant and P. Ananad Kumar (2017), Drama and Art in Education, Neelkamal.
- Saxena Avnish and Sinh Sushil (2016), *Drama, art and aesthetics in education*, Agra:Rakhi Prakashan Raman Tower, Sanjay place.
- Sharma R. P., Sharma R. K.(2016), *Drama and art in education*, Agra: Radha prakashan mandir.
- Kumar Rajender (2016), *Drama and art in education*, Rajsthan: Jain Prakashan Mandir.

- Roy Reeta (2017), *Perfect art education*, Arya: Publisher Company.
- Chandok Amargeet (2016), *Art and education*, Delhi: Bookman.
- Jain Ritu (2016), *Art education*, Delhi: Bookman.
- Chaturvedi Snehlata (2016), *Art education*, Delhi: Bookman.
- Sharma Sudhir, Singh Kuljeet (2016), Art Education, Delhi: Bookman.
- Prasad Devi (1998), *Art as the basis of Education*, New Delhi: NBT.
- Chawla S.S. (1986),Teacher of Art, Patiala: Publication bureau Punjabi university.
- NCERT (2006), *Position paper national focus group on Arts, Music, Dance and theatre*. New Delhi: NCERT.
- CCRT official website.
- Vatsyayan, kapila (1977), *classical India Dance in literature and the Arts*, New Delhi: Sangeet natak Akademi.
- Chauhan Rita (2016), *drama, Art and Education*, Agra:Agrawal Publications, Sanjay Place.
- Bhatachrya Dilip (1999), *Musical Instrument of tribal India*, New Delhi.

## CRITICAL UNDERSTANDING OF ICT
## COURSE CODE - SOE020219C0022

**Year :I**
**Semester: II**

**Credit: 2**
**Max Marks: 50**

**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. An important aspect of this course is to give a sense of responsibility that comes with the technological advancements. Using technology in a classroom is an important skill for learning teachers towards ICT enabled education. This course focuses on equipping the student teachers with skills of basic computer literacy and ICT-aided learning; and applications of ICT in administrative and academic support systems.

**Objectives:** After completing this course, the student teachers will be able to :

- familiarize with computer system.
- work on Word processing, Spread sheets and Presentation software.
- operate on Internet with safety.
- 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.
- access on line course materials – MOOC and other platforms.
- develop conceptual understanding of Information & Communication Technology
- identify and discuss the policy concerns regarding ICT in Education

| **Teaching Scheme (session)*** | | | | **Total (L+T+P)** | **Examination Scheme** | | |
|---|---|---|---|---|---|---|---|
| | | | | | **Internal Assessment** | **External Assessment** | **Total Marks** |
| Unit | L | T | P | C | | | |
| I | 6 | 2 | 22 | 30 | 15 Marks | 35 Marks | 50 marks |
| II | 8 | 2 | 20 | 30 | | | |
| **Total** | **14** | **4** | **42** | **60** | **15 Marks** | **35 Marks** | **50 Marks** |

**L=Lecture, T=Tutorial, P=Practical**

**Course Content / Syllabus**

**Unit -1 Fundamentals of Computer**

- Introduction of Computer, Components of Computer
- Hardware: Input and Output Devices, Central Processing Unit, Memory and Storage
- Software: Meaning and Types, Features of Application Software, Operating System and its functions, MS Windows, Linux, iOS
- MS WORD: Introduction to a Word Processor, Basic components of MS WORD and its operation
- MS Excel: Introduction to Spreadsheets, Concept of Worksheets and their operations, Spreadsheet operations-entering Numbers ,text, Dates & Time, formulae, Preparation of Worksheets
- MS Power Point:, Basic components of MS Power Point and its operation, creation of Power point Presentation Preparation of different types of slides, slide design, colour and background, slide transition, custom animation

**Unit 2: Conceptual Understanding of Information and Communication Technology and Internet**

- Information and communication technology: Meaning, Concept and Challenges of Integration of ICT in School
- Aims and Objectives of National Policy on Information and Communication Technology (ICT) in School Education in India and National Mission on Education through ICT (NMEICT),
- Internet: Ways of using the Internet in teaching learning process, E-mail, Google Drive, Google Group, Search Engines, Safe surfing mode
- E- educational Resources & Platforms : MOOC's , SWAYAM, Gyan Darshan, Gyan Vani, Sakshat Portal, e-Gyan Kosh, Wikipedia, Face Book, You Tube, Google Scholar

**Transactional Strategies:**

**Unit I**

i) Hands on experience in ICT Lab
ii) Demonstration on various application of MS Office
iii) Development of teaching learning resources using MS Office
iv) Internet Surfing/Web browsing in ICT Lab

**Unit II:**

i) Discussion on various ICT related issues
ii) Lecture cum Demonstration method will be used,

iii) Interaction with ICT software and hardware specialist
iv) Power point presentation on various topics

**Internal Assessment Strategies :**

A total of 15 marks have been allotted under Internal Assessment. The nature of the activity, mode and weightage of marks are as follows.

| S. No. | Activity | Mode | Weightage of Marks |
|---|---|---|---|
| 1 | Two Presentation from suggestive list ( Better one out of Two)– Viva- Voce | Power Point Presentation | 5+5 |
| 2 | Preparation of a Practical File on various topics | Assignment | 2.5 |
| 3 | Percentage of attendance | | 2.5 |
| | **Total Marks** | | **15** |

**Practical**

**Choose any two of the following and Make a soft file and submit in CD form for evaluation:**

- Making of a resume in MS Word.
- Making of a Lesson Plan in MS Word.
- Making of presentation in MS Power Point of any topic from B.Ed. Curriculum or school subject.
- Making of progress report-card and annual results in MS Excel
- Graphical representation of data.
- Making of projects using internet.
- Making of projects integrating internet and smart classroom.
- Any other project/assignment given by the institution.

**NOTE: External practical will be conducted by external examiner at the end of the semester**

**Suggested Readings**


- Ara.A. Sujhatha, M & Ramakrishna(2018). *ICT mediation in teaching learning*. New Delhi: Neelkamal Publications.
- Bansal & Kaur. (2016). *Critical understanding of ICT*. Ludhiana. Tandon Publication
- Cheema. S.S., Kumar. G & Preet. K.(2015). *ICT skill development*. Patiala: Twenty first Century Publication.
- Benkler. Y. (2006). *The wealth of networks: How social production transforms markets and freedom*. Yale: University Press.
- Brain K. W & Stacey, S. (2005). *Using information technology*. 6th Edition: Tata McGraw Hill, Curtin.

- Douglas. C. (2007). *The internet book: Everything you need to know about computer networking and how the internet works*. Prentice Hall.
- DSERT, Karnataka (2012). *Position paper on ICT mediation in education*. DSERT.
- MHRD, GOI (2004 revised 2010). *National ICTC school's scheme, development of education and literacy*. MHRD, New Delhi
- MHRD (2012). *National policy on information and communication technology (ICT) in school education*. MHRD, Government of India.
- Castells, M (2011). The rise of the network society. The information age: Economy, society, and culture (Vol. I, II and III). John Wiley and Sons.
- National Mission in Education through ICT www.iitg.ernet.in/cet/MissionDocument_20Feb09.pdf
- NCERT (2013). *National repository of open educational resources*, CIET, New Delhi (nroer.gov.in)
- Sinha & Sinha (2005). *Computer fundamentals* New Delhi: BPB Publications.


**Web resources**


- E-book: Getting Started with Libre Office 3.4 available at ttp://wiki.documentfoundation.org
- Free Software, Free Society: Selected Essays of Richard M. Stallman, digital book available on www.notabug.com/2002/rms-essays.pdf
- Free Software Foundation. www.fsf.org/
- www.unesdoc.unesco.org/images/0013/001390/139028e.pdf
- Information and Communication Technology Policy in School Education 2010. www.mhrd.gov.in/sites/upload_files/mhrd/files/ReviesICT_School.pdf
- http://en.wikibooks.org/wiki/Computers_for_Beginners. An exhaustive source for beginners
- National Policy on Information and Communication Technology (ICT) In School Education. http://mhrd.gov.in/sites/upload_files/mhrd/files/upload_document/revised_policy%20document%20ofICT.pdf
- Understanding MOOC's (2013). edited by Sanjaya Mishra, http://cemca.org.in/ckfinder/userfiles/files/EdTech%20Notes%202_Littlejohn_final_1June2013.pdf
- Increasing Access through Mobile Learning. (2014) edited by: Mohamed Ally and Avgoustos Tsinakos.. http://oasis.col.org/bitstream/handle/11599/538/pub_Mobile%20Learning_web.pdf?sequence=4&isAllowed=y
- David Porter and Russell Beale (2015) A Policy Brief on MOOC's. http://oasis.col.org/bitstream/handle/11599/825/Policy%20Brief%20on%20MOOC's%20May%2025%2011Q%20print.pdf?sequence=1&isAllowed=y
- Mobile Learning - UNESCO, Steve Vosloo, 1 minute. http://www.unesco.org/archives/multimedia/index.php?s=films_details&pg=33&id=3601
- Expanding Mobile Learning, 2015, UNESCO, Nil Viasnoff (interviewer), 2 minutes. http://www.unesco.org/archives/multimedia/index.php?s=films_details&pg=33&id=2999

- How ICT can Support Teacher Training. 2014. UNESCO. Asha Kanwar (speaker5 minutes, http://www.unesco.org/archives/multimedia/index.php?s=films_details&pg=33&id=3722 and video
- Leveraging Mobile Technology for Education, 2013. UNESCO. Nil Viasnoff (interviewer), 5 minutes, http://www.unesco.org/archives/multimedia/index.php?s=films_details&pg=33&id=2997
- Vidya M. S.(2014), Technology tools for Teachers, http://cemca.org.in/ckfinder/userfiles/files/Technology%20Tools%20for%20Teachers_Low.pdf
- E-learning: A Guidebook of Principles, Procedures and Practices, SOM NAIDU (2006), cemca.org.in/ckfinder/userfiles/files/e-learning_guidebook.pdf
- Internet privacy and freedom of expression (2012) http://unesdoc.unesco.org/images/0021/002182/218273e.pdf
- Educational Multimedia:A Handbook for Teacher-Developers (2003), cemca.org.in/ckfinder/userfiles/files/EdMul_Full.pdf
- EXCEL TUTORIAL, http://www.excel-easy.com/
- TONY BATES, Teaching in a Digital Age, http://open.umn.edu/opentextbooks/BookDetail.aspx?bookId=221www.ictcurriculum.gov.in.

## ICT in Education

## COURSE CODE - SOE020236GEC2024

**Year I**
**Semester: II**

**Credit: 4**
**Max Marks: 100**

**Essence of the Course:**

The ultimate aim of teaching ICT in Education is to disseminate the ICT skills across the disciplines and aspire for multiple trajectories of best practices as per needs of the discipline. The constantly developing field of ICT will always need exploration of new technological advancements in the context of teaching-learning. It will give a broad understanding of ICT that include computing and communication technologies. The students will be able to use basic office automation. Using technology in a classroom is an important skill for pursuing ICT enabled education. This course focuses on equipping the students with skills of basic computer literacy and ICT-aided learning.

**Objectives:** After completing this course, the student teachers will be able to :

- familiarise with computer system.
- work on Word processing, Spread sheets and Presentation software.
- operate on Internet with safety.
- elucidate the application of ICT for Teaching Learning.
- develop various skills to use computer technology for sharing the information.
- access on line course materials – MOOC and other platforms.
- develop conceptual understanding of Information and Communication Technology.
- discuss and formulate an opinion about recent trends of ICT in education

| Teaching Scheme (session)* | | | | Total (L+T+P) | Examination Scheme | | |
|---|---|---|---|---|---|---|---|
| | | | | | Internal Assessment | External Assessment | Total Marks |
| Unit | L | T | P | C | | | |
| I | 10 | 2 | 3 | 15 | 30 Marks (15 Theory + 15 Practical) | 70 Marks (35 Theory +35 Practical) | 100 Marks |
| II | 10 | 2 | 3 | 15 | | | |
| Practical | 0 | 6 | 54 | 60 | | | |
| Total | 20 | 10 | 60 | 90 | 30 Marks | 70Marks | 100 Marks |

**L= Lecture, T=Tutorial, P=Practical**

**Course Content / Syllabus**

**Unit –I Fundamentals of ICT and its Tools**

- Introduction of Computer, Components of Computer
- Hardware: Input and Output Devices, Central Processing Unit, Memory, Storage
- Software: Meaning and Types, Features of Application Software
- ICT tools and their utility

**Unit II: Conceptual Understanding of Information and Communication Technology**

- Meaning & Concept of Information and communication technology
- Types of Communication, Verbal, Nonverbal, Synchronous and Asynchronous Communication
- Role, importance and challenges of utilisation of ICT in education
- Recent trends of ICT in education: MOOCs, Blended learning, Flipped classroom.

**Practical:**

- MS WORD: Introduction to a Word Processor, Basic components of MS WORD and its operation
- MS Excel: Introduction to Spreadsheets, Concept of Worksheets and their operations, Spreadsheet operations-entering Numbers ,text, Dates & Time, formulae, Preparation of Worksheets
- MS Power Point:, Basic components of MS Power Point and its operation, creation of Power point Presentation Preparation of different types of slides, slide design, colour and background, slide transition, custom animation
- Internet: Ways of using the Internet in teaching learning process, E-mail, Google Group, Google Drive, Search Engines, Safe surfing mode
- Accessing E- educational Platforms, Gyan Darshan, Gyan Vani, Sakshat Portal, e-Gyan Kosh, Wikipedia, Face Book, You Tube, Google Scholar.

**Transactional Strategies:**

**Unit I:**

- Discussion on various tools of ICT
- Demonstration of hardware of computer in ICT lab
- Lecture-cum-discussion on: softwares

**Unit II:**

- Discussion and demonstration of various types of communication
- Lecture-cum-discussion on: role, importance, challenges and recent trends of ICT in education

- Debate on whether ICT is bane or boon in education.

**Internal Assessment Strategies:** A total of thirty marks have been allotted under Internal Assessment. The nature of the activity, mode and weightage of marks are as follows.

| S. No. | Activity | Mode | Weightage of Marks |
|---|---|---|---|
| 1 | Two sessional tests (Better one will be considered) | (One written + one practical) | 10 |
| 2 | Preparation of an Practicum File on various topics followed by presentation in the classroom | Practicum<br>–<br>Presentation (PPT) | 10+ 5 |
| 3 | Percentage of attendance | As per University rules | 5 |
| | Total Marks | | 30 |

**Practical**

**Choose any two of the following and Make a soft file and submit in CD form for evaluation:**

Making of a resume in MS Word.
Making of presentation in MS Power Point of any topic.
Making of progress report-card and annual results in MS Excel.
Graphical representation of data.
Making of projects using internet.
Report of experience of e-learning using any platform mentioned in the syllabus.
Any other project/assignment given by the institution.

**NOTE: External practical will be conducted by external examiner at the end of the semester**

**Suggested Readings**


- Ara.A. Sujhatha, M & Ramakrishna(2018). *ICT mediation in teaching learning.* New Delhi: Neelkamal Pubheations.
- Bansal & Kaur. (2016). *Critical understanding of ICT. Ludhiana: Tandon Publication.*
- Cheema, S.S., Kumar, G. & Preet, K (2015). *ICT skill development.* Patiala: Twenty first Century Publication.
- Benkler, Y. (2006) *The wealth of networks: How social production transforms markets and freedom.* Yale University Press.
- Brian K. W. & Stacey, S. (2005) *Using information technology.* 6th Edition Tata McGraw Hill, Curtin.
- Douglas, C. (2007). *The internet book. Everything you need to know about computer networking and how the internet works.* Prentice

Hall.

- DSERT. Karnataka (2012). *Position paper on ICT mediation in education*. DSERT.
- MHRD. GOI (2004 revised 2010) *National ICTC schools scheme. development of education and literacy*. MHRD, New Delhi
- MHRD (2012) *National policy on information and communication technology (ICT) in school education*. MHRD, Government of India.
- Castells. M. (2011). The rise of the network society: The information age: Economy. society, and culture (Vol. I, II and III). John Wiley and Sons.
- National Mission in Education through ICT www.iitg.ernet.in/cet/MissionDocument_20Feb09.pdf
- NCERT (2013) *National repository of open educational resources*. CIET. New Delhi (nroer.gov.in)
- Sinha & Sinha (2005). *Computer fundamentals* New Delhi: BPB Publications.

**Web resources**

- E-book: Getting Started with Libre Office 3.4 available at ttp://wiki.documentfoundation.org
- Free Software. Free Society: Selected Essays of Richard M. Stallman. digital book available on www.notabug.com/2002/rms-essays.pdf
- Free Software Foundation. www.fsf.org/
- www.unesdoc.unesco.org/images/0013/001390/139028e.pdf
- Information and Communication Technology Policy in School Education 2010. www.mhrd.gov.in/sites/upload_files/mhrd/files/RevisedICT_School.pdf
- http://en.wikibooks.org/wiki/Computers_for_Beginners. An exhaustive source for beginners
- National Policy on Information and Communication Technology (ICT) In School Education. http://mhrd.gov.in/sites/upload_files/mhrd/files/upload_document/revised_policy%20documen%20oICT.pdf
- Understanding MOOCs (2013). edited by Sanjaya Mishra. http://oemca.org.in/ckfinder/userfiles/files/EdTech%20Notes%202_Littlejohn_final_1June2013.pdf
- Increasing Access through Mobile Learning. (2014) edited by Mohamed Ally and Avgoustos Tsinakos,. http://oasis.col.org/bitstream/handle/11599/558/pub_Mobile%20Learning_web.pdf?sequence=4&isAllowed=y
- David Porter and Russell Beale (2015) A Policy Brief on MOOCs. http://oasis.col.org/bitstream/handle/11599/825/Policy%20Brief%20on%20MOOCs%20May%2025%20HQ%20print.pdf?sequence=1&isAllowed=y
- Mobile Learning – UNESCO. Steve Vosloo. 1 minute. http://www.unesco.org/archives/multimedia/index.php?s=films_details&pg=33&id=3601
- Expanding Mobile Learning. 2013 - UNESCO. Nil Viasmoff (interviewer). 2 minutes. http://www.unesco.org/archives/multimedia/index.php?s=films_details&pg=33&id=2999

- How ICT can Support Teacher Training. 2014. UNESCO, Asha Kanwar (speaker5 minutes, http://www.unesco.org/archives/multimedia/index.php?s=films_details&pg=33&id=3722 and video
- Leveraging Mobile Technology for Education, 2013, UNESCO, Nil Viasnoff (interviewer), 5 minutes, http://www.unesco.org/archives/multimedia/index.php?s=films_details&pg=33&id=2997
- Vidya M. S.(2014), Technology tools for Teachers, http://cemca.org.in/ckfinder/userfiles/files/Technology%20Tools%20for%20Teachers_Low.pdf
- E-learning: A Guidebook of Principles, Procedures and Practices, SOM NAIDU (2006). cemca.org.in/ckfinder/userfiles/files/e-learning_guidebook.pdf
- Internet privacy and freedom of expression (2012) http://unesdoc.unesco.org/images/0021/002182/218273e.pdf
- Educational Multimedia:A Handbook for Teacher-Developers (2003). cemca.org.in/ckfinder/userfiles/files/EdMul_Full.pdf
- EXCEL TUTORIAL, http://www.excel-easy.com/
- TONY BATES, Teaching in a Digital Age, http://open.umn.edu/opentextbooks/BookDetail.aspx?bookId=221www.ictcurriculum.gov in.
- https://swayam.gov.in/about
- https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/315591/DfE_RR355_-_Opportunities_for_MOOCs_in_schools_FINAL.pdf

## ESSENTIALS OF GUIDANCE AND COUNSELING
## COURSE CODE : SOE020237GEC2024

**Year : I**
**Semester : II**

**Credit : 2+2 (Theory + Practicum)**
**Max Marks : 100 (Theory + Practicum)**

**Essence of the Course**

The course on Essentials of Guidance and Counseling has been designed keeping in view the proper development of the individual. This course aims to counsel and guide the young generation for defining their career path ahead. It also helps to develop understanding and competencies required to counsel students. The course will unfold the potentialities of learners for enabling them to live life smoothly. The essence of Guidance and Counseling is to enhance analytical and critical thinking among students which will help students in developing their abilities as well as skills.

**Objectives :** After completing this course, the student teachers will be able to :

- develop conceptual understanding of guidance and its importance in daily life
- provide comprehensive training to learners
- help learners develop skills and techniques to provide the needed services to individuals, groups and organizations
- assess and diagnose the nature and intensity of day to day problems of the masses
- enable the learner to integrate psychological principles and therapeutic techniques as required during the Counseling Process
- develop professional competence among the learners
- differentiate between guidance and counseling
- list the main objectives of guidance and counseling programmes in education
- explore various types of guidance and counseling
- encourage learners to maintain the highest standards in offering services to individuals, groups and organizations
- critically analyze the role of a teacher as a guide in school
- identify various qualities of a teacher necessary for a counseling role
- develop competencies and skills in individuals to live life smoothly

| Teaching Scheme (session)* | | | | Total (L+T+P) | Examination Scheme | | |
|---|---|---|---|---|---|---|---|
| | | | | | Internal Assessment | External Assessment | Total Marks |
| Unit | L | T | P | C | | | |
| I | 13 | 0 | 0 | 13 | 15 Marks (Theory) | 35 Marks (Theory) | 100 Marks |
| II | 13 | 0 | 0 | 13 | | | |
| Practicum | 0 | 0 | 38 | 38 | 15 Marks (Practicum) | 35 Marks (Practicum) | |
| Total | 26 | 0 | 38 | 64 | 30 Marks | 70 Marks | 100 Marks |
| L=Lecture, T=Tutorial, P=Practicum | | | | | | | |

**Course Content / Syllabus**

**Unit -1 Conceptual Understanding of Guidance**

- Meaning and Definition of Guidance
- Functions of Guidance
- Fundamental Principles of Guidance
- Need for Guidance Services in India
- Types of Guidance: Educational, vocational and Personal
- Role of a class teacher in Guidance programme

**Unit 2 Counseling**

- Concept of Counseling
- Difference between Guidance and Counseling
- Types of Counseling:
  (a) Direct Counseling
  (b) Indirect Counseling
  (c) Eclectic Counseling
- Teacher as a Counselor

**Practical: Select any three out of the following -**

1. Administration and interpretation of any two.

-Intelligence Test
-Interest Inventory
-Aptitude Test
-Personality Test

2. Prepare a case study of two students one general and one problem students
3. Planning/Preparing Guidance Programme for School.
4. Plan a Motivational Schedule for enhancing learning
5. Create a School Development Plan for initiating a guidance and counseling programme in schools

**Transactional Strategies:**

Lecture cum discussion, use of audio visual learning material, discussion brainstorming reflection, conduct counseling sessions, assignments on various topics, presentation of case study of students in need of counseling, group participation and group discussions conduct of psychological Tests, project work and field.

**Internal Assessment Strategies:**

A total of thirty marks have been allotted under Internal Assessment. The nature of the activity, mode and weightage of marks are divided into two categories theory and practical respectively as follows.

| | Theory | | Practical | |
|---|---|---|---|---|
| **S. No.** | **Mode** | **Marks** | **Mode** | **Marks** |
| 1 | Two- Internal Assessment | 5x2=10 | Project Work and Viva-voce | 12.5 |
| 2 | Assignment | 2.5 | | |
| 3 | Percentage of attendance | 2.5 | Percentage of attendance | 2.5 |
| | Total | 15 | Total | 15 |
| | **Total Marks** | 30 | | |

**External Assessment Strategies:** A total of seventy marks have been allotted under External Assessment. The nature of the activity, mode and weightage of marks are divided into two categories theory and practical respectively as follows.

| S. No. | Component | Mode | Marks | Total |
|---|---|---|---|---|
| 1 | Theory | Term end semester examination | 35 | 35 |
| 2 | Practical | Project Reports | 25 | 35 |
| | | Viva-Voce | 10 | |
| **Total Marks** | | | | 70 |

**Suggested Readings:**


- Ajowi, J. O., & Simatwa, E. M. W. (2010). The role of guidance and counseling in promoting student discipline in secondary schools in Kenya: A case study of Kisumu district. *Educational research and reviews*, 5(5), 263–272. Retrieved from: http://www.academicjournals.org/ERR
- Barki, B. G., & Mukhopadhyay, B. (2008). *Guidance and counselling: A manual* (10th reprint). New Delhi: Sterling.
- Chadurvethi, R. (2006). *Guidance and counseling techniques*, Chennai: S B A Book.
- Chandanpat (2018). *Guidance and counselling*. ND: Educational Publisher & Distributor.
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- Dev, K. (2005). *Educational guidance*. New Delhi: Pragun Publication.
- Gibson, Robert L. & Mitchell, Marianne, H. (2016). *Introduction to counselling and guidance*. New Delhi: Pearson Prentice Hall in India.
- Gladding, R (2018). Introduction to counselling. ND: Pearson.
- Hurlock, E. B. (2008). *Developmental psychology* (5th ed.). London: McGraw-Hill.
- Mehdi, B. (1967). *Educational & vocational guidance in india*, New Delhi : NCERT.
- Migel,J (2001). *Counseling in careers guidance*, U S.: Open University Press.
- Nayak, A. K. (2007). *Guidance and counselling*. New Delhi: APH Publishing.
- Okum, B. F., & Kantrwitz, R. E. (2008). *Effective helping: Interviewing and counseling techniques* (7th ed.). Belmont: Thomson.
- Paterson, C.H.(1962). *Counseling and guidance in schools*, New York. Harper & Bros.
- Perry, W. (2008). *Basic counselling techniques: A beginning therapist's toolkit* (2nd ed.). Bloomington: Author House.
- Pesricha, P.(1976): *Guidance & counseling in indian education*. New Delhi : NCERT.
- Roeber, E. & Smith, G. D.(1955). *Organisation and administration of guidance programmes*. New York: Mc Graw Hill Book Co.
- Shaffer. D. R., & Kipp. K. (2010). *Developmental psychology: Childhood and adolescence* (8th ed.). Belmont: Wadsworth.
- Traxler, A.E.(1961). *Techniques of guidance*,New York: Harper & Bros.
- Yuksel-Sahin, F. (2009) The evaluation of counselling and guidance services based on teacher views and their prediction based on some variables. *International journal of instruction*. 2(1)

## PERFORMING AND VISUAL ARTS

**Course Code : SOE020238GEC2024**

**Year** I
**Semester** II

**Credit: 4 (2 Theory + 2 Practicum)**
**Max Marks: 100 (Theory + Practicum)**

**Essence of the Course**

The course on Performing and Visual Arts has been designed keeping in view the development of the self through arts for every student. B.Ed. programme offers General Elective course to the students of other Departments. The course will unfold the aesthetic potentialities of students for enabling them to become contributing citizens by promote all forms of arts through hands on experience and integration of art in different subject areas. The essence of Arts Education is to enhance analytical and critical thinking among students and learning through the arts will help student in developing their communication and interpersonal skills as well as presentational skills by bringing these in their daily practice.

**Objectives** : After completing this course, the student teachers will be able to :

- familiar with the concept of Performing and Visual Arts its importance in daily life.
- develop competencies and skills for teaching of Art.
- explore how art can enhance learning.
- get acquainted with various local, national art forms.
- present and describe their art work in a creative and expressive manner.
- acquire skills for integrating different art forms across Country for better learning.
- develop the artistic and aesthetic sensibilities among students to enable them to respond to the beauty in different art forms.
- develop imagination sense and creative interest in different form of art.
- develop consciousness & awareness towards society through drama..
- aware of forms of art, performing and visual and its significant role in human life.
- explore various dance forms and their integration in daily life.
- learn to identify areas that are best suited for drama exploration.
- recognize the role of drama as education in the elementary school and will learn about the different dance styles driven in India.

| Teaching Scheme (session)* | | | | Total (L+T+P) | Examination Scheme | | |
|---|---|---|---|---|---|---|---|
| | | | | | Internal Assessment | External Assessment | Total Marks |
| Unit | L | T | P | C | | | |
| I | 13 | 0 | 0 | 13 | 15 Marks (Theory)<br>15 Marks (Practicum) | 35 Marks (Theory)<br>35 Marks (Practicum) | 100 Marks |
| II | 13 | 0 | 0 | 13 | | | |
| III | 0 | 0 | 20 | 20 | | | |
| IV | 0 | 0 | 18 | 18 | | | |
| Total | 26 | 0 | 38 | 64 | 30 Marks | 70 Marks | 100 Marks |
| L=Lecture, T=Tutorial, P=Practicum | | | | | | | |

**Course Content / Syllabus**

**Unit -1 : Introduction to Performing and Visual Arts**

- Concept of Performing and Visual Arts
- Music, Dance, Theatre
- Elements of art.
- Importance of colour and psychology of colours.
- Classical art.

**Unit 2 : Acting Direction and Applied Arts**

- Acting according to Natyashastra.
- Concept of Direction and Design.
- History of advertising.
- Prominent folk art in India.

**Unit 3 :Performing and Design Technology**

- Acting.
- Direction.
- Stage Craft & Design Technology.
- Basic Drawing.
- Writing skills.
- Design -2d/3d.
- Waste utilization.

**Unit 4 : Play Production Process**

- Performance based on Mime.
- Acting Performance with Voice and speech.
- Practical of Direction and Stage Craft.
- Advertising art and ideas.
- Ideas of print painting.
- Poster design/ Hoarding

**Transactional Strategies** : Hand on experience of working in different medium and materials, preparation and presentation of teaching learning materials, workshop, exhibition, slid/film show, project work, group work planning of a stage-setting, visit, role play, celebrations of Indian festivals and fairs brain-storming, interaction with artists, lectures and demonstration.

**Internal Assessment Strategies** : A total of thirty marks have been allotted under Internal Assessment. The nature of the activity, mode and weightage of marks are divided into two categories theory and practical respectively as follows.

| | Theory | | Practicum | |
|---|---|---|---|---|
| **S. No.** | **Mode** | **Marks** | **Mode** | **Marks** |
| 1 | Two- Internal Assessment | 5x2=10 | File work and Viva | 10 |
| 2 | Assignment | 2.5 | Live performance | 2.5 |
| 3 | Percentage of attendance | 2.5 | Percentage of attendance | 2.5 |
| | Total | 15 | Total | 15 |
| | **Total Marks** | | | 30 |

**External Assessment Strategies :** A total of seventy marks have been allotted under External Assessment. The nature of the activity, mode and weightage of marks are divided into two categories theory and practical respectively as follows.

| S. No. | Component | Mode | Marks | Total |
|---|---|---|---|---|
| 1 | Theory | Term end semester examination | 35 | 35 |
| 2 | Practicum | Project Reports | 15 | 35 |
| | | Spot visual/performing activity | 10 | |
| | | viva | 10 | |
| | **Total Marks** | | | 70 |

**Suggested Readings**


- Singh Yadav, Narendra (2012),*Graphic design, rajsthan:rajsthan*, Hindi Granth Akadami, Jaipur.
- Singh Yadav, Narendra(2010), *Advertising technical and theory*, Rajsthan: Rajsthan Hindi Granth Akadami, Jaipur.
- Tivari Arjun,(2010), *Modern advertising art and behaviour*, Uttar Pradesh:Vishwavidyalaya Prakashan, Varanasi.
- Gill Rajesh (2018), *Art education*, New Delhi: Paragon International Publishers.
- Gill Rajesh (2017),*A textbook of art education*, New Delhi: Paragon International Publishers.
- Singh Chitralekha (2016), *Drama and art in education*, Agra: Publisher Shri Vinod Pustak Mandir.
- Chetan Bharti (2016), *Drama and art in education*, Kalyani Publishers.
- Raw K. Ravikant and P. Ananad Kumar (2017), *Drama and art in education*, Neelkamal.
- Saxena Avnish and Sirth Sushil (2016), *Drama, art and aesthetics in education*, Agra:Rakhi Prakashan Raman Tower, Sanjay place.
- Sharma R. P., Sharma R. K.(2016), *Drama and art in education*, Agra: Radha prakashan mandir.
- Kumar Rajender (2016), *Drama and art in education, rajsthan*: Jain Prakashan Mandir.
- Roy Reeta (2017), *Perfect art education*, Arya: Publisher Company.
- Chandok Amargeet (2016), *Art and education*, Delhi: Bookman.
- Jain Ritu (2016), *Art education*, Delhi: Bookman.
- Chaturvedi Snehlata (2016), *Art education*, Delhi: Bookman.
- Sharma Sudhir, Singh Kuljeet (2016), *Art education*, Delhi: Bookman.
- Prasad Devi (1998), *Art as the basis of education*, New Delhi: NBT.
- Chawla S.S. (1986),*Teacher of art, patiala*: Publication bureau Punjabi university.
- NCERT (2006), *Position paper national focus group on arts, music, dance and theatre*. New Delhi: NCERT.
- Vatsyayan, kapila (1977), *Classical india dance in literature and the arts*, New Delhi: Sangeet natak Akademi.
- Chauhan Rita (2016), *Drama, Art and Education*, Agra:Agrawal Publications, Sanjay Place.
- Bhatachrya Dilip (1999), *Musical instrument of tribal india*, New Delhi.

# SYLLABUS

## M.Ed.

## (Master of Education)



## School of Education (2018-20)

**w.e.f. 03/01/2019**

## Central University of Haryana

# M.Ed. Programme Implementation and Assessment

## 1. Curriculum

The M.Ed. programme is designed to provide opportunity for students to extend as well as deepen their knowledge and understanding of education, specialize in selected areas and also to develop research capacities leading to specialization in either elementary education or secondary education. The curriculum of the two-year M.Ed programme shall comprise of the following components:

1) A Common Core that includes Perspective Courses, Tool Courses, Teacher Education Course, and A Self-development component;
2) Specialisation Branches where students choose to specialize in any one of the school levels/areas (such as elementary, secondary and senior secondary);
3) Reseach leading to dissertation; and
4) Field immersion/attachment/internship.

There shall be core courses (which shall have about 60% of credits) and specialized courses in elementary education or secondary education and dissertation with about 40% of credits.

### (a) Theory (Core and Specialization) Courses

The theory courses are divided into core courses and specialization courses. The main core courses shall comprise perspective courses, Tool Courses and Teacher Education courses.

Perspective Courses shall be in the areas of: Philosophy of Education, Sociology-History-Political-Economy of Education, Psychology of Education, Education Studies and Curriculum Studies. Tool Courses shall comprise of those in basic and advanced level education research, academic/professional writing and communication skills and educational technology including workshops/courses in ICT. Teacher education courses (which are also linked with the field internship/immersion/attachment in a teacher education institution) shall also be included in the core.

The specialization component/branches shall offer students a specialization in one of the school stages-elementary (upto VIII), or secondary and senior secondary (VI to XII). The courses within the school stage specialization shall represent/cover selected thematic areas pertinent to that stage such as: Curriculum, Pedagogy and Assessment; Policy, Economics and Planning; Educational Management and Administration; Education for differently abled; etc. Other specialization may also be planned. A field internship/attachment relevant to the area of specialization shall be organized during the programme.

Critical reflection on gender, disability and marginalisation should cut-across the courses in core and specialization. Similarly skills pertaining to ICT and educational technology should be integrated in various courses in the programme. Besides, yoga education shall form an integral part of the curriculum.

### (b) Practicum

Organisation of workshops, practicum activities and seminars to enhance professional skill and understanding of the students shall be part of the teaching modality of the various courses.

### (c) Internship and Attachment

Fields attachments/internships/immersion shall be facilitated with organizations and institutions working in education. These would aim at engaging the students with field-based situations and work in elementary and other levels of education and to provide an opportunity for reflection and writing on the same. Systematically planned field internship/attachment in a teacher education institution, and in the specialization area chosen by the students shall be organized during the programme.

Close mentorship by faculty in relevant areas should be provided in the programme in the form of tutorials, guided reading groups, field attachment, and guided research dissertation.

**2. Programme Implementation**

The institution will have to meet the following specific demands of this professional programme of the study (M.Ed.):

(i.) Prepare a calendar for all activities, including internship and field attachment. The calendar of the M.Ed. programme shall be synchronised with the academic calendar of the institutions identified for internship and attachment.

(ii.) Submission of a Dissertation which could be based on primary field data or secondary data or a treatise comprising of a long reflective and critical essay on an approved topic shall be compulsory.

(iii.) For the conduct of the dissertation, the ratio of the faculty to students for guidance and mentoring shall be of 1:5.

(iv.) Structured engagement of M.Ed. students with educational sites/fields for not less than 4 weeks resulting in a reflective report. The suggested sites/fields are as follows:

a. Professional pre-service teacher education programme.
b. An organization engaged in the development of innovative curriculum and pedagogic practices.
c. International/National/State institution involved in curriculum design, textbook development, education policy planning, formation and implementation, educational administration and management.
d. In-service training programmes for school teacher.

(v) The institution shall initiate discourse in education by periodically organizing seminars, debates, lectures and discussion groups for students and faculty. Students' participation in the weekly research colloquium/seminar shall be ensured.

(vi) There shall be provision and mechanisms and provisions in the institutions for addressing complaints of students and faculty and for redressal of grievances.

(vii) Mechanisms shall be worked out where faculty other than the ones actually dealing with the course shall be involved in the work of institution.

**3. Assessment**

For each theory course, at least 30% weightage shall be assigned for continuous internal assessment and 70% for examination conducted by the examining body. The weightage for the internal and external assessment for theory and practicum courses shall be such as prescribed by the affiliating university based on the above formulation. The bases of internal assessment may include individual/ group assignment, seminars presentations, field attachment, appraisal reports etc. One-fourth of the total marks/credits/weightage shall be assigned to practicum, internship, field attachment and dissertation.

## Course Structure of Master of Education (M.Ed.) under Choice Based Credit System (Academic Session: 2018-20)

### Total No. of Credits in Two Years= 90+8=98

### M.Ed. Semester- I

| S. No. | Course Credit | Course Code | Course Title | Total Marks | Credits (Theory/ Tutorial/ Practicum) | Practical | Class Teaching / Field Based Activity Hours per week | Internal Assessment Weightage | External Assessment Weightage |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 4 | SOE010101C3014 | Psychology of Learning and Development | 100 | 4 | 0 | 4 | 30% | 70% |
| 2 | 4 | SOE010102C3014 | Historical, Political & Economic Foundations of Education | 100 | 4 | 0 | 4 | 30% | 70% |
| 3 | 4 | SOE010103C3014 | Educational Studies | 100 | 4 | 0 | 4 | 30% | 70% |
| 4 | 4 | SOE010104C3014 | Introduction to Educational Research | 100 | 4 | 0 | 4 | 30% | 70% |
| 5 | 2 | SOE010105C0022 | ICT in Education | 50 | 0 | 2 | 4 | 60% | 40% |
| 6 | 2 | SOE010106C0022 | Development of Self: Yoga Education | 50 | 0 | 2 | 4 | 60% | 40% |
| 7 | 2 | SOE010107C0022 | Dissertation Part-I | 50 | 0 | 2 | 4 | 60% | 40% |
| 8 | 4 | | **Taken from other Department/ MOOC** | 100 | 4 | 0 | 4 | 30% | 70% |
| **Total** | **26** | | | **650** | **20** | **6** | **32** | | |

**Practicum/ Hands on/ students Activity / Seminar/ Workshop/etc; during Practicum hours** **Number of days=100**

- **1 credit Theory/ Tutorial/ Practicum=16 hours in a semester**
- **1 credit practical=32 hours in a semester**
- **1 credit=25 Marks**
- Viva-Voice exam for course 05 will be conducted by the external examiner at the end of the semester and weightage will be 40% external & 60% Internal.
- Practical Examination for Course No. 6 & 7 will be 40% external & 60% Internal.
- **A student has to take 4 credits General Elective Course from other department course/ MOOC approved by C.U.H/ U.G.C**
- **General Elective Courses Offered by M.Ed. to other department : Personality Development (4 Credits)**

## M.Ed. Semester- II

| S. No. | Course Credit | Course Code | Course Title | Total Marks | Credits (Theory/ Tutorial/ Practicum) | Practical | Class Teaching / Field Based Activity Hours per week | Internal Assessment Weightage | External Assessment Weightage |
|---|---|---|---|---|---|---|---|---|---|
| 9 | 4 | SOE010208C3014 | Philosophical Foundations of Education | 100 | 4 | 0 | 4 | 30% | 70% |
| 10 | 4 | SOE010209C3014 | Sociological Foundations of Education | 100 | 4 | 0 | 4 | 30% | 70% |
| 11 | 4 | SOE010210C3014 | Curriculum Studies | 100 | 4 | 0 | 4 | 30% | 70% |
| 12 | 4 | SOE010211C3014 | Teacher Education | 100 | 4 | 0 | 4 | 30% | 70% |
| 13 | 2 | SOE010212C0022 | Academic Writing | 50 | 0 | 2 | 4 | 60% | 40% |
| 14 | 2 | SOE010213C0022 | Internship and Field Attachment | 50 | 0 | 2 | 4 | 60% | 40% |
| 15 | 2 | SOE010214C0022 | Dissertation Part-II | 50 | 0 | 2 | 4 | 60% | 40% |
| 16 | 4 | | **Taken from other Department / MOOC** | 100 | 4 | 0 | 4 | 30% | 70% |
| **Total** | **26** | | | **650** | **20** | **06** | **32** | | |

**Practicum/ Hands on/ Students Activity / Seminar/ Workshop/etc; during Practicum hours** **Number of days=100**

- **1 credit Theory/ Tutorial/ Practicum=16 hours in a semester**
- **1 credit practical=32 hours in a semester**
- **1 credit=25 Marks**
- **Viva-Voce exam for course 13, 14 & 15 will be conducted by the external examiner at the end of the semester and weightage will be 40% external & 60% Internal.**

**Internship Programme :**

- Internship should be organized in such way that all students' engagement for a continuous period of 2 weeks in a teacher education institute for field experience associated with the specialization choose. Since the M.Ed. programme structure proposed in this reports is associated on schools and teacher education institutions (and other sites) based activity, the M.Ed. calendar should be development keeping in mind the schedule of these institutions.
- **A student has to take 4 credits General Elective Course from other department course/ MOOC approved by C.U.H/ U.G.C**
- **General Elective Courses Offered by M.Ed. to other department : Introduction to Academic Writing (4 Credits);**
  **:Educational Leadership and Management (4 Credits)**

## M.Ed. Semester- III

| S. No. | Course Credit | Course Code | Course Title | Total Marks | Credits (Theory/ Tutorial/ Practicum) | Practical | Class Teaching / Field Based Activity Hours per week | Internal Assessment Weightage | External Assessment Weightage |
|---|---|---|---|---|---|---|---|---|---|
| 17 | 4 | SOE010315C3014 | Advance Research Methodology | 100 | 4 | 0 | 4 | 30% | 70% |
| 18 | 4 | SOE010316C3014 | Inclusive Education: Gender, Disability and Marginalization | 100 | 4 | 0 | 4 | 30% | 70% |
| 19 | 2 | **Any one of the following** | | 50 | 2 | 0 | 2 | 30% | 70% |
| | | SOE010317C2002 | Institutions, Systems and Structures at Elementary Stage | | | | | | |
| | | SOE010318C2002 | Institutions, Systems and Structures at Secondary Stage | | | | | | |
| 20 | 2 | **Any one of the following** | | 50 | 2 | 0 | 2 | 30% | 70% |
| | | SOE010319C2002 | Stage Specific Status, Issues and Concerns at Elementary Stage | | | | | | |
| | | SOE010320C2002 | Stage Specific Status, Issues and Concerns at Secondary Stage | | | | | | |
| 21 | 2 | **Any one of the following** | | 50 | 2 | 0 | 2 | 30% | 70% |
| | | SOE010321C2002 | Practice Relating to Curriculum, Pedagogy and Assessment at Elementary Stage | | | | | | |
| | | SOE010322C2002 | Practice Relating to Curriculum, Pedagogy and Assessment at Secondary Stage | | | | | | |
| 22 | 2 | SOE010323C2002 | Environmental Education | 50 | 2 | 0 | 2 | 30% | 70% |
| 23 | 4 | SOE010324C0044 | Internship in Specialized Area | 100 | 4 | 0 | 8 | 60% | 40% |
| 24 | 2 | SOE010325C0022 | Dissertation Part-III | 50 | 2 | 0 | 4 | 60% | 40% |
| **Total** | 22 | | | 550 | 22 | 0 | 28 | | |
| **Practicum/ Hands on/ Students Activity / Seminar/ Workshop/etc: during Practicum hours** | | | | **Number of days=100** | | | | | |
| **1 credit Theory/ Tutorial/ Practicum=16 hours in a semester**<br>**1 credit practical=32 hours in a semester**<br>**1 credit=25 Marks**<br>**Viva-Voce exam for course 23 & 24 will be conducted by the external examiner at the end of the semester and weightage will be 40% external & 60% Internal.** | | | | | | | | | |
| **General Elective Courses offered by M.Ed. to other department : Art of Teaching (4 Credits)** | | | | | | | | | |

M. Ed. Semester- IV

| S. No. | Course Credit | Course Code | Course Title | Total Marks | Credits (Theory/ Tutorial/ Practicum) | Practical | Class Teaching / Field Based Activity Hours per week | Internal Assessment Weightage | External Assessment Weightage |
|---|---|---|---|---|---|---|---|---|---|
| 25 | 4 | SOE010426C3014 | Recent Trends in Teacher Education | 100 | 4 | 0 | 4 | 30% | 70% |
| 26 | 4 | **Elective Course-I (Choose any one)** | | 100 | 4 | 0 | 4 | 30% | 70% |
| | | SOE010427DCEC3014 | Educational Technology | | | | | | |
| | | SOE010428DCEC3014 | Education of the Disadvantaged Groups | | | | | | |
| | | SOE010429DCEC3014 | Personality Development and Communication Skills | | | | | | |
| | | SOE010430DCEC3014 | Educational Measurement and Evaluation | | | | | | |
| 27 | 4 | **Specialization of course -Elective-II (Choose any one)** | | 100 | 4 | 0 | 4 | 30% | 70% |
| | | SOE010431DCEC3014 | Educational Policy, Economics and Planning at Elementary Level | | | | | | |
| | | SOE010432DCEC3014 | Educational Policy, Economics and Planning at Secondary Level | | | | | | |
| 28 | 4 | **Specialization of course -Elective-III (Choose any one)** | | 100 | 4 | 0 | 4 | 30% | 70% |
| | | SOE010433DCEC3014 | Educational Management, Administration & Leadership at Elementary Level | | | | | | |
| | | SOE010434DCEC3014 | Educational Management, Administration & Leadership at Secondary Level | | | | | | |
| 29 | 4 | **Elective Course-IV (Choose any one)** | | 100 | 4 | 0 | 4 | 30% | 70% |
| | | SOE010435DCEC3014 | Value Education | | | | | | |
| | | SOE010436DCEC3014 | Distance and Open Learning | | | | | | |
| | | SOE010437DCEC3014 | Comparative Education | | | | | | |
| | | SOE010438DCEC3014 | Guidance and Counselling | | | | | | |
| 30 | 4 | SOE010439C3014 | Dissertation | 100 | 0 | 4 | 8 | 60% | 40% |
| Total | 24 | | | 600 | 20 | 4 | 28 | | |

- **1 credit Theory/ Tutorial/ Practicum=16 hours in a semester**
- **1 credit practical=32 hours in a semester**
- **1 credit=25 Marks**
- Viva-Voce exam for course 29 will be conducted by the external examiner at the end of the semester and weightage will be 20% external viva-voce, 20% Internal & 60% Report writing.
- **General Elective Courses offered by M.Ed. to other department**
  - **Introduction to Counselling (4 Credits)**
  - **Inclusive Education (4 Credits)**

## List of General Elective Course (Offered to Other Department)

| Sr. No. | Semester | Course Code | Paper Title |
|---|---|---|---|
| 1 | First | SOE010140GEC3014 | Personality Development |
| 2 | Second | SOE010241GEC3014 | Introduction to Academic Writing |
| 3 | Second | SOE010242GEC3014 | Educational Leadership and Management |
| 4 | Third | SOE010343GEC3014 | Art of Teaching |
| 5 | Forth | SOE010444GEC3014 | Introduction to Counselling |
| 6 | Forth | SOE010445GEC3014 | Inclusive Education |

# Syllabus-M.Ed.

# Semester-II

| Year | I | COURSE CODE:SOE010208C3014<br>PHILOSOPHICAL FOUNDATIONS OF EDUCATION | Credit | 4 |
|---|---|---|---|---|
| Semester | II | | Marks | 100 (External : 70+Internal: 30) |

**Objectives**

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

- explain about the concept and nature of philosophy
- explain about various branches of Philosophy
- know about the concept and various types of knowledge.
- understand the relationship between Philosophy and Education
- understand the educational implications of various schools of philosophy and views of thinkers on Education

| Teaching Scheme (session)* | | | | Total (L+T+P) | Examination Scheme | | |
|---|---|---|---|---|---|---|---|
| Unit | L | T | P | | Internal Assessment | External Assessment | Total Marks |
| I | 12 | 4 | 0 | 16 | 30 | 70 | 100 |
| II | 12 | 2 | 1 | 15 | | | |
| III | 12 | 3 | 2 | 17 | | | |
| IV | 12 | 3 | 1 | 16 | | | |
| Total | 48 | 12 | 04 | 64 | 30 | 70 | 100 |

**Course Content / Syllabus**

**Unit-1** **Conceptual Understanding of Philosophy**

- Concept and nature of Philosophy
- Concept of Educational Philosophy and Philosophy of Education
- Relationship between Education and Philosophy.
- Branches of Philosophy: Metaphysics, Epistemology and Axiology and their implications for education.
- Knowledge: Concept, nature and types of knowledge

**Unit-2** **Indian Schools of Philosophy**

**Indian Schools of Philosophy with special reference to concepts of Knowledge, reality and values and their educational implications for aims of education, curriculum and methods of teaching:**

- Sankhya

| | |
|---|---|
| | • Vedanta<br>• Buddhism<br>• Jainism |
| **Unit-3** | **Western Schools of Philosophy** |
| | **Western Schools of Philosophy with special reference to concepts of Knowledge, reality and values and their educational implications for aims, curriculum and methods of teaching:**<br>• Idealism<br>• Naturalism<br>• Pragmatism<br>• Existentialism |
| **Unit-4** | **Modern Philosophy and Indian Educational Thinkers** |
| | • **Modern Concept of Philosophy: Logical Analysis, Logical Empiricism and Positive Relativism (Morris L. Prigge)**<br>• **Indian Thinkers**<br>  • Swami Vivekanand<br>  • Tagore<br>  • Aurobindo<br>  • Mahatma Gandhi |
| **Transactional Strategies** | **Lectures, dialogues, discussions, debates for comparisons, assignments in the form of essay, projects etc.** |

**Internal Assessment Strategies :**
**A total of thirty marks have been allotted under Internal Assessment. The nature of the activity, mode and weightage of marks are as follows.**

| S. No. | Activity | Mode | Weightage of Marks |
|---|---|---|---|
| 1 | Two Sessional tests will be conducted (Better one will be considered) | Test | 10 |
| 2 | Preparation of an assignment on various topics and it is followed by presentation in the classroom (Group activity) & Practicum | Assignment & Presentation (PPT) | 05-10 |
| 3 | Percentage of attendance | | 05 |
| | **Total Marks** | | 30 |

**Practicum :**

- Organize a drama/play on it. Write a script on Educational development in ancient India after classroom discussion on the script.

- Students will be required to submit a long essay of 1500 – 2000 words on a philosophical topic to the supervisor
- Visit any school claim to run on Gurukul principles and reflect critically on how the principles are translated into action (write in about 500-700 words).
- Identify the different instruments of knowledge used by a proficient teacher in a classroom situation and explain them briefly

**Suggested Readings:**


- Aggarwal, J.C. (2013). *Basic ideas in education*. New Delhi: Shipra Publications.
- Bailey, Richardet. al. (2010). *Philosophy of education*. U. S. A.: Sage Publication Ltd.
- Barrow, R. (2010). Schools of Thought in Philosophy of Education. In Bailey, R. Barrow, Carr, D., & McCarthy, C (ed.). *The SAGE Handbook of Philosophy of Education*. London: Sage Publications.
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- Coulby, D. & Zambeta, G. (2005). *Globalization & nationalism in education*. New York: Routledge.
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- Kaur. (2018). Philosophical and sociological perspectives in education. New Delhi:ABD Publishers.
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- Kumar, A. (2015). *Philosophical perspective of education*. New Delhi: APH Publishing Corporation.
- Mathur S S. (2008). *A Sociological approach to Indian Education*. Agra: Vinod Pustak Mandir.
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- Phillips, D.C. (2010). What is Philosophy of Education? In Bailey, R. Barrow, Carr, D., & McCarthy, C. (ed.). *The SAGE Handbook of Philosophy of Education*. London: Sage Publications.
- Pring, R. (2010). The philosophy of education and educational practice. In the sage handbook of philosophy of education. Bailey, R. Barrow, Carr, D., & McCarthy, C. (ed.). London: Sage Publications.
- Siegel, H. (2010). Knowledge and truth. In Bailey, R. Barrow, Carr, D., & McCarthy, C. (ed.). *The sage handbook of philosophy of education*. London: Sage Publications.
- Singh, Y. K. (2014). *Education philosophy of Mahatma Gandhi*. New Delhi: APH Publishing Corporation.
- Sodhi, T.S. & Suri, A. (1998). *Philosophical and sociological foundation of education*. Patiala: Bawa Publications.
- Vallikkat, S. (2015). *Philosophy of education*. New Delhi: APH Publishing Corporation.
- Vashishtha, U. C. (2011). *Educational philosophy*. New Delhi: APH Publishing Corporation.
- Walia, J.A. (2011).*Modern Indian education and its problems*. Gopal Nagar, Jalandhar City: Paul Publishers.
- Walia, J.A. (2011). *Philosophical, sociological and economic bases of education*. Jalandhar: Ahim Paul Publishers.

| Year | I | COURSE CODE:SOE010209C3014<br>SOCIOLOGICAL FOUNDATIONS OF EDUCATION | Credit | 4 |
|---|---|---|---|---|
| Semester | II | | Marks | 100 (External : 70+Internal: 30) |

**Objectives**

After the completion of this course the students will be able to

- understand the concept of educational sociology and sociology of education.
- know and understand Indian culture and socialization.
- understand the educational implications of social interactions.
- understand social change and how education helps in it.

| Teaching Scheme (session)* | | | | Total (L+T+P) | Examination Scheme | | |
|---|---|---|---|---|---|---|---|
| Unit | L | T | P | | Internal Assessment | External Assessment | Total Marks |
| I | 12 | 4 | 0 | 16 | 30 | 70 | 100 |
| II | 12 | 2 | 1 | 15 | | | |
| III | 12 | 3 | 2 | 17 | | | |
| IV | 12 | 3 | 1 | 16 | | | |
| **Total** | **48** | **12** | **04** | **64** | **30** | **70** | **100** |

**Course Content / Syllabus**

**Unit-1** — **Concept of Educational Sociology and Sociology of Education**

- Educational Sociology, sociology of education, Relationship of Sociology and Education,
- Social foundations of education
- Concepts, Factors influencing social organization – folk ways, mores; institutions; values
- Dynamic characteristics of social organization and its educational implications
- Social group inter-group relationship-group dynamics

**Unit-2** — **Social Interactions and their Educational Implications**

- Education as an institution and a social sub-system
- Major roles and status (Students, teachers and administrators interrelationship)
- Social stratifications-concepts of social stratification and its educational implications

| | |
|---|---|
| | • Constitutional Values: Equality, Freedom, Social Justice, Inclusiveness & Secularism<br>• Education of the socially and economically disadvantages sections of society with special reference to scheduled castes and scheduled tribes, women and rural population |
| **Unit -3** | **Education and Culture, Religion, Politics and Democracy** |
| | • Social Stratification; Concept and educational implications<br>• Role of education in cultural context<br>• Cultural determinants of education<br>• Education and cultural change<br>• Concept and Meaning of Socialization, Agencies of Socialization; Home, School, Community<br>• Socialization of child in Indian Context |
| **Unit-4** | **Social Change and Social Mobility: Meaning, Concept and Nature with Special Reference to India** |
| | • Social change; Meaning, Concept and educational Implications constraints to Social Change in India (Caste, Class, Ethnicity, Language, Religion, Regionalism<br>• Social Mobility<br>• Concept of Urbanization, Modernization, Westernization, Sanskritisation and Industrialization with special reference to Indian society and its educational implications. |
| **Transactional Strategies** | Lectures, discussions, sociometry, observation and report of a social setting |

**Internal Assessment Strategies :**

**A total of thirty marks have been allotted under Internal Assessment. The nature of the activity, mode and weightage of marks are as follows.**

| S. No. | Activity | Mode | Weightage of Marks |
|---|---|---|---|
| 1 | Two Sessional tests will be conducted (Better one will be considered) | Test | 10 |
| 2 | Preparation of an assignment on various topics and it is followed by presentation in the classroom (Group activity) & Practicum | Assignment & Presentation (PPT) | 05+10 |
| 3 | Percentage of attendance | | 05 |
| **Total Marks** | | | **30** |

**Practicum :**

- Visit a school to study the relationship of students, teachers, administration and staff of the school; and prepare a report based on your observations and experience.
- Study the contents of Geeta in Reference to teacher child relationship and education management.
- Socio-metric study of a class consisting of not less than 20 students. Prepare a report on entire activity.

**Suggested Readings:**


- Abrahan F. & Margan, J. (2002). *Sociological thought*. New Delhi: MC Millian India Ltd.
- Banks (2018). *An Introduction to Multicultural Education*: ND: Pearson
- Gore, M.S. (1984). *Education and modernization in India*. Jaipur: Rawat Publishers.
- Hanighurst, R.(1995). *Society and education*. Boston: Allyn and Bacon.
- Harlambos, M. (1997).*Sociology Theme and perceptive*. New Delhi: OUP.
- Jayapalan N. (2001). *Sociological theories*. New Delhi: Atlantic Publishers and Distributers
- Kamat, A.R. (1985). *Education and social change in India*. Bombay: Samaiya Publishing Co.
- Lal, R.B. & Palod, S. (2016). *Philosophical & Sociological perspectives of education* Meerut: R.Lall Publications
- M.H.R.D. (1990). *Towards an enlightened and human society*. New Delhi: Department of Education.
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- Maubnhein K. (1962). *An introduction to sociology of education*. London: Routledge.
- Mossish. Loor (1972). *Sociology of Education An Introduction*. London: George Laten and Unwin.
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- Singh, A (2018). *Emerging trends in education and future vision* New Delhi Omega Publications
- Singh, B.N. (2005) *Education: social change and economic development*. Jaipur: RBSA Publishers.
- Snedden, D. (2018). *A digest of educational sociology*. Australia: Trestle Publications
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- https://en.wikipedia.org/wiki/Sociology_of_education
- Duguan J.(2010) *Psychological and sociological foundation of education* Retrieved from https://www.scribd.com /doc/36337036/ Psychological -and-Sociological...




2.7.7 (A)

| Year | I | COURSE CODE:SOE010210C3014<br>CURRICULUM STUDIES | Credit | 4 |
|---|---|---|---|---|
| Semester | II | | Marks | 100 (External : 70+Internal: 30) |

**Objectives**

**After the completion of this course the students will be able to**

- Understand the concept of curriculum and its various types.
- Understand the concept, scope and principles of curriculum development
- Know various models and designs of curriculum development
- Understand how to critically evaluate the curriculum

| Teaching Scheme (session)* | | | | Total (L+T+P) | Examination Scheme | | |
|---|---|---|---|---|---|---|---|
| Unit | L | T | P | | Internal Assessment | External Assessment | Total Marks |
| I | 12 | 4 | 0 | 16 | 30 | 70 | 100 |
| II | 12 | 2 | 1 | 15 | | | |
| III | 12 | 3 | 2 | 17 | | | |
| IV | 12 | 3 | 1 | 16 | | | |
| **Total** | **48** | **12** | **04** | **64** | **30** | **70** | **100** |

**Course Content / Syllabus**

**Unit -1** **Conceptual Understanding of Curriculum**

- Meaning, definition and elements of curriculum
- Types of curriculum and curriculum approaches (Behavioral and Humanistic)
- Determinates of curriculum (Philosophical, Sociological and Psychological)
- Core, Integrated & spiral curriculum

**Unit -2** **Curriculum Development**

- Nature, purposes, scope and principles
- Principles of formulating aims, selecting content and learning experiences
- Models of curriculum developments:
  - ➢ Tyler's Model
  - ➢ Taba's Model
  - ➢ Olivia's Model

| | |
|---|---|
| | ➢ Doll's Model<br>➢ Sayle& Alexander's Model) |
| **Unit -3** | **Curriculum Design: Concept and Need** |
| | • Different curriculum designs- subject centered, experience centered, activity centered and core curriculum, hidden curriculum , spiral curriculum, integrated curriculum and their relevance<br>• Eclectic model of curriculum design |
| **Unit- 4** | **Curriculum Evaluation** |
| | • Concept of Curriculum evaluation<br>• Curriculum evaluation models: Scientific and modernist<br>• Methods of curriculum evaluation : Formative ,Summative and Interpretation of evaluation results<br>• Critical analysis of curriculum and teaching materials |
| **Transactional Strategies** | **Assignments and workshop on curriculum development and evaluation** |

**Internal Assessment Strategies :**

**A total of thirty marks have been allotted under Internal Assessment. The nature of the activity, mode and weightage of marks are as follows.**

| S. No. | Activity | Mode | Weightage of Marks |
|---|---|---|---|
| 1 | Two Sessional tests will be conducted (Better one will be considered) | Test | 10 |
| 2 | Preparation of an assignment on various topics and it is followed by presentation in the classroom (Group activity) & Practicum | Assignment & Presentation (PPT) | 05+10 |
| 3 | Percentage of attendance | | 05 |
| | **Total Marks** | | **30** |

**Practicum :**

- Critical appraisal of present curriculum in secondary schools of Haryana.
- Compare and prepare report on different curriculum prescribed by different boards at secondary level.

**Suggested Readings:**


- Bob, M.& Patricia, M. (1999). *Curriculum in Context*(Eds.). London: Paul Chapman Publishing.
- Chomsky, N (1986). *Knowledge of Language*. New York: Prager.
- Dewey. J. (...).*The Child and the Curriculum*. Chicago: University of Chicago Press.
- Ford, G.W. & Lawrence, P. (1964). *The structure of Knowledge and the curriculum*. Chicago: Rand McNally & Company.

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- Kelley, A.B. (1996) *The Curricular Theory and Practice* US: Harper and Row.
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- Margaret, K.T. (1999). *The open Classroom*. New Delhi: Orient Longman.
- Marsh, C.J. (2009). Key concepts for understanding curriculum. New York. Taylor and Francis.
- Nirantar (1997). *Developing a curriculum for rural women* New Delhi: Nirantar.
- Ornstein. A.C & Hunkins, F.P, (2018) *Curriculum: Foundations, Principles and Issues* (7th Ed.). New York: Pearson.
- Ornstein. A. C. (2011). Critical issues in Teaching. In Ornstein, Pajak, and Ornstein (Eds.). *Contemporary issues in Curriculum (5th Ed.)*. Ch.8, p. 75-93. New York: Pearson.
- Ornstein. P. & Ornstein. A.C. (2011). *Contemporary Issues in Curriculum* (5th Ed.). New York: Pearson.
- P.H. Phenix. (1964). *Realms of meaning*. New York: MacGraw-Hill
- Sarangapani, P. M. (2003). *Constructing school knowledge: An ethnography of learning in an Indian village*. New Delhi: Sage Publication Inc.
- Prema Clarke (2001) *Teaching & learning: The culture of pedagogy*. New Delhi: Sage Publication
- Slattery, P (2006) *Curriculum development in the postmodern era* (2nd Ed.). New York: Routledge.
- Steven H. Cahn (1970). *The philosophical foundation of education*. New York: Harper & Row Publishers.
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- Yadav. S. (2017). *Curriculum development and school*. Agra: Vinod Pustak Mandir

| Year | I | COURSE CODE:SOE01021IC3014<br>TEACHER EDUCATION | Credit | 4 |
|---|---|---|---|---|
| Semester | II | | Marks | 100 (External : 70+Internal: 30) |

**Objectives**

**After the completion of this course the students will be able to:**

- Understand the objectives of teacher education at various levels
- Familiarize with different modes of pre-service and in-service teacher education
- Familiarize and evaluate various components of a pre-service and in-service teacher education
- Know the role and functions of agencies of Teacher Education programs.

| Teaching Scheme (session)* | | | | Total (L+T+P) | Examination Scheme | | |
|---|---|---|---|---|---|---|---|
| Unit | L | T | P | | Internal Assessment | External Assessment | Total Marks |
| I | 12 | 4 | 0 | 16 | 30 | 70 | 100 |
| II | 12 | 2 | 1 | 15 | | | |
| III | 12 | 3 | 2 | 17 | | | |
| IV | 12 | 3 | 1 | 16 | | | |
| **Total** | **48** | **12** | **04** | **64** | **30** | **70** | **100** |

**Course Content / Syllabus**

**Unit-I** — **Introduction to Teacher Education**

- Concept, Need and Scope of Teacher Education
- Historical Development of Teacher Education (emphasis on Kothari Education Commission Report (1964-66), National Curriculum Framework (2005) in India
- Aims and Objectives of Teacher Education at
  - Elementary Level.
  - Secondary Level.
  - Higher Level.
- Quality Assurance in Teacher Education

**Unit-2** — **Structure, Curriculum and Modes of Pre-Service Teacher Education**

- Pre- Service Teacher Education: Concept, Nature, Objectives and Scope
- The structure of Teacher Education curriculum and its vision in curriculum documents of NCERT and NCTE.
- Components of Pre-Service Teacher Education: Foundation Courses, Subject Specialization and Pedagogy, Special Fields, School based Practicum and

| | |
|---|---|
| | Internship<br>• Modes of Pre -Service Teacher Education: Face to Face (Linear and Integrated), Distance and Online: relative merits and limitations.<br>• Needs of Innovation in Pre-service Teacher Education Programme |
| **Unit-3** | **Concept, Structure and Modes of In-service Teacher Education** |
| | • In-service Teacher Education; concept, Need, Objectives and areas of Professional development.<br>• Types of In-Service courses for Teachers; Orientation and refresher Courses, workshops, seminars, Internship and Summer Institutes.<br>• Structure for In-service Teacher Education; Sub –District, District, State, Regional and National level Agencies and institutions.<br>• Modes and Models of In-service teacher education: Modes- Face to face, Distance Mode, Online and Mixed Mode. Models- Induction, One shot, Recurrent, Cascade, Multisite, School based and coursework. Scope, Merits and limitations of each of them. |
| **Unit-4** | **Agencies of Teacher Education: Role and Functions** |
| | • National Agency: UGC (University Grants Commission), NUEPA, NCTE and NCERT<br>• State level Agencies- DIET and SCERT.<br>• Role of NCERT and NCTE in Teacher Education.<br>• Current Trends in Teacher Education.<br>• Managing Teacher Education Challenges in 21st century. |
| **Transactional Strategies** | • Study of Reports of in-service teacher education programs organized by various agencies of education in India.<br>• workshop on development and conduct of an in-service teacher education program |

**Internal Assessment Strategies :**

**A total of thirty marks have been allotted under Internal Assessment. The nature of the activity, mode and weightage of marks are as follows.**

| S. No. | Activity | Mode | Weightage of Marks |
|---|---|---|---|
| 1 | Two Sessional tests will be conducted (Better one will be considered) | Test | 10 |
| 2 | Preparation of an assignment on various topics and it is followed by presentation in the classroom (Group activity) & Practicum | Assignment & Presentation (PPT) | 05+10 |
| 3 | Percentage of attendance | | 05 |
| **Total Marks** | | | 30 |

**Practicum :**

- Prepare a report on role of various central and state agencies in Teacher Education.
- Prepare a project on challenges in Teacher Education in 21st Century.
- Any other activity assigned by the Institution

**Suggested Readings:**


- Batra, P. (2014). Problematizing teacher education practice in India. Developing a research agenda. *Education as Change, 18*, S5- S18.
- Behari, A. & Menon, S. (2009). National Curriculum Framework 2005. Implications for Teacher Education. In M. A. Siddiqui, A. K. Sharma & G. L. Arora (Eds), *Teacher Education: Reflections towards Policy Formulation*. New Delhi: NCTE.
- Cochran Smith, M. (2008). Handbook of research on teacher education: Enduring questions in changing contexts (3rd ed.). New York: Routledge
- Devedi, Prabhakar (1980). *Teacher Education- A Resource Book*. New Delhi: NCERT.
- Govt. of India (1966). *Education and National Development*, New Delhi: Report of Education Commission.
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- Mangla, S. (2000). *Teacher Education: Trends and Strategies*. New Delhi: Radha Publishing.
- MHRD (1985). *Report of the National Commission on Teachers* (1983-85). New Delhi: Govt. of India.
- MHRD (1986). *National Policy of Education and Program of Action*. New Delhi: Govt. of India.
- MHRD (1992). *Program of Action*. New Delhi: Department of Education, Govt. of India.
- MHRD (2012). *Vision of teacher education in India: quality and regulatory perspective*. New Delhi: Govt. of India.1 & 3.
- NCERT (2006). *Position paper on teacher education*. New Delhi: National Council for Educational Research and Training.
- NCTE (2009). *National curriculum framework for teacher education: Towards preparing professional and humane teachers*. New Delhi: NCTE.
- Null, J. W. & Bohan, C.H. (2005). Teacher education curriculum: what, how and why. *Curriculum and teaching dialogue* pp 39-49.
- Pollard, A. (2002). *Reflective teaching: Effective and evidence informed professional practice*. London: Continuum.
- Purnima, K. (2018). *Teacher education in 21st century. ND:* APH Publishing Corporation
- *Sharma (2017). Teaching effectiveness. ND:* APH Publishing Corporation.
- Sharma, R.A. (2005). *Teacher Education*. Meerut: Loyal Book Depot.
- Sharma, S.P. (2005). *Teacher Education*. New Delhi: Kanishka Publishers.
- Shrimali, K.L. (1954). *Better teacher education*. New Delhi: Ministry of Education Govt. of India
- Sikula, J., Buttery, T. J. & Guyton, E. (Ed.) (1996). *Handbook of Research on Teacher Education*. USA: Macmillan
- Udyaveer (2006). *Modern Teacher Training*. New Delhi: Anmol Publications.




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| Year | I | COURSE CODE:SOE01021 2C0022<br>ACADEMIC WRITING | Credit | 2 |
|---|---|---|---|---|
| Semester | II | | Marks | 50 |

**Objectives:**

**After the completion of this course the students will be able to:**

- draft and write applications, professional letters and e- mail etc.
- differentiate various kinds of informal and formal writings and writing styles
- reflect on essential requirements of academic writing and distinguish a good academic writing from others.
- identify and analyze academic sources and referring those sources of learning.
- cite and acknowledge various sources of learning.
- edit one's own and peer's writing work

| Teaching Scheme (session)* | | | | Total (L+T+P) | Examination Scheme | | |
|---|---|---|---|---|---|---|---|
| Unit | L | T | P | | Internal Assessment | External Assessment | Total Marks |
| I | 00 | 0 | 0 | 16 | 30 | 20 | 50 |
| II | 00 | 0 | 0 | 16 | | | |
| **Total** | **00** | **00** | **00** | **32** | **30** | **20** | **50** |

**Workshop on Academic Writing Skill**

- Difference between an article, essay and a research paper
- Difference between a seminar, conference, symposium, colloquium and a workshop
- Identify and discuss various sources of knowledge and learning
- Write a paragraph/essay and an article on any topic of your interest and edit your own writing. Prepare a report on it.
- Prepare your resume/effective profile for an interview
- Prepare a professional letter and an official mail on any topic.
- Write a professional report of any workshop and seminar
- Analyze a Newspaper and its contents
- Critically analyze any one research paper on the topic of your interest and write a report on it.
- Book Review: Any Text Book/Novel or Book

**Transactional and Evaluation Strategies**

**Internal Assessment Strategies :**

**A total of thirty marks have been allotted under Internal Assessment. The nature of the activity, mode and weightage of marks are as follows.**

| S. No. | Activity | Mode | Weightage of Marks |
|---|---|---|---|
| 1 | 1 Practical Activities | Assignment & Presentation (PPT) | 15 |
| 2 | Peer Review writing work | Assignment & Presentation (PPT) | 7.5 |
| 3 | Percentage of attendance | | 2.5 |
| **Total Marks** | | | **30** |

**Mode of transaction of this course will be a Discussions, workshop, Project and Assignment.**

- The student will maintain a file of the record related to activities performed.
- Peer Review of various writing work done by students

**References:**


- Academic English: Writing Specialization (2019). Retrieved from https:// www.coursera.org/specializations/academic-english.
- Bailey. S. (2015). *Academic writing A Handbook for International Students*. London and New York: Rutledge.
- Eric Hayot (2014). *The Elements of Academic Style: Writing for the Humanities*. U.S: Columbia University Press.
- Labaree. R.V. (2009). Organizing your social sciences research paper Academic writing style. Retrieved from libguides.usc.edu/writing guide/academic writing
- Murray, N. (2012). *Writing essays in english language and linguistics*. UK: Cambridge University Press.
- Olivia, V. (2019). An introduction to academic writing: Characteristics and common mistakes to avoid. Retrieved from https:// www.thoughtco.com /what-is - academic-writing-1689052

| Year | I | COURSE CODE:SOE010213C0022<br>INTERNSHIP AND FIELD ENGAGEMENT | Credit | 2 |
|---|---|---|---|---|
| Semester | II | | Marks | 50 |

**Objectives**

Internship program is aimed at providing practice of the concepts and skills learned in the theoretical papers in the field of education such as schools, teacher education institutes apart from where the scholar is studying.

**Methodology:**

Internship should be organized in such a way that involves all students' engagement for a continuous period of 28 days in a school/ teacher education institute for field experience associated with the specialization that students choose. Since the M.Ed. Programme structure proposed in this report is associated with schools and teacher education institutions (and other sites) based activities, the M.Ed. Calendar should be developed keeping in mind the schedule of these institutions.

**Examination Scheme**

| Internal Assessment | External Assessment | Total Marks |
|---|---|---|
| 30 | 20 | 50 |
| **30** | **20** | **50** |

**Plan of Activities:**

| Sr. No. | Phase | Name of Activity | Duration |
|---|---|---|---|
| 1 | Part -One | Pre Internship training( Each student is required to deliver at least one lecture to B.Ed. students of School of Education) | 01 Week |
| 2 | Part - Two | Observation of Internship Activities of B.Ed. students | 01 Week |
| 3 | Part-Three | Attachment in Teacher Training Institution. | 02 Week |
| | | **Total Duration of Internship** | **04 Week** |

**Part-A:**

This phase is preparatory in nature aimed at providing students with necessary guidance and skills enriching their field based engagement. In this phase each M.Ed. student is required to take a minimum of One Pedagogy paper class in the B.Ed. course of the Department.

**Part-B:**

Each student is required to observe the internship activities of B.Ed. students attached to a high school / higher secondary school for school based internship programme. The students are required to observe at-least five lessons of B.Ed. students and should maintain a separate observation record. The students are also expected to familiarize himself/herself with the school practices including school administration, organization of curricular and co-curricular activities.

**Part-C:**

Each M.Ed. student is required to take a minimum of 06 classes in B.Ed. college/DIET either in core papers or in optional papers or both taken together under the close mentorship of teacher educators of the institution selected for internship related activities. The students are also expected to familiarize himself/herself with the college

practices including administration, organization of curricular and co-curricular activities. The students are also expected to collectively organize at least one activity. The suggestive list are as follows:

- Teaching learning material making competition
- Drawing / poster making competition on themes related to education
- Organize an innovative teaching learning material making workshop
- Debate/ Essay writing/ Slogan competition.
- NukkadNatak
- Cleanliness Drive
- Workshop on Micro-teaching Skills

**Internal & External Assessment Strategies :**

**A total of thirty marks have been allotted under Internal Assessment. The nature of the activity, mode and weightage of marks are as follows.**

| Internal Assessment Strategies | | | | Internal Assessment Strategies | |
|---|---|---|---|---|---|
| **S. No.** | **Activity** | **Mode** | **Weightage of Marks** | **Mode** | **Weightage of Marks** |
| 1 | Part-A | Presentation of Report (PPT) | 10 | Viva-Voce | 10 |
| 2 | Part-B | Presentation of Report (PPT) | 10 | Presentation of Report | 10 |
| | Part-C (One) | Presentation of Report (PPT) | 7.5 | | |
| 3 | Percentage of attendance | | 2.5 | | |
| **Total Marks** | | | **30** | | **20** |

| Year | I | COURSE CODE:SOE010214C0022<br>DISSERTATION-II | Credit | 2 |
|---|---|---|---|---|
| Semester | II | | Marks | 50 |

**Objectives**

**After the completion of the dissertation work , students will be able to:**

- Understand the process of conducting research.
- Know various statistical techniques used for analysing the data.
- Critically analyse the related literature
- Contribute to new knowledge.
- Learn the process of publishing research output
- Suggest desirable changes in their area of study.

| Examination Scheme | | |
|---|---|---|
| Internal Assessment | External Assessment | Total Marks |
| 30 | 20 (Report Presentation & Viva-Voce) | 20 |
| **30** | **20** | **50** |

**Transactional Strategies**

In this part of Dissertation each student is required to undertake the following activities under the guidance of their respective supervisors:

- Preparation of Detailed synopsis
- Review of related literature
- Selection/ development of tool (s) /instrument (s) for data collection
- Planning for data collection
- Classroom seminar

**Internal Assessment Strategies :**

**A total of thirty marks have been allotted under Internal Assessment. The nature of the activity, mode and weightage of marks are as follows.**

| S. No. | Activity | Mode | Weightage of Marks |
|---|---|---|---|
| 1 | Report Writing | Report Writing | 15 |
| 2 | Presentation | PPT | 10 |
| 3 | Viva-Voce | | 05 |
| **Total Marks** | | | **30** |

# GENERAL ELECTIVE COURSE

| Year | I | GENERAL ELECTIVE COURSE<br>COURSE CODE: SOE01024IGEC3014<br>INTRODUCTION TO ACADEMIC WRITING | Credit | 4 |
|---|---|---|---|---|
| Semester | II | | Marks | 100 |

**Objectives:**

- Write or draft professional letters and mail etc.
- Use & differentiate different kinds of writings and writing styles
- Reflect on essential requirements of academic writing & distinguish a good academic writing from others.
- Analyze academic sources and how to refer them.
- Cite a source, paraphrase and acknowledge the source & edit one's own writing.
- Write a research article, review article, thesis chapter and other related academic research text,
- Demonstrate understanding of the ways in which writers, texts and readers interact,

| Teaching Scheme (session)* | | | | Total (L+T+P) | Examination Scheme | | |
|---|---|---|---|---|---|---|---|
| Unit | Lecture (L) | Tutorial (T) | Practicum (P) | | Internal Assessment | External Assessment | Total Marks |
| I | 12 | 4 | 0 | 16 | 30 | 70 | 100 |
| II | 12 | 2 | 1 | 15 | | | |
| III | 12 | 3 | 2 | 17 | | | |
| IV | 12 | 3 | 1 | 16 | | | |
| Total | 48 | 12 | 04 | 64 | 30 | 70 | 100 |

**Workshop on Academic Writing Skill**

- Write a paragraph on any topic of your interest and edit one's own writing. Prepare a report on it.
- Prepare a programme on reflective thinking and negotiation skill and conduct it in school.
- Prepare your resume/effective profile for an interview.
- Prepare a professional letter and mail on any topic.
- Write a professional report of any workshop and seminar

**Course Content / Syllabus**

**Unit-1** — **Introduction to Academic Research Writing**

- Concept meaning of academic research
- Need and importance of academic research
- Nature of academic research

**Unit-2** — **Structure of :**

- Research article,
- Review article,
- Thesis chapter and other related academic research text.

| | |
|---|---|
| Unit-3 | **Review Writing and Writing of Project Proposal** |
| | • Publication Manual of the American Psychological Association or any, as the other subject demand.<br>• Writing project proposal |
| Unit-4 | **Seminar and Conference Presentation** |
| | • Writing and presentation of full length papers in seminar/ conference<br>• Publication procedure of research article and papers<br>• Patent policy (Intellectual property Rights India) |

**Transactional Strategies**

**Note:**

**1. The student will maintain a file of the record related to activities performed.**

**2. Mode of transaction of this course will be a workshop.**

**Internal Assessment Strategies :**

**A total of thirty marks have been allotted under Internal Assessment. The nature of the activity, mode and weightage of marks are as follows.**

| S. No. | Activity | Mode | Weightage of Marks |
|---|---|---|---|
| 1 | Two Sessional tests will be conducted (Better one will be considered) | Test | 10 |
| 2 | Preparation of an assignment on various topics and it is followed by presentation in the classroom (Group activity) & Practicum | Assignment & Presentation (PPT) | 05+10 |
| 3 | Percentage of attendance | | 05 |
| **Total Marks** | | | **30** |

**Practicum :**

- The course consists of two parts: The first part is a series of seminars in which participants analyze texts (their own and others), perform small writing tasks and take part in discussions about aspects of the texts. In the second part, the participants' work individually with a partner and instructor on a text they themselves are writing for eventual publication
- Each student should be prepared to bring FIVE well-written published academic article in your field (to use as models) and whatever notes, earlier drafts you need to get started on a manuscript.
- Student will write assignments in order to develop a full-length article or conference presentation by the end of the course. Working from your own areas of interest, the course moves progressively from short writing tasks to a full-length paper.

**Suggested Readings:**


- Academic English Writing Specialization (2019) Retrieved from https // www.coursera.org/specializations/academic-english.
- Bailey. S (2015). *Academic writing: A Handbook for International Students*. London and New York. Routledge.
- Booth. W. I. (2008). *The craft of research*. Chicago. Chicago University Press
- Chicago Manual of Style (2005) Fifteenth Edition. Chicago. University of Chicago Press.
- Day, R. and Castel, B. (2012).*How to write and publish a scientific paper*. (7th Ed ). Cambridge University Press.
- Eric Hayot (2014). *The Elements of Academic Style: Writing for the Humanities*. US: Columbia University Press.
- Hall, G. M, ed. (2008).*How to write a paper*, (4th Ed.) Malden, MA: Blackwell.
- Labaree, R.V (2009). Organizing your social sciences research paper: Academic writing style. Retrieved from libguides.usc.edu/writing guide/academic writing
- Michaelson, H. B. (1990).*How to write and publish engineering papers and reports*, (3rd Ed.). Phoenix Oryx Press
- Murray, N (2012). *Writing essays in english language and linguistics*. UK: Cambridge University Press.
- Olivia, V (2019). An introduction to academic writing: Characteristics and common mistakes to avoid. Retrieved from https:// www. thoughtco.com /what-is -academic-writing-1689052
- Publication Manual of the American Psychological Association (2001). Washington: APA.
- Swales, J M and Feak, C. B (2000). *English in today's research world A writing guide*. Michigan: University of Michigan

| Year | II | COURSE CODE:SOE010242DCEC3014<br>EDUCATIONAL LEADERSHIP AND MANAGEMENT | Credit | 4 |
|---|---|---|---|---|
| Semester | IV | | Marks | 100 (Theory: 70, Internal: 30) |

**Objectives**

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

- Know and understand the concepts of educational management, administration and leadership
- Understand various styles of leadership
- Develop some leadership qualities in themselves
- Understand educational administration in India at local, state and central level

| Teaching Scheme (session)* | | | | Total (L+T+P) | Examination Scheme | | |
|---|---|---|---|---|---|---|---|
| Unit | Lecture (L) | Tutorial (T) | Practicum (P) | | Internal Assessment | External Assessment | Total Marks |
| I | 12 | 4 | 0 | 16 | 30 | 70 | 100 |
| II | 12 | 2 | 1 | 15 | | | |
| III | 12 | 3 | 2 | 17 | | | |
| IV | 12 | 3 | 1 | 16 | | | |
| **Total** | **48** | **12** | **04** | **64** | **30** | **70** | **100** |

**Course Content / Syllabus**

**Unit-I** — **Conceptual Understanding of Educational Management**

- Concept, Needs, Objectives & Scope of Educational Management
- Approaches and Principles of Educational Management
- Concept of Educational Management Human Beings as inputs, Process & Product inputs
- Educational Manager: Functions, Roles, Skills & Competencies
- Managerial Creativity, Managerial Ethics

**Unit-2** — **School Management and Communication**

- Role and functions of Headmaster/ Principal/ Teacher: Basic functions of Administration, Planning, Organizing, Directing and Controlling in School Management and Administration
- Educational Supervision as Service Activity: Process, Functions, Planning, Organizing and Implementing Supervisory Programmes at secondary

| | |
|---|---|
| | level<br>• Process, Human Relations Approach to Management.<br>• Types of Communication<br>• Methods and Devices of Communication<br>• Selection of Appropriate Communication Strategies<br>• Barriers of Communication |
| Unit-3 | **Leadership in Education & Theories of Leadership** |
| | • Concept of Leadership, Leader and Manager,<br>• Leadership Traits and Skills<br>• Functions and Styles of Leadership<br>• Approaches of Leadership: Trait, Transformational, Transactional, Value-Based, Cultural, Psychodynamic, Charismatic, Community based and Social<br>• Hersey and Blanchard's Situational Theory. |
| Unit- 4 | **Educational Administrative Bodies in India at National Level: Role & Functions** |
| | • University Grant Commission (UGC)<br>• National Council of Educational Research and Training (NCERT)<br>• National University of Educational Planning and Administration (NUEPA)<br>• Ministry of Human Resource Development (MHRD)<br>• National Council for Teacher Education (NCTE)<br>• Central Advisory Board For Education (CABE) |
| Transactional Strategies | Lectures, field visits to various educational institutions, case studies, assignments, discussions |

**Internal Assessment Strategies :**

**A total of thirty marks have been allotted under Internal Assessment. The nature of the activity, mode and weightage of marks are as follows.**

| S. No. | Activity | Mode | Weightage of Marks |
|---|---|---|---|
| 1 | Two Sessional tests will be conducted (Better one will be considered) | Test | 10 |
| 2 | Preparation of an assignment on various topics and it is followed by presentation in the classroom (Group activity) & Practicum | Assignment & Presentation (PPT) | 05-10 |
| 3 | Percentage of attendance | | 05 |
| Total Marks | | | 30 |

**Practicum :**

- Compile articles from newspapers, magazines, and internet discussing present policies and operational strategies of central and state Govt. for secondary education. Prepare a report of entire activity.
- Review research on educational management or management of secondary schools which are used in other countries but not in India.
- Evaluation of management of SSA activities in a district.
- Collect data from relevant sources on student & teachers ratio for secondary level school of your district. Is it according to provision of RTE act? Prepare a report and send it to authorities.
- Examine the effectiveness of any one programme run by central Govt. for secondary students. Present the report in a classroom seminar.

**Suggested Readings:**


- Altrichter, H. & Elliot, J. (2000). *Images of educational change*. England: Buckingham Open University.
- Bhattacharya, D K. (2011). *Managing People*, New Delhi: Excel Books
- Bush T., L., B. (2003). *The principles and practice of educational management*, (Ed.). New Delhi: Sage Publications.
- Bush, T. (2013) *Educational management, administration & leadership* New Delhi: Sage Publications.
- Chauhan,S.(2012). *Educational management*. New Delhi. Pearson Publication.
- Dawra, S. (2003). *Monogement thought*. New Delhi: Mohit Publication.
- Hariopal, K. (2001). *Management of organizational change*. New Delhi: Response Books.
- Lunenburg, F.C. & Orenstein, A.C.(2012).*Educational administration- Concept & practices*, USA: Wadsworth, Cengage Learning Solutions, Canada.
- Luthans, F. (2005). *Organisational behaviour*. New York: McGraw-Hills Inc.
- McCaffery, P. (2004). *The higher education manager's handbook* New York and Canada: Routledge.
- Nair, S.R. (2004).*Organizational behaviour- Texts and cases*. Mumbai: Himalaya Publication.
- Nangia, S.B. (2009) *Educational administration*. New Delhi APH Publishing Corporation Publishing House.
- Northouse, P. (2010) *Leadership theory and practice*. New Delhi: Sage Publications.
- Owens, R C. (2017). Organizational *behaviour in education*. Boston Allyn and Bacon.
- Pandya, S.R (2019). *Administration and Management of Education* ND: APH Publishing Corporation.
- Prasad, A (2007). *University education administration and the law*. New Delhi: Deep & Deep Publications.
- Punia,V (2004).*Managerial skills in educational administration* New Delhi: Deep & Deep Publications Pvt. Ltd.
- Rita, S (2004). Assessmem and accreditation in higher education. New Delhi Association of Indian Universities.
- Sayeed, O B. and Pareek, U. (2000). *Actualizing managerial roles*. New Delhi: Tata McGraw-Hill Publishing Company Limited.
- Sharma, R. A (2009). *Educational administration & management*. Meerut: R Lal Book Depot.
- Sindhu, I.S. (2012).*Educational administration & management*. New Delhi Pearson Publications
- Srivastav, A.K. (2009). *Educational administration policy, planning and survey*. New Delhi: Kunal Books
- Venkatesh (2018). Managerial Communication. ND APH Publishing Corporation

| Year | II | COURSE CODE: SOE010444GEC3014<br>INTRODUCTION TO COUNSELLING | Credit | 4 |
|---|---|---|---|---|
| Semester | IV | | Marks | 100 (Theory: 70, Internal: 30) |

**Objectives**

**On the completion of this course the students will be able**

- to understanding of Historical and Professional Foundations of Counselling in India
- to analyze their attitudes and beliefs about helping through self-assessment assignments
- to understand the roles, functions, and characteristics of counselors
- to counseling theories that provide the student with models to conceptualize client presentation and that help the student select appropriate counseling intervention

| Teaching Scheme (session)* | | | | Total (L+T+P) | Examination Scheme | | |
|---|---|---|---|---|---|---|---|
| Unit | Lecture (L) | Tutorial (T) | Practicum (P) | | Internal Assessment | External Assessment | Total Marks |
| I | 12 | 4 | 0 | 16 | 30 | 70 | 100 |
| II | 12 | 2 | 1 | 15 | | | |
| III | 12 | 3 | 2 | 17 | | | |
| IV | 12 | 3 | 1 | 16 | | | |
| Total | 48 | 12 | 04 | 64 | 30 | 70 | 100 |

**Course Content / Syllabus**

**Unit -1** — **Historical and Professional Foundations of Counselling**

- Counselling in India: History and Trends
- Personal and Professional Aspects of Counselling
- Ethical and Legal Aspects of Counselling
- Cultural Aspects of Counselling

**Unit -2** — **The Counselling Process and Assessment Interview**

- Building Counselling Relationships
- Testing, Assessment, and the Diagnosis in Counselling
- Working in a Counselling Relationship
- Termination of Counselling Relationships

| | |
|---|---|
| **Unit -3** | **Theories of Counselling** |
| | • Psychoanalytic and Psychodynamic Theories of Counselling<br>• Behavioural and Cognitive Theories of Counselling<br>• Humanistic Theories of Counselling |
| **Unit -4** | **Specialties in the Practice of Counselling** |
| | • Groups in Counselling<br>• Career Counselling Over the Life Span<br>• Marriage, Couple, and Family Counselling<br>• Counselling Children, Adolescents, and Young Adults |
| **Transactional Strategies** | Lectures - Session videos analysis- Case studies |

**Internal Assessment Strategies :**

**A total of thirty marks have been allotted under Internal Assessment. The nature of the activity, mode and weightage of marks are as follows.**

| S. No. | Activity | Mode | Weightage of Marks |
|---|---|---|---|
| 1 | Two Sessional tests will be conducted (Better one will be considered) | Test | 10 |
| 2 | Preparation of an assignment on various topics and it is followed by presentation in the classroom (Group activity) & Practicum | Assignment & Presentation (PPT) | 05+10 |
| 3 | Percentage of attendance | | 05 |
| **Total Marks** | | | **30** |

**Practicum :**

Draw a plan for the assessment of ability, aptitude, interest or personality of students. Explore two tests

- One each for the assessment of intelligence and aptitude at the elementary and secondary stage through different sources and prepare critical write-ups.
- Prepare a script of a session with a client student communicating either low ability or high ability scores highlighting the skills used by you in the session.
- Prepare a sociometric test. Administer the test on a group of students. Draw a sociogram and describe in details the group climate.

**Suggested Readings:**


- Brandes, B. (2016). *Introduction to counselling (2nd ed)*. Toronto, ON: Athabasca University/Pearson Education Canada.
- Burnard, P. (2005).*Counselling skills training*. New Delhi: Viva Book Private Limited.
- Chandra, R.(2009). *Career information and guidance and counselling*.Delhi:Isha Books.
- Chauhan, S.S. (2007). *Principle and techniques of guidance*. New Delhi: Vikas Publishing House.

- Chandanpat (2018). *Guidance and counselling*. ND: Educational Publisher & Distributor.
- Gibson. R. L. & Mitchell. M. (2016). *Introduction counselling and guidance*. New Delhi: PHI Learning Pvt. Ltd.
- Gibson. Robert L. & Mitchell, Marianne. H. (2008). *Introduction to counselling and guidance*. New Delhi: Pearson Prentice Hall in India.
- Gladding. R. (2018). Introduction to counselling. ND: Pearson.
- Gupta. M. (2005). *Effective guidance & counselling*. Jaipur: Mangal deep publications.
- Kochhar. S.K. (2009). *Guidance & counselling in colleges & universities*. New Delhi: Sterling Publishers Pvt Ltd.
- Mathur, S. S. (2008). *Fundamentals of guidance & counselling*. Agra: Aggarwal Publication.
- Mishra, R.C. (2004). *Guidance & counselling*. New Delhi: APH Publishing Corporation.
- Naik. D. (2007). *Fundamentals of guidance and counselling*. New Delhi: Adhyayan publishers
- Rao, S N. (2006). *Counselling and guidance*. Delhi: McGraw hill Publication.
- Rao, S. N. & Hari, H. S. (2004).*Guidance and counselling*. New Delhi: Discovery Pub. House.

| Year | II | COURSE CODE: SOEU0445GEC3014<br>INCLUSIVE EDUCATION | Credit | 4 |
|---|---|---|---|---|
| Semester | IV | | Marks | 100 (Theory: 70, Internal: 30) |

**Objectives**

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

- Understand concept, meaning and significance of inclusive education
- appreciate the need for promoting inclusive practice and the roles and responsibilities of the teachers
- develop critical understanding of the recommendations of various commissions and committees towards teacher preparation for inclusive education,
- understand the nature of difficulties encountered by children
- analyze special education, integrated education, mainstream and inclusive education practices.
- identify and utilize existing resources for promoting inclusive practice.

| Teaching Scheme (session)* | | | | Total (L+T+P) | Examination Scheme | | |
|---|---|---|---|---|---|---|---|
| Unit | Lecture (L) | Tutorial (T) | Practicum (P) | | Internal Assessment | External Assessment | Total Marks |
| I | 12 | 4 | 0 | 16 | 30 | 70 | 100 |
| II | 12 | 2 | 1 | 15 | | | |
| III | 12 | 3 | 2 | 17 | | | |
| IV | 12 | 3 | 1 | 16 | | | |
| **Total** | **48** | **12** | **04** | **64** | **30** | **70** | **100** |

**Course Content / Syllabus**

**Unit -I** — **Conceptual understanding of inclusive education**

- Definition, concept and importance of inclusive education.
- Historical perspectives of inclusive education for children with diverse needs.
- Difference between special education, integrated education and inclusive education.
- Advantages of inclusive education for education for all children in the context of right to education.

**Unit -2** — **National Initiatives**

- Recommendations of the Indian Education Commission (1964-66)

| | |
|---|---|
| | • Scheme of Integrated Education for Disabled Children<br>• National Policy on Education (NPE, 1986-92).<br>• The Persons with Disabilities Act (PWD Act, 1995).<br>• National Curriculum Framework, 2005 NCERT<br>• The Convention on the Rights of the Child (Article 23, 28, 29 a2, 3, 6 and 10& 12)<br>• The Mental Health Act 1987.<br>• Rehabilitation Council of India Act, 1992<br>• The National Trust for the Welfare of Persons with autism, cerebral palsy, mental retardation and Multiple Disabilities Act 1999. |
| **Unit -3** | **International Initiatives** |
| | • The World Declaration on the Survival, Protection and Development of Children and the Plans of action (Outcome of the UNICEF World Summit for Children, (1990)<br>• The World Conference on Special needs Education and the Salamanca, 1994 Statement and framework for action on Special Needs Education |
| **Unit -4** | **Current Issues in Inclusive Education** |
| | • Inclusion of all children with diverse needs in existing schools<br>• Early identifications and placement in inclusion,<br>• Development of plus curriculum<br>• Coordination and utility of resources<br>• N.C.F and adaptation of teaching learning material<br>• Research priority in inclusive education |
| **Transactional Strategies** | Lectures - Session videos analysis- Case studies |

**Internal Assessment Strategies :**

A total of thirty marks have been allotted under Internal Assessment. The nature of the activity, mode and weightage of marks are as follows.

| S. No. | Activity | Mode | Weightage of Marks |
|---|---|---|---|
| 1 | Two Sessional tests will be conducted (Better one will be considered) | Test | 10 |
| 2 | Preparation of an assignment on various topics and it is followed by presentation in the classroom (Group activity) & Practicum | Assignment & Presentation (PPT) | 05+10 |
| 3 | Percentage of attendance | | 05 |
| **Total Marks** | | | **30** |

**Practicum :**

Draw a plan for the assessment of ability, aptitude, interest or personality of students. Explore two tests

- One each for the assessment of intelligence and aptitude at the elementary and secondary stage through different sources and prepare critical write-ups.
- Prepare a script of a session with a client student communicating either low ability or high ability scores highlighting the skills used by you in the session.
- Prepare a socio-metric test. Administer the test on a group of students. Draw a socio-gram and describe in details the group climate

**Suggested Readings:**


- Barton, L. and Armstrong, F. (2007) *Policy experience and change: Reflections on inclusive education.* Dordrecht: Springer
- Billings, G.L. (2006). It is not the culture of poverty, it is Poverty of Culture: The problem with Teacher Education. *Anthropology and Education Quarterly, 37 (2),* 104-109.
- Boscardin, M L. (2005). The Administrative Role in Transforming Secondary Schools to Support Inclusive Evidence-Based Practices. *American Secondary Education, 33(3),* 21-32.
- Dovidio, J.F., Hewstone M., Glick, P & Esses, V.M. (2010).*Handbook of prejudice, stereotyping and discrimination.* India. Sage Publication.
- Ellsworth, E (1989). Why Doesn't This Feel Empowering? Working Through the Repressive Myths of Critical Pedagogy. *Harvard Educational Review, 59 (3),* 297-325.
- Fendler, L. & Muzaffar, I. (2008). The history of bell curve. Sorting and the idea of normal *Educational Theory,* 58(1), 63-82.
- Florian, L. & Black-Hawkins, K. (2011). Exploring inclusive pedagogy. *British Educational Research Journal,* 37(5), 813-828.
- George J., Dei, S. (2001). Rescuing theory Anti-racism and inclusive education. *Race Gender & Class in Education* 2-8(1), 139-161.
- Hammersley, M. (2007).*Educational research and evidence-based practices.* UK: Sage Publications.
- Harpell, J. V. and Andrews J. (2010). Administrative leadership in the age of inclusion: Promoting best practices and teacher empowerment. *The Journal of Educational Thought (JET), 44(2),* 189-210.
- Holsinger D.H. & Jacob W.J (2008) *Inequalities in education.* China: Springer
- Kugelmass, J.W. (2006). Sustaining cultures of inclusion. The value and limitation of cultural analyses. *European Journal of Psychology of Education,* 21(3).
- Nayak. (2018). *Inclusive school.* ND. APH Publishing Corporation.
- Narain, S. (2011). Pedagogic voicing: The struggle for participation in an Inclusive set-up *Anthropology & Education Quarterly,* 42 (3), 245-262.
- Premchander, S., Sudan, K. & Peter Reid, P. (2009) *Finding Pathways Social Inclusion in rural development* Bangalore Books for change.
- Rowman, M L. (2005) *Capitalists and conquerors: A critical pedagogy against empire* USA: Littlefield Publisher.
- Rekha (2018). *Inclusive education.* ND. APH Publishing Corporation.
- Sleeter, C. E. and McLaren, P. L. (1995). *Multicultural education, critical pedagogy, and the politics of difference* New York: State University Press
- Smith, J P. (2000) *Policy response to Social exclusion: Towards inclusion* USA: Open University Press
- UNESCO (2003) *Overcoming exclusion through inclusive approaches in education* A challenge and a Vision. UNESCO.

**Annexure-VII**

**Central University of Haryana**
**School of Physical and Mathematical Sciences**

**Minutes of School Board Meeting held on 14.02.2019**

A meeting of the School Board of the School of Physical and Mathematical Sciences (SPMS) was held on 14.02.2019 at 10:00am in the office of Dean, SPMS.

**Following agenda items were discussed and resolved accordingly:**

1. Starting of Ph.D. programmes in the Departments of Physics and Mathematics.
2. Modify/update scheme and syllabi of courses for M.Sc. Mathematics programme.
3. Scheme and Syllabi of PhD course work for Physics Department
4. Scheme and Syllabi of PhD course work for Mathematics Department

**1. Starting of Ph.D. programmes in the Departments of Physics and Mathematics:** It was resolved and recommended to start the Ph.D. programmes in the Departments of Physics and Mathematics w.e.f. academic session 2019-20, as regular faculty members have now joined in both the departments.

**2. Modify/update scheme and syllabi of courses for M.Sc. Mathematics programme:** Proposal of revised scheme & syllabi for M.Sc. Mathematics as recommended by BOS (Mathematics) was discussed. The same was approved and recommended to be made effective from session 2019-20 (starting July 2019).

**3. Scheme and Syllabi of PhD course work for Physics Department**

Scheme and Syllabi of PhD course work for Physics Department were discussed and approved. Further, these were recommended to be made effective from session 2019-20 (starting July 2019).

**4. Scheme and Syllabi of PhD course work for Mathematics Department**

Scheme and Syllabi of PhD course work for Mathematics Department as approved by BOS (Mathematics), were also discussed, approved and recommended to be made effective from session 2019-20 (starting July 2019).

Following members were present in the meeting:

1. Prof. Nawal Kishore, Dean, SPMS, Chairman
2. Dr. Rajesh Kumar Gupta, (Head, Department of Mathematics, SPMS, CUH)
3. Dr. Suneel Kumar, (Associate Professor, Department of Physics, SPMS, CUH)
4. Dr. Sharanjeet Dhawan (Assistant Professor, Department of Mathematics, SPMS, CUH)
5. Dr. Jaswant Kumar, (Assistant Professor, Department of Physics, SPMS, CUH)
6. Dr..Kapil Kumar, (Assistant Professor, Department of Statistics, SPMS, CUH)
7. Dr. P.K. Taygi, (Associate Professor, Department of Physics, SPMS, CUH), Special Invitee

Prof. Nawal Kishore | Dr. Rajesh Kumar Gupta | Dr. Suneel Kumar | Dr. P.K. Taygi

Dr. Sharanjeet Dhawan | Dr. Jaswant Kumar | Dr. Kapil Kumar

**Central University of Haryana**
**Department of Mathematics**

**Minutes of BOS Meeting held on 17.12.2018**

A meeting of the Board of Studies (BOS) of the Department of Mathematics was held on 17.12.2018 at 11:00 AM in the Department of Mathematics, Central University of Haryana, Mahendergarh and the following members were present:

1. Dr. Rajesh Kumar Gupta, (Head, Department of Mathematics, CUH).
2. Prof. Kuldeep Bansal (GJUST, Hisar, Haryana), External Expert.
3. Dr. Arun Kajla (Department of Mathematics, CUH), Internal Member.
4. Dr. Phool Singh (Department of Mathematics, SOET, CUH), Special Invitee.

Prof. B. K. Dass (University of Delhi), External Expert could not attend the meeting.

**Following agenda items were considered and resolved accordingly:**

1. Approval of proposal to start Ph.D. programme.
2. Formulation of Departmental Research Committee (DRC).
3. Modify/update syllabi of some courses and to introduce some new courses for M.Sc. Mathematics programme.
4. Panel of paper setters and examiners for M.Sc. courses.
5. Permission to Ms. Sangeeta, student of M.Sc. Mathematics for one year break.

1. **Approval of proposal to start Ph.D. programme:** The Board recommended to start PhD programme w.e.f. academic session 2019-20 in Department of Mathematics in view of availability of eligible faculty members to supervise PhD students. The Board also recommended the Scheme and Syllabi for course work of Ph.D Mathematics as per Ph.D. ordinance.

2. **Formulation of Departmental Research Committee (DRC):** The Board prepared a panel of external experts for Departmental Research Committee (DRC).

3. **Modify/update syllabi of some courses and to introduce some new courses for M.Sc. Mathematics programme:** The Board recommended the revised Scheme & Syllabi for M.Sc. Mathematics w.e.f. 2019-20. The updated syllabi may be forwarded to academic branch for further approval.

4. **Panel of paper setters and examiners for M.Sc. courses**

The Board recommended the Panel of Paper-Setters/Examiners for M.Sc. (Mathematics, CBCS) 2nd & 4th Semesters(Regular & Reappear) for May-June, 2019 examinations. Further, the Board also recommended that the Paper-Setting for M.Sc. (Mathematics, CBCS) 1st and 3rd Semesters for reappear students, if any, for May-June, 2019 examinations may be done from the panel already supplied for December, 2018 examinations. The approved panels are being sent to COE/AR(Exam) under sealed cover. Further, HOD, Dept. of Mathematics is authorized to supply additional names, if required.

5. **Permission to Ms. Sangeeta, student of M.Sc. Mathematics to join M.Sc. after one year break:**

Ms. Sangeeta, was not able to continue her studies of M. Sc. Mathematics in second year 2018-19 due to maternity leave and illness. The Board recommended her admission in M. Sc. Mathematics second year during 2019-20 session if she is eligible as per University rules.

The meeting ended with a vote of thanks to the chair.

17/12/18

Prof. Kuldeep Bansal

17/12/18

Dr. Rajesh Kumar Gupta

Dr. Arun Kajla

17/12/18

Dr. Phool Shingh

# DEPARTMENT OF MATHEMATICS

Scheme & Syllabi

Ph.D. course work in Mathematics




**W.E.F. 2019-20**

**CENTRAL UNIVERSITY OF HARYANA**
**JANT-PALI, MAHENDERGARH**
**HARYANA-123031**
www.cuh.ac.in

# Department of Mathematics

## Central University of Haryana
**Mahendergarh, Haryana-123031**

Scheme and Syllabus of Ph.D. Mathematics
(CHOICE BASED CREDIT SYSTEM)

**Course Type**

Core Course (C)
Discipline Centric Elective Course (E) of subject specific.

**Total Credit: 12**

Each candidate is required to take core course and one elective course of subject specific.

| S. No. | Course Title | Course Code | Credits | Course Type |
|---|---|---|---|---|
| 1. | SPMS MAT 02 01 01 C 6006 | Research Methodology | 6 | Core |
| 2. | SPMS MAT 02 01 01 E 5106 | Symmetries and Differential Equations | 6 | Elective |
| 3. | SPMS MAT 02 01 02 E 5106 | Lie Groups and Lie Algebra | 6 | Elective |
| 4. | SPMS MAT 02 01 03 E 5106 | Fractional Calculus and Fractional Differential Equations | 6 | Elective |
| 5. | SPMS MAT 02 01 04 E 5106 | Finite Element Analysis | 6 | Elective |
| 6. | SPMS MAT 02 01 05 E 5106 | Mathematical Foundation of Image Processing | 6 | Elective |
| 7. | SPMS MAT 02 01 06 E 5106 | Approximation Theory | 6 | Elective |
| 8. | SPMS MAT 02 01 07 E 5106 | Complex Dynamics | 6 | Elective |
| 9. | SPMS MAT 02 01 08 E 5106 | Dynamical Systems | 6 | Elective |
| 10. | SPMS MAT 02 01 09 E 5106 | Computational Neuroscience | 6 | Elective |
| 11. | SPMS MAT 02 01 10 E 5106 | Algebraic Topology | 6 | Elective |

| S. No. | Course Title | Course Code | Credits | Course Type |
|---|---|---|---|---|
| 12. | SPMS MAT 02 01 11 E 5106 | Knot Theory | 6 | Elective |

# Research Methodology

(SPMS MAT 02 01 01 C 6006)

End Semester Examination: 60
Internal Assessment: 40
Total: 100

## UNIT I

**Research Problems:** Meaning, Motivation, Objectives and types of research, Significance of research, Research proposals and aspects, Criteria of good research, Research formulation and hypotheses, Selection and necessity of defining the problem, Literature review, Primary and secondary sources, Reviews, Treatise, Monographs, Patents.

## UNIT II

**Research Design:** Need, Problem Definition, Variables, Research design concepts, Research design process, Research Modeling: Types of models, Model building and stages, Data collection, processing and analysis, Simulation techniques using computer software(s).

## UNIT III

**Design and Planning of Experiments:** Aims and objectives, expected outcome, methodology to be adopted, importance of reproducibility of research work, Interpolation, Extrapolation, Types of errors (rounding, truncation, machine and random), Error analysis and least square curve fitting. Analysis of Variance components (ANOVA) for fixed effect model, Objectives and basic principles of designs of experiments. Complete randomized design (CRD), Randomized block design (RBD) and Latin square design (LSD).

## UNIT IV

**Data mining and Report Writing:** Library resources, Internet, Scientific search engines, Introduction to Latex/Google docs, Structure and component of research paper, Presenting the research paper/thesis, Journal impact factor, Citation index, References and bibliography, Copyright, Plagiarism and ethics in research, Communication and presentation.

**Suggested Readings:**


1. Kothari, C.R & Garg, G. (2014). Research Methodology: Methods and Techniques, 3rdEdition. New Age International Publishers, New Delhi.
2. Pannerselvan, R. (2009). Research Methodology. Prentice Hall of India, New Delhi.
3. Singh, Y.K. (2008). Fundamental of Research Methodology and Statistics. New Age International Publishers, New Delhi.
4. Montgomery, D.C. (2013). Design and Analysis of Experiments, 8th Edition. Wiley India.
5. Prathapan, K. (2014). Research Methodology for Scientific Research. IK International, New Delhi.

## Symmetries and Differential Equations

(SPMS MAT 02 01 01 E 5106)

End Semester Examination: 60
Internal Assessment: 40
Total: 100

### UNIT I

Dimensional Analysis: Buckingham Pi-theorem, Assumptions behind dimensional analysis, Conclusions from dimensional analysis, Proof of the Buckingham Pi-theorem and examples, Application of dimensional analysis to partial differential equations, Generalization of dimensional analysis, Invariance of partial differential equations under scaling of variables.

### UNIT II

Lie Group of Transformations: Groups, Examples of groups, Groups of transformations, One-parameter Lie group of transformations, Examples of one-parameter Lie groups of transformations, Infinitesimal transformations: First fundamental theorem of Lie, Infinitesimal generators.

### UNIT III

Invariant functions, Canonical coordinates, Lie bracket, Lie series, Extended transformations: Extended group transformations-one dependent and one independent variable, Extended infinitesimal transformations-one dependent and one independent variable, Extended transformations- one dependent and n independent variables.

### UNIT IV

Group theoretic techniques, Lie Classical method, Symmetry reduction method, Non classical method, Reduction of PDEs to Ordinary differential equations (ODEs), Exact solutions of PDEs.

**Suggested Readings:**


1. Bluman G. W. and Anco A. C., *Symmetry and Integration Methods for Differential Equations*, Appl. Math. Sci., 154, Springer, New York, 2002.
2. Bluman G. W. and Kumei S., *Symmetries and Differential Equations*, Appl. Math.Sci., Springer-Berlin, 1989.
3. Olver P. J., *Applications of Lie Groups to Differential Equations*, Springer-Verlag, New York 1993. 4. L. V. Ovsiannikov, *Group Properties of Differential Equations*, Novosibirsk, Moscow, 1962.

## Lie Groups and Lie Algebra
(SPMS MAT 02 01 02 E 5106)

End Semester Examination: 60
Internal Assessment: 40
Total: 100

### UNIT I

Differential Manifolds, Topological manifolds, Charts, Atlases and smooth structure, Smooth maps and diffeomorphism, Partitions of Unity, Tangent space, Tangent map, Vector fields and 1-forms.

### UNIT II

Lie Groups Definition and examples, Linear Lie groups, Lie group homomorphism, Multi-parameter Lie groups of transformations; Lie algebra and the exponential map, Adjoint representation.

### UNIT III

Lie algebras, r-parameter Lie groups of transformations, Classical Lie algebras, Solvable and nilpotent Lie algebras, Lie and Engel theorems.

### UNIT IV

Semi-simple and reductive algebras, Semi-simplicity of classical Lie algebras, Killing form; Jordan decomposition; Engel's Theorem, Cartan subalgebra and Root space decomposition.

**Suggested Readings:**


1. J. E. Humphreys, Introduction to Lie Algebras and Representation Theory, Graduate Text in Mathematics, 9, Springer-Verlag, 1980.
2. N. Jacobson, Lie Algebras, Wiley-Interscience, New York, 1962.
3. J. P. Serre, Lie Algebras and Lie Groups, Benjamin, New York, 1965.
4. N. Bourbaki, Lie Groups and Lie Algebras, Springer Science & Business Media, 1998.
5. K. J. Alexander, An Introduction to Lie Groups and Lie Algebras, Cambridge University Press. 6. S. Kumaresan, Differential Geometry and Lie Groups, Hindustan Book Agency.
7. B. Hall, Lie Groups, Lie Lagebras, and Representations: An Elementary Introduction, Second Edition, Springer.
8. P. J. Olver, Application of Lie Groups to Differential Equations, Second Edition, Springer.

## Fractional Calculus and Fractional Differential Equations

(SPMS MAT 02 01 03 E 5106)

End Semester Examination: 60
Internal Assessment: 40
Total: 100

### UNIT I

Gamma function and its properties, Beta function, Contour integral representation. Fractional derivatives: Grunwald-Letnikov, Riemann-Liouville and Caputo's fractional derivative, Leibniz rule for fractional derivatives, Geometric and physical interpretation of fractional integration and fractional differentiation.

### UNIT II

Sequential fractional derivatives. Left and right fractional derivatives. Properties of fractional derivatives. Laplace transforms of fractional derivatives. Fourier transforms and Mellin transforms of fractional derivatives.

### UNIT III

Linear Fractional Differential Equations: Fractional differential equation of a general form. Existence and uniqueness theorem as a method of solution. Dependence of a solution on initial conditions. The Laplace transform method. Standard fractional differential equations. Sequential fractional differential equations.

### UNIT IV

Fractional Differential Equations: Introduction, Linearly independent solutions, Solutions of the homogeneous and non-homogeneous fractional differential equations, Reduction of fractional partial differential equations to ordinary differential equations.

**Suggested Readings:**

1. Oldham K. B. & Spanier J., The Fractional Calculus: Theory and Applications of Differentiation and Integration to Arbitrary Order, Dover Publications Inc, 2006.
2. Miller K. S. & Ross. B., An Introduction to the Fractional Calculus and Fractional Differential Equations Hardcover, Wiley Blackwell, 1993.
3. Podlubny I., Fractional Differential Equations, Academic Press, 1998.

## Finite Element Analysis

(SPMS MAT 02 01 04 E 5106)

End Semester Examination: 60
Internal Assessment: 40
Total: 100

**UNIT I**

Introduction to Finite Element Methods. Difference between Finite Element and Finite Difference Methods, Method of Weighted Residuals: Collocation, Method of Least squares, Galerkin's method, Review of Calculus of Variations, Ritz Method.

**UNIT II**

Linear, quadratic and higher order elements, Difference between 1D and 2D approach, types of 2D elements, Local coordinates, Global coordinates, Assembly. Triangular elements: linear and quadratic elements with area coordinates, General Quadrilateral elements, linear and higher order.

**UNIT III**

Numerical integration, Construction of shape functions: Linear elements (One dimensional bar element, two dimensional-Triangular and rectangular elements, three dimensional tetrahedron element). Assembly of element equations and their solution, Application to flow and heat transfer problems, Discussion over higher order differential equations.

**UNIT IV**

Application of finite element methods for solving various boundary value problems, Computer procedures for Finite element analysis.

***Suggested Readings:***

1 . Zienkiewicz, O. C. and Taylor, R. L. *The Finite Element Method: The Basis*. Butterworth-Heinemann, 2000.

2. Smith, G. D. *Numerical solution of Partial Differential Equations: Finite difference methods*. Oxford Applied Mathematics and Computing Science Series, 1985.

3. Hughes, T. J. R. *The Finite Element Method (Linear Static and Dynamic Finite Element Analysis)*. Courier Corporation, 2007.

## Mathematical Foundation of Image Processing

(SPMS MAT 02 01 05 E 5106)

End Semester Examination: 60
Internal Assessment: 40
Total: 100

### UNIT I

**Image:** The origins of digital image processing, classification of images, examples of fields that use digital image processing, elements of digital image processing systems, image sampling and quantization, some basic relationships like neighbours, connectivity, distance measures between pixels translation, scaling, rotation and perspective projection of image, reading, displaying, writing images using software. data classes, image types using software based simulation.

### UNIT II

**Operations on Images:** Converting between data classes and image types, some basic gray level transformations histogram processing, enhancement using arithmetic and logic operations combining spatial enhancement methods basics of spatial filters, smoothening and sharpening spatial filters intensity transformation function, histogram processing and function plotting using software.

### UNIT III

**Transforms on Images:** Introduction to Fourier transform and the frequency domain. Computing and visualizing image in frequency domain, Smoothing Frequency Domain Filters, Sharpening Frequency Domain Filters, Homomorphic Filtering. Mathematical decomposition on images. Wavelet transform on images.

### UNIT IV

**Image restoration:** A model of the image degradation / restoration process, noise models restoration in the presence of noise only spatial filtering, periodic noise reduction by frequency domain filtering linear position-invariant degradations estimation of degradation function, inverse filtering wiener filtering, geometric mean filter geometric transformations, image compression: coding interpixel and psychovisual redundancy image compression models compression standards, image segmentation: detection of discontinuities edge linking and boundary detection thresholding, object recognition: patterns and pattern classes decision-theoretic methods structural methods.

*Suggested Readings:*


1. Jain A. K., *Fundamentals of Digital Image Processing*, 1 edition. Englewood Cliffs, NJ: Pearson, 1988.
2. Lim J. S., *Two-Dimensional Signal and Image Processing*, 1 edition. Englewood Cliffs, N.J: Prentice Hall PTR, 1989.
3. Gonzalez R. C., Woods R. E., and Eddins S. L., *Digital Image Processing Using Matlab*, 1st edition. New Delhi: Dorling Kindersley Pvt Ltd, 2006.
4. Gonzalez, *Digital Image Processing*, 4th ed. Upper Saddle River, N.J.: Pearson, 2018.
5. Gong S., Liu C., Ji Y., Zhong B., Li Y., and Dong H., *Advanced Image and Video Processing Using MATLAB*. Springer International Publishing, 2019.

# Approximation Theory

(SPMS MAT 02 01 06 E 5106)

End Semester Examination: 60
Internal Assessment: 40
Total: 100

**UNIT-I**

Concept of best approximation in a normed linear space, Existence of the best approximation, Uniqueness problem, Convexity-uniform convexity, strict convexity and their relations, Continuity of the best approximation operator.

**UNIT-II**

The Weierstrass theorem, Bernstein polynomials, Korovkin theorem, Algebraic and trigonometric polynomials of the best approximation, Lipschitz class, Modulus of continuity, Integral modulus of continuity and their properties.

**UNIT-III**

Bernstein's inequality, Jackson's theorems and their converse theorems, Approximation by means of Fourier series.

**UNIT-IV**

Positive linear operators, Monotone operators, Simultaneous approximation, $L^p$ -approximation, Approximation of analytic functions.

**Suggested Books:**


1. Cheney, E. W., "Introduction to Approximation Theory", AMS Chelsea Publishing Co. 1981.
2. Lorentz, G. G., "Bernstein Polynomials", Chelsea Publishing Co. 1986
3. Natanson, I. P., "Constructive Function Theory Volume-I", Fredrick Ungar Publishing Co 1964.
4. Mhaskar, H. M. and Pai, D. V., "Fundamentals of Approximation Theory" Narosa Publishing House 2000
5. Timan, A. F., "Theory of Approximation of Functions of a Real Variable," Dover Publication Inc 1994.
6. Gupta V. and Agarwal, R. P., Convergence Estimates in Approximation Theory, Springer, 2014.

## Complex Dynamics

(SPMS MAT 02 01 07 E 5106)

End Semester Examination: 60
Internal Assessment: 40
Total: 100

### UNIT-I

Iteration of a Mobius transformation, attracting, repelling and indifferent fixed points. Iterations of $R(z) = z^2$, $z^2+c$, $z + 1/z$. The extended complex plane, chordal metric, spherical metric, rational maps, Lipschitz condition, fixed points, Critical points, Riemann Hurwitz relation.

### UNIT-II

Equicontinuous functions, normal sets, Fatou sets and Julia sets, completely invariant sets, Normal families and equicontinuity, Properties of Julia sets, exceptional points backward orbit, minimal property of Julia sets.

### UNIT-III

Julia sets of commuting rational functions, structure of Fatou set, Completely invariant components of the Fatou set, The Euler characteristic, Riemann Hurwitz formula for covering maps, maps between components of the Fatou sets, the number of components of Fatou sets, components of Julia sets.

### UNIT-IV

Origin of bifurcation, stability of fixed point, equilibrium point, Hopf bifurcation, Non linear oscillator, solution of non-linear differential equations, randomness of orbits of a dynamical system, chaos, strange attractors. Classical Fractals, Cantor set, Sierpinski triangle, Von Koch curve.

**Suggested references:**


1. An introduction to chaotic dynamical system by Robert L. Devaney, Addison Wesley publishing house Co inc. 1989.
2. Fractals Everywhere by M. F. Barnsley, 2nd edition, Academic Press, 1995
3. Nonlinear Dynamics and Chaos with Applications to Physics, Biology, Chemistry and Engineering, by Steven H. Strogatz, Westview Press.
4. A. F. Beardon, Iteration of rational functions, Springer Verlag , New York, 1991.
5. S. Morosawa, Y. Nishimura, M. Taniguchi, T. Ueda, Holomorphic dynamics, Cambridge University Press, 2000.

## Dynamical System

(SPMS MAT 02 01 08 E 5106)

End Semester Examination: 60
Internal Assessment: 40
Total: 100

**UNIT-I**

Linear Systems: Exponentials of operators, linear systems in **R2,** Complex eigenvalues, Multiple eigenvalues, Jordon forms, Stability theory, generalized eigenvectors and invariant subspaces, Non-homogeneous linear systems.

**UNIT-II**

Non-linear Systems: local analysis: the fundamental existence-uniqueness theorem, the flow defined by a differential equation, Linearization, Stability and Liapunov functions, Saddles, Nodes, Foci, and Centers. Global analysis: Dynamical systems and global existence theorem, Limit sets and Attractors, Periodic orbits, Limit Cycles, and Seperatrix cycles, the Poincare map, Poincare-Bendixon theory in R2.

**UNIT-III**

Origin of bifurcation, stability of fixed point, equilibrium point, Hopf bifurcation, Non linear oscillator, solution of non-linear differential equations, randomness of orbits of a dynamical system, chaos, strange attractors.

**UNIT-IV**

Iteration theory, Julia sets, Fatou sets, Mandelbrot set, Characterization of Julia sets, Dynamics of functions exp z , sin z and cos z, Classical Fractals, Cantor set, Sierpinski triangle, Von Koch curve.

**Suggested references:**


1. Differential Equations and Dynamical Systems by Lawrence Perko, Springer-Verlag, 2006.
2. Differential Equations, Dynamical Systems and an Introduction to Chaos by Morris W. Hirsch, Stephen Smale and Robert L. Devaney, Academic Press, 2013
3. Dynamical Systems and Numerical Analysis by A.M. Stuart and A.R. Humphries, Cambridge University Press, 1998.
4. Fractals Everywhere by M. F. Barnsley, 2nd edition, Academic Press, 1995
5. An introduction to chaotic dynamical system by Robert L. Devaney, Addison Wesley publishing house Co inc. 1989.
6. Nonlinear Dynamics and Chaos with Applications to Physics, Biology, Chemistry and Engineering, by Steven H. Strogatz, Westview Press.
7. A. F. Beardon, Iteration of rational functions, Springer Verlag , New York, 1991.
8. S. Morosawa, Y. Nishimura, M. Taniguchi, T. Ueda, Holomorphic dynamics, Cambridge University Press, 2000.

## Computational Neuroscience

(SPMS MAT 02 01 09 E 5106)

End Semester Examination: 60
Internal Assessment: 40
Total: 100

### UNIT I

**Dynamical System:** Preliminaries from linear algebra, Bases and subspaces, Planer linear systems and its classification, eigenvalues and eigenvector, solving linear systems, phase portraits for planer system, trace-determinant plane, dynamical classification.

### UNIT II

**Nonlinear systems:** Dynamic systems, the existence and uniqueness theorem, continuous dependence of solutions, the variational equation, Equilibria in non-linear systems and some illustrative examples, nonlinear sinks and sources, saddles, stability, bifurcation, nullclines, Software based simulation.

### UNIT III

**Neuron:** Elements of Neuronal systems, the ideal spiking neuron, spike trains, synapses, postsynaptic potentials, firing threshold and action potential, a phenomenological neuron model, The problem of neuronal coding, rate code as spike count, spike density, population activity, spike code as time-to-first-spike, phase, correlations and synchrony, stimulation reconstruction and revers correlation. Nernst potential, reversal Potential.

### UNIT IV

**Single Neuron Modeling:** Hodgkin-Huxley model, definition and dynamics and its software based simulation. Effect of various Ion channels, Sodium channel, potassium channel, low-threshold Calcium channel and its dynamics. Feedback: inhibitory and excitatory synapses. Two-dimensional Neuron models and their software based simulation.

**Suggested references:**


1. Gerstner W. and Kistler W. M., *Spiking Neuron Models: Single Neurons, Populations, Plasticity*, 1 edition. Cambridge University Press, 2002.
2. 2. Feng J., *Computational Neuroscience: A Comprehensive Approach*. CRC Press, 2003.
3. Dayan P., Sejnowski T. J., and Poggio T. A., *Theoretical Neuroscience – Computational and Mathematical Modeling of Neural Systems*, Revised ed. edition. Cambridge, Mass.: MIT Press, 2005.
4. Perko L., *Differential Equations and Dynamical Systems*, 3rd edition. New York: Springer, 2006.
5. Lynch S., *Dynamical Systems with Applications using Mathematica®*, 2007 edition. Boston, Mass: Birkhäuser, 2007.
6. Trappenberg T., *Fundamentals of Computational Neuroscience*, 2 edition. OUP Oxford, 2009.
7. Hirsch M. W., Smale S., and Devaney R. L., *Differential Equations, Dynamical Systems, and an Introduction to Chaos*, 3 edition. Waltham, MA: Academic Press, 2012.
8. Robertson K., Ed., *Computational Neuroscience*. Larsen and Keller Education, 2017.
9. Miller P., Sejnowski T. J., and Poggio T. A., *An Introductory Course in Computational Neuroscience*, 1 edition. Cambridge, Masachusetts: MIT Press, 2018.

## Algebraic Topology

(SPMS MAT 02 01 10 E 5106)

End Semester Examination: 60
Internal Assessment: 40
Total: 100

**UNIT-I**

Mainfolds: Indentification (quotient) spaces and identification (quotient) maps; topology n-manifolds including surfaces, Sn, RPn, CPn. and lens spaces. Triangulated manifolds: Representation of triangulated, closed 2-manifolds as connected sums of tori of projective planes.

**UNIT-II**

Fundamental group, functoriality, retract, deformation retract; Van Kampen's Theorem, classification of surfaces by abelianizing the fundamental group, covering spaces, path lifting, homotopy lifting, uniqueness of lifts, general lifting theorem for maps.

**UNIT-III**

Covering transformations, regular covers, correspondence between subgroups of the fundamental group and covering spaces, computing the fundamental group of the circle, RPn, lens spaces via covering spaces.

**UNIT-IV**

Simplicial homology: Homology groups, functoriality, topological invariance, Mayer-Vietoris sequence; applications, including Euler characteristic, classification of closed trangulated surfaces via gomology and via Euler characteristic and orientability; degree of a map between oriented manifolds, Lefschetz number, Brouwer Fixed Point Theorem.

***Suggested Readings:***


1. A Hatcher. Algebraic Topology, Cambridge University Press, 2002.
2. R C Kirby and L C Siebenmann. Foundational Essays on Topological Manifolds, Smoothings, and Triangulations. Annals of Math Studies 88. Princeton University Press, 1977.
3. J P May. A Concise Course in Algebraic Topology. University of Chicago Press, 1999.
4. G E Bredon. Topology and Geometry. Springer GTM 139, 1993.

## Knot Theory

(SPMS MAT 02 01 11 E 5106)

End Semester Examination: 60
Internal Assessment: 40
Total: 100

### UNIT-I

Knots, diagram of a knot, Composition of knots, Reidemeister moves, links, Invariants of knots, rational tangles, 2-bridge knots.

### UNIT - II

Surfaces and Knots: Genus and Seifert surfaces, Torus knots, knots and its properties, Setelite Knots, Hyperbolic Knots.

### UNIT – III

Braids, Braids groups, Morkov moves, Alexander's theorem, Representation of torus knots, Alternating knots, Quasi alternating knots.

### UNIT-IV

Alexander polynomial, Bracket polynomial, HOMFLY polynomial, Jones polynomial, Vassiliev Invariants, Knot complements and 3-Manifolds.

***Suggested Readings:***


1. C C Adams. The Knot Book. W.H. Freeman, 1994
2. C Livingston. Knot Theory. Carus Mathematical Monographs 24. Mathematical Association of America, 1993.
3. J Roberts. Knots Knotes. http://math.ucsd.edu/~justin/papers/knotes.pdf
4. D Rolfsen. Knots and Links. Publish or Perish, 1976.
5. G Burde and H Zieschang. Knots. 2nd ed. de Gruyter, 2003.
6. A Kawauchi. Survey of Knot Theory. Birkhauser, 1996.
7. W B R Lickorish. An Introduction to Knot Theory. Springer GTM 175, 1997.

# DEPARTMENT OF MATHEMATICS

## Scheme & Syllabus
## M.Sc. (Mathematics)

**W.E.F. 2019-20**

**CENTRAL UNIVERSITY OF HARYANA**
**JANT-PALI, MAHENDERGARH**
**HARYANA-123031**
www.cuh.ac.in

# Department of Mathematics

## Central University of Haryana
## Mahendergarh, Haryana-123031

Scheme and Syllabus of M.Sc. Mathematics
(CHOICE BASED CREDIT SYSTEM)

**Course Type**

Core Course (C)
Generic Elective Course (GEC)
Discipline Centric Elective Course (DCEC)
Skill Enhancement Elective Course (SEEC)

**Total Credit: 96, Semester-wise distribution of credits: 24+ 24 + 24 + 24**

**CORE COURSE (C)**

| S. No. | Course code | Course title | L | T | P | C |
|---|---|---|---|---|---|---|
| 1. | SPMMAT 01 01 01 C 3104 | Real Analysis | 3 | 1 | 0 | 4 |
| 2. | SPMMAT 01 01 02 C 3104 | Algebra-I | 3 | 1 | 0 | 4 |
| 3. | SPMMAT 01 01 03 C 3104 | Complex Analysis | 3 | 1 | 0 | 4 |
| 4. | SPMMAT 01 01 04 C 3104 | Differential Equations | 3 | 1 | 0 | 4 |
| 5. | SPMMAT 01 01 05 C 2023 | Programming in C | 3 | 0 | 2 | 4 |
| 6. | SPMMAT 01 02 01 C 3104 | Linear Algebra | 3 | 1 | 0 | 4 |
| 7. | SPMMAT 01 02 02 C 3104 | Topology | 3 | 1 | 0 | 4 |
| 8. | SPMMAT 01 02 03 C 3125 | Numerical Analysis | 3 | 1 | 2 | 5 |
| 9. | SPMMAT 01 02 04 C 2023 | Typesetting in Latex | 2 | 0 | 2 | 3 |
| 10. | SPMMAT 01 03 01 C 3104 | Integral Equations and Calculus of Variation | 3 | 1 | 0 | 4 |
| 11. | SPMMAT 01 03 02 C 3104 | Mechanics | 3 | 1 | 0 | 4 |
| 12. | SPMMAT 01 03 03 C 3104 | Mathematical Statistics | 3 | 1 | 0 | 4 |
| 13. | SPMMAT 01 03 04 C 0084 | Seminar | 0 | 0 | 8 | 4 |

## DISCIPLINE CENTRIC ELECTIVE COURSES (DCEC)

**(Offered to the students of M.Sc. Mathematics by the Department)**

| S. No. | Course code | Course title | L | T | P | Credit |
|---|---|---|---|---|---|---|
| 1. | SPMMAT 01 02 01 DCEC 3104 | Wavelet Analysis | 3 | 1 | 0 | 4 |
| 2. | SPMMAT 01 02 02 DCEC 2124 | Object Oriented Programming with C++ | 2 | 1 | 2 | 4 |
| 3. | SPMMAT 01 02 03 DCEC 3104 | Information Theory | 3 | 1 | 0 | 4 |
| 4. | SPMMAT 01 02 04 DCEC 3104 | Number Theory | 3 | 1 | 0 | 4 |
| 5. | SPMMAT 01 02 05 DCEC 3104 | Operations Research | 3 | 1 | 0 | 4 |
| 6. | SPMMAT 01 03 01 DCEC 3104 | Applied Discrete Mathematics | 3 | 1 | 0 | 4 |
| 7. | SPMMAT 01 03 02 DCEC 3104 | Finite Element Methods | 3 | 1 | 0 | 4 |
| 8. | SPMMAT 01 03 03 DCEC 3104 | Algebra - II | 3 | 1 | 0 | 4 |
| 9. | SPMMAT 01 03 04 DCEC 3104 | Fluid Dynamics | 3 | 1 | 0 | 4 |
| 10. | SPMMAT 01 03 05 DCEC 3104 | Fuzzy Set Theory | 3 | 1 | 0 | 4 |
| 11. | SPMMAT 01 03 09 DCEC 2124 | Programming in MATLAB | 2 | 1 | 2 | 4 |
| 12. | SPMMAT 01 04 01 DCEC 3104 | Differential Geometry | 3 | 1 | 0 | 4 |
| 13. | SPMMAT 01 04 02 DCEC 3104 | Mathematical Modelling | 3 | 1 | 0 | 4 |
| 14. | SPMMAT 01 04 03 DCEC 3104 | Advanced Numerical Analysis | 3 | 1 | 0 | 4 |
| 15. | SPMMAT 01 04 04 DCEC 3104 | Theory of Elasticity | 3 | 1 | 0 | 4 |
| 16. | SPMMAT 01 04 05 DCEC 3104 | Advanced Complex Analysis | 3 | 1 | 0 | 4 |
| 17. | SPMMAT 01 04 06 DCEC 3104 | Cryptography | 3 | 1 | 0 | 4 |
| 18. | SPMMAT 01 04 07 DCEC 3104 | Advanced Abstract Algebra | 3 | 1 | 0 | 4 |
| 19. | SPMMAT 01 04 08 DCEC 3104 | Measure Theory and Integration | 3 | 1 | 0 | 4 |
| 20 | SPMMAT 01 04 09 DCEC 3104 | Functional Analysis | 3 | 1 | 0 | 4 |
| 21 | SPMMAT 01 04 10 DCEC 3104 | Complex Dynamics | 3 | 1 | 0 | 4 |

## GENERIC ELECTIVE COURSE (GEC)

**(Offered to PG students of other departments only)**

| S. No. | Course code | Course title | L | T | P | Credit |
|---|---|---|---|---|---|---|
| 1. | SPMMAT 01 01 01 GEC 3104 | Introduction to Mathematical Analysis | 3 | 1 | 0 | 4 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 2. | SPMMAT 01 01 02 GEC 2124 | Programming in C | 3 | 0 | 2 | 4 |
| 3. | SPMMAT 01 01 03 GEC 3104 | Mathematics for Chemists | 3 | 1 | 0 | 4 |
| 4. | SPMMAT 01 02 01 GEC 2124 | Typesetting in Latex | 2 | 1 | 2 | 4 |
| 5. | SPMMAT 01 02 02 GEC 2124 | Numerical Methods and C | 2 | 1 | 2 | 4 |
| 6. | SPMMAT 01 02 03 GEC 3104 | Discrete Mathematics | 3 | 1 | 0 | 4 |

**Note:** Any MOOCs course for PG students on SWAYAM can also be taken as DCEC or GEC course on the recommendations of the department.

**Skill Enhancement Elective Course** (Compulsory and exclusively for M.Sc. Mathematics students, non-credit, only qualifying in nature) this may include a course based on Theoretical/Experimental/Computational Techniques/Methods. The department may offer more than one courses depending on specialization and strength of faculty members, and the student has to opt one of them.

# Semester I

**Total credits: 24 (C: 20, GEC: 4)**

| S. No. | Course Title | Course Code | L | T | P | Credits |
|---|---|---|---|---|---|---|
| 1 | Real Analysis | SPMMAT 01 01 01 C 3104 | 3 | 1 | 0 | 4 |
| 2 | Algebra-I | SPMMAT 01 01 02 C 3104 | 3 | 1 | 0 | 4 |
| 3 | Complex Analysis | SPMMAT 01 01 03 C 3104 | 3 | 1 | 0 | 4 |
| 4 | Differential Equations | SPMMAT 01 01 04 C 3104 | 3 | 1 | 0 | 4 |
| 5 | Programming in C | SPMMAT 01 01 05 C 2023 | 3 | 0 | 2 | 4 |
| 6 | MOOC/GEC (to be taken from other departments) | | - | - | - | 4 |

**GEC courses offered to PG students of other departments only**

| | |
|---|---|
| Introduction to Mathematical Analysis | SPMMAT 01 01 01 GEC 3104 |
| Programming in C | SPMMAT 01 01 02 GEC 3024 |
| Mathematics for Chemists | SPMMAT 01 01 03 GEC 3104 |

# Semester II

**Total credits: 24 (C: 16, DCEC: 4, GEC: 4)**

| S. No. | Course | Course Code | L | T | P | Credits |
|---|---|---|---|---|---|---|
| 1 | Linear Algebra | SPMMAT 01 02 01 C 3104 | 3 | 1 | 0 | 4 |
| 2 | Topology | SPMMAT 01 02 02 C 3104 | 3 | 1 | 0 | 4 |
| 3 | Numerical Analysis | SPMMAT 01 02 03 C 3125 | 3 | 1 | 2 | 5 |
| 4 | Typesetting in Latex | SPMMAT 01 02 04 C 2023 | 2 | 0 | 2 | 3 |
| 5 | MOOC/DCEC | | - | - | - | 4 |
| 6 | MOOC/GEC (to be taken from other departments) | | - | - | - | 4 |

**GEC courses offered to PG students of other departments only**

| | |
|---|---|
| Typesetting in LaTeX | SPMMAT 01 02 01 GEC 2124 |
| Numerical Methods and C | SPMMAT 01 02 02 GEC 2124 |
| Discrete Mathematics | SPMMAT 01 02 03 GEC 3104 |

**DCEC courses for M.Sc. (Mathematics) students only**

| | |
|---|---|
| Wavelet Analysis | SPMMAT 01 02 01 DCEC 3104 |
| Object Oriented Programming C++ | SPMMAT 01 02 02 DCEC 2124 |
| Information Theory | SPMMAT 01 02 03 DCEC 3104 |
| Number Theory | SPMMAT 01 02 04 DCEC 3104 |
| Operation Research | SPMMAT 01 02 05 DCEC 3104 |

# Semester III

**Total credits: 24 (C: 16, DCEC: 8)**

| S. No. | Course | Course Code | L | T | P | Credits |
|---|---|---|---|---|---|---|
| 1 | Integral Equations and Calculus of Variation | SPMMAT 01 03 01 C 3104 | 3 | 1 | 0 | 4 |
| 2 | Mechanics | SPMMAT 01 03 02 C 3104 | 3 | 1 | 0 | 4 |
| 3 | Mathematical Statistics | SPMMAT 01 03 03 C 3104 | 3 | 1 | 0 | 4 |
| 4 | Seminar | SPMMAT 01 03 04 C 4004 | 0 | 0 | 8 | 4 |
| 5 | MOOC/DCEC | | - | - | - | 4 |
| 6 | MOOC/DCEC | | - | - | - | 4 |

**GEC courses may be selected from GEC courses of semester I, if he/she has not studied that paper in Ist semester.**

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**DCEC courses for M.Sc. (Mathematics) students only**

| | |
|---|---|
| Applied Discrete Mathematics | SPMMAT 01 03 01 DCEC 3104 |
| Finite Element Methods | SPMMAT 01 03 02 DCEC 3104 |
| Algebra – II | SPMMAT 01 03 03 DCEC 3104 |
| Fluid Dynamics | SPMMAT 01 03 04 DCEC 3104 |
| Fuzzy Set Theory | SPMMAT 01 03 05 DCEC 3104 |
| Programming in MATLAB | SPMMAT 01 03 06 DCEC 2124 |

# Semester IV

**Total credits: 24 (C: 12, DCEC: 12)**

| S. No. | Course | Course Code | L | T | P | Credits |
|---|---|---|---|---|---|---|
| 1 | MOOC/DCEC | | 3 | 1 | 0 | 4 |
| 2 | MOOC/DCEC | | 3 | 1 | 0 | 4 |
| 3 | MOOC/DCEC | | 3 | 1 | 0 | 4 |
| 4 | Project/Dissertation | SPMMAT 01 04 01 C | - | - | - | 12 |
| 5 | SEEC | | - | - | - | 0 |

**GEC courses may be selected from GEC courses of semester II, if he/she has not studied that paper in IInd semester.**

**DCEC courses for M.Sc. (Mathematics) students only**

| | |
|---|---|
| Differential Geometry | SPMMAT 01 04 01 DCEC 3104 |
| Mathematical Modelling | SPMMAT 01 04 02 DCEC 3104 |
| Advanced Numerical Analysis | SPMMAT 01 04 03 DCEC 3104 |
| Theory of Elasticity | SPMMAT 01 04 04 DCEC 3104 |
| Advanced Complex Analysis | SPMMAT 01 04 05 DCEC 3104 |
| Introduction to Cryptography | SPMMAT 01 04 06 DCEC 3104 |
| Advanced Abstract Algebra | SPMMAT 01 04 07 DCEC 3104 |
| Measure Theory and Integration | SPMMAT 01 04 08 DCEC 3104 |
| Functional Analysis | SPMMAT 01 04 09 DCEC 3104 |

OR

**Total credits: 24 (C: 24)***

| S. No. | Course | Course Code | L | T | P | Credits |
|---|---|---|---|---|---|---|
| 1 | Semester-long Project/Dissertation | SPMMAT 01 04 02 C | - | - | - | 24 |

***Allowed only on Departmental Committee Recommendations**

**SEEC** (Skill Enhancement Elective Course, non-credit, only qualifying in nature): This may include a course based on Theoretical/Experimental/Computational Techniques/Methods. The department may offer more than one courses depending on specialization and strength of faculty members, and the student has to opt one of them. The course code may be given as: SPMMAT 01 04 0X SEEC 3100, X=1, 2, 3 ... etc.

# SEMESTER - I

## REAL ANALYSIS

**(SPMMAT 01 01 01 C 3104)**

### UNIT – I

Real number system as complete ordered field, Archimedean property, supremum, infimum, Bolzano-Weierstrass property, sequence and series, convergence, limsup, liminf, continuity, uniform continuity.

### UNIT- II

Space of continuous functions, sequence and series of functions, uniform and pointwise convergence, Riemann sums and Riemann integral, Monotonic functions, types of discontinuity.

### UNIT - III

Function of bounded variation, total variations, function of bounded variations expressed as difference of increasing functions, function of several variables, directional derivatives, partial derivative, derivative as a linear transformation, inverse and implicit function theorems.

### UNIT- IV

Metric space and examples, open sets, closed sets, sequences in metric spaces and convergence, compactness, sequential compactness, continuity and compactness, Heine-Borel theorem, connected and path connected spaces, components, Continuity and connectedness.

***Suggested Readings:***

1. Simmons, G. F. *Introduction to Topology and Modern Analysis*. McGraw-Hill Pvt. Ltd. 2016.
2. Apostol, T. M. *Mathematical Analysis*. Fifth edition. *Wesley Publishing Co.* 1981.
3. Kumaresan, S. *Topology of Metric Spaces*. Narosa Publishing House, 2011.
4. Walter, R. *Principles of Mathematical Analysis*. 3rd edition, McGraw-Hill, 1976.
5. Malik, S. C. and Arora, S. *Mathematical Analysis*. 2nd edition reprint. New Age International Publishers 2005.
6. Royden, H. L. *Real Analysis*, Macmillan Pub. Co., Inc. 4th edition, New York, 1993.
7. Somasundram, D. and Chaudhary, B. *A First Course in Mathematical Analysis*. Narosa Publishing House, 1996.
8. Terence T. *Analysis II*. Hindustan Book Agency, 2009.

## ALGEBRA - I

## (SPMMAT 01 01 02 C 3104)

### UNIT - I

Groups, subgroup, normal subgroup, quotient group, homomorphism and isomorphism, cyclic group, permutation group, Cayley's theorem, Lagrange theorem

### UNIT - II

Class equation, Cauchy's theorem, Sylow p-subgroups and its applications, Sylow theorems, Direct product of groups, Structure of finitely generated abelian groups, description of group of order $p^2$ and $pq$, where $p$ and $q$ are distinct primes(In general survey of groups upto order 15).

### UNIT – III

Rings, examples (including polynomial rings, formal power series rings, matrix rings and group rings, integral domains, division rings , fields), ideals, prime and maximal ideals, rings of fractions, Chinese remainder theorem for pairwise co-maximal ideals, homomorphism and isomorphism of rings.

### UNIT-IV

Factorization in domains, euclidean domains, principal ideal domains and unique factorizations domains, polynomial rings over UFD, polynomial rings over field, irreducibility criteria

***Suggested Readings:***

1. Gallian, J. A. *Contemporary Abstract Algebra*. 9th edition. Cengage Learning, 2015.
2. Herstein, I. N. *Topics in Algebra*. 2nd edition. John Wiley and Sons, 2006.
3. Khanna, V. K. and Bhammbri, S. K. *A Course in Abstract Algebra*. Vikas Publishing house, 1999.
4. Bhattacharya, P. B. Jain, S. K. and Nagpaul, S. R. *Basic Abstract Algebra*. 2nd edition, Cambridge University Press, 2003.
5. Lang, S. *Algebra*. 3rd edition, Springer 2012.
6. Luther, S. and Passi, I. B. S. *Algebra*. Vol. I-Groups, Vol. II-Rings, Narosa Publishing House (Vol. I – 1996, Vol. II –1990).
7. Cohn, P. M. *Algebra*. Vols. I & II, John Wiley & Sons, 1991.

## COMPLEX ANALYSIS

## (SPMMAT 01 01 03 C 3104)

### UNIT-I

Continuity and differentiability of complex function, Cauchy-Riemann equations, harmonic functions, analytic functions, analytic functions as mapping, the exponential function, trigonometric functions, hyperbolic functions, logarithmic functions, branch point, branch cut.

### UNIT-II

Power series representation of analytic functions, zeros of analytic functions, the index of a closed curve, Cauchy's theorem and integral formula, homotopic version of Cauchy's theorem and simple connectivity, counting zeros, Rouche's theorem, Liouville's Theorem, the open mapping theorem, Goursat theorem, Morera's theorem.

### UNIT-III

Taylor's series, Laurent's series, classification of singularities, residues, argument principle and their applications, contour integrals

### UNIT-IV

Maximum modulus theorem, Schwarz's lemma and their applications. Mobius transformations, conformal mapping.

***Suggested Readings:***

1. Conway, J. B. Functions of One Complex Variable, Springer, 2012.
2. Brown, J. B. and Churchill, R. V. *Complex Variables and Applications*. 8th edition, Tata McGraw-Hill Education, 2009.
3. Mathews, J. H. and Howell, R. W. *Complex Analysis for Mathematics and Engineering*. Jones & Bartlett Publishers, 2012.
4. Copson, E. T. *Theory of Functions of Complex Variables*. Oxford University Press, 1970.
5. Saff, E. B. and Snider, A. D. *Fundamentals of Complex Analysis with Applications to Engineering and Sciences*. Pearson Education, 2014.
6. Ponnusamy, S. *Foundations of Complex Analysis*. Alpha Science International, 2005.

## DIFFERENTIAL EQUATIONS

## (SPMMAT 01 01 04 C 3104)

### UNIT-I

Preliminaries of ODE and PDE, existence and uniqueness theorems, existence of independent solutions, Wronskian, Abel's formula, trajectories, orthogonality of functions, orthonormal set of functions, singular solutions of first order ODEs, system of first order ODEs, phase diagram, critical points (saddle, node, spiral etc).

### UNIT-II

General theory of homogeneous and non-homogeneous linear differential equations, Sturm Liouville's boundary value problems, Green's function, regular and singular points, power series solution of differential equation at regular and irregular singular points, Bessel's and Legendre's equations and their solutions.

### UNIT-III

Curves and surfaces in three dimensions, origin of PDEs, Lagrange's method, orthogonal surfaces, Charpit's method and Jacobi method, special types of first order PDEs, Cauchy problem for first order PDEs

### UNIT-IV

Solutions of higher order linear PDEs, method of separation of variables for Laplace, heat, wave and diffusion equations, Canonical form and reduction to canonical form. One and two parameters family of surfaces.

***Suggested Readings:***

1. Simmons, G. F. *Differential Equations with Applications and Historical Notes*. 2nd edition, Tata McGraw Hill, New Delhi, 2016.
2. Lebedev, N. N. *Special Functions and Their Applications. Revised*, Courier Corporation, 2012.
3. Bell, W. W. *Special Functions for Scientists and Engineers*. Courier Corporation, 2004.
4. Reid, W. T. *Ordinary Differential Equations*. John Wiley and Sons, New York, 1971.
5. Raisinghania, M. D. *Advanced Differential Equations*. S. Chand & Company Ltd., New Delhi, 2001.
6. Ross, S. L. *Differential Equations*. 3rd edition, Wiley India, 2007.
7. Sneddon, I. N. *Elements of Partial Differential Equations*. Dover Publications, 2006.

## PROGRAMMING IN C

## (SPMMAT 01 01 05 C 3024)

### Unit-I

An overview of programming, programming languages, classification, C essentials program development, anatomy of a C function, variables, constants, expressions, assignment statements, formatting source files, continuation character, the pre-processor, scalar data types-declarations, different types of integers, different kinds of integer constants, floating point types, initialization, mixing types, explicit conversions-casts, data types.

### Unit-II

Operators and expressions - precedence and associatively, unary plus and minus operators, binary arithmetic operators, arithmetic assignment operators, increment and decrement operators, comma operator, relational operators, logical operators, bit manipulation operators, bitwise assignment operators, cast operator, size of operators, conditional operator, memory operators, input/output functions.

### Unit-III

Control Flow - conditional branching, the switch statement, looping, nested loops, break and continue statements, goto statement, infinite loops, Arrays - declaring an array, arrays and memory, initializing arrays, encryption and decryption, multidimensional arrays, strings.

### Unit-IV

Functions - passing arguments, declarations and calls, recursion, the main ( ) function, passing arrays as function arguments. Pointers - pointer arithmetic, accessing array elements through pointers, passing pointers as function arguments, arrays of pointers.

*Suggested Readings:*

1. Balagurusamy, E. *Programming in ANSI C.* 3rd edition. TATA McGraw Hill, 2016.
2. Darnell, P. A. and Margolis, P. E. *C: A Software Engineering Approach*. Narosa Publishing, House (Springer International Student Edition), 2012.
3. Yashavant, P. K. *Let Us C*. BPB Publication, 2008.
4. Byrons, G. *Programming With C*. 2nd edition, Schaum's Series, 1996.
5. Brain W. K. and Ritchie D. M. *The C Programme Language*. 2nd edition, Prentice Hall, 1989.

# GEC COURSES OFFERED TO PG STUDENTS OF OTHER DEPARTMENTS

## INTRODUCTION TO MATHEMATICAL ANALYSIS

## (SPMMAT 01 01 01 GEC 3104)

### UNIT-I

Sets, different kinds of sets, infinite and finite sets, countability, types of relations – void, universal, reflexive, symmetric, transitive and equivalence classes, complex numbers, graphic representation and properties, polar form of complex numbers, de Movier's theorem.

### UNIT-I

Functions, domain, co-domain, range, classification of real functions, algebraic and transcendental functions, even and odd functions, periodic functions, graphs of some important functions.

### UNIT-III

Definition of sequence and its convergence, series and convergence. Quadratic equations and roots, nature of roots.

### UNIT-IV

Limits, continuity and differentiability: Limit of a function, fundamental theorem on limits, methods of evaluating limits, existence of limit, left hand and right hand limit, continuity at a point, continuity in an interval, differentiability of a function at a point and in an interval, geometrical interpretation.

***Suggested Readings:***

1. Malik, S. C. and Arora, S. *Mathematical Analysis*. 2nd edition. New Age International Publishers, 2005.
2. Walter, R. *Principles of Mathematical Analysis*. 3rd edition, McGraw-Hill, 1976.
3. Royden, H. L. *Real Analysis*, Macmillan Pub. Co., Inc. 4th complex anEdition, New York, 1993.
4. Somasundram, D. and Chaudhary, B. *A First Course in Mathematical Analysis*. Narosa Publishing House, 1996.
5. Ram, B. *Discrete Mathematics*. Pearson Education, 2012.

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## PROGRAMMING IN C

## (SPMMAT 01 01 02 GEC 3024)

### Unit-I

An overview of programming, programming languages, classification, C essentials program development, anatomy of a C function, variables, constants, expressions, assignment statements, formatting source files, continuation character, the pre-processor, scalar data types-declarations, different types of integers, different kinds of integer constants, floating point types, initialization, mixing types, explicit conversions-casts, data types.

### Unit-II

Operators and expressions - precedence and associatively, unary plus and minus operators, binary arithmetic operators, arithmetic assignment operators, increment and decrement operators, comma operator, relational operators, logical operators, bit manipulation operators, bitwise assignment operators, cast operator, size of operators, conditional operator, memory operators, input/output functions.

### Unit-III

Control Flow - conditional branching, the switch statement, looping, nested loops, break and continue statements, goto statement, infinite loops, Arrays - declaring an array, arrays and memory, initializing arrays, encryption and decryption, multidimensional arrays, strings.

### Unit-IV

Functions - passing arguments, declarations and calls, recursion, the main ( ) function, passing arrays as function arguments. Pointers - pointer arithmetic, accessing array elements through pointers, passing pointers as function arguments, arrays of pointers.

***Suggested Readings:***


1. Balagurusamy, E. *Programming in ANSI C.* 3rd edition. TATA McGraw Hill, 2016.
2. Darnell, P. A. and Margolis, P. E. *C: A Software Engineering Approach.* Narosa Publishing, House (Springer International Student Edition), 2012.
3. Yashavant, P. K. *Let Us C.* BPB Publication, 2008.
4. Byrons, G. *Programming With C.* 2nd edition, Schaum's Series, 1996.
5. Brain W. K. and Ritchie D. M. *The C Programme Language.* 2nd edition, Prentice Hall, 1989.

## MATHEMATICS FOR CHEMISTS

## (SPMMAT 01 01 03 GEC 3104)

### UNIT-I

Algebraic, transcendental functions, approximation, errors in approximation, absolute, relative and percentage errors, matrices and their properties, some special matrices, matrix algebra, the inverse matrix, linear transformations, orthogonal matrices and orthogonal transformations.

### UNIT-II

Solution of differential equations, first-order linear equations- separable equations, homogeneous linear equations, non-homogeneous linear equations, second-order differential equations with constant coefficients, general solution, particular solution, linear equations in chemical kinetics, harmonic oscillator and some other applications.

### UNIT-III

Singular points, power series solution of differential equation at regular and irregular singular points, Bessel's and Legendre's equations and their solutions, partial differentiation, types of partial differential equations.
Line integrals, double integrals, change of variables, polar coordinates, volume integrals, Laplacian operator, finite difference operators.

### UNIT-IV

Descriptive statistics, measures of central tendency, measures of dispersion, frequency and probability, permutations and combinations, binomial distribution, Gaussian distribution.

***Suggested Readings:***

1. Steiner, E. *The Chemistry Maths Book*. 2nd edition, Oxford University Press, 2008.
2. Raisinghania, M. D. *Advanced Differential Equations*. S. Chand & Company Ltd. New Delhi, 2001.
3. Gupta, S. C. and Kapoor, V. K. *Fundamentals of Mathematical Statistics*. S. Chand & Sons, 2014.
4. Lipschutz, S. and Lipson, M. *Linear Algebra*. 3rd edition, Tata McGraw-Hill, 2005.

# SEMESTER – II

## LINEAR ALGEBRA

**(SPMMAT 01 02 01 C 3104)**

### UNIT-I

System of linear equation, vector spaces: definition and examples, subspaces, linear dependence, basis and dimension, sum and direct sum, quotient spaces, linear transformations: kernel and image of a linear transformation, rank and nullity of a linear transformation, matrix mappings.

### UNIT-II

Linear mappings and matrices: matrix representation of linear transformation, change of basis, similarity, polynomial of matrices, characteristic polynomial, Cayley-Hamilton theorem, diagonalization, minimal polynomial, companion matrix.

### UNIT-III

Canonical and bilinear forms: triangular form, invariance, primary decomposition, Jordon canonical form, rational canonical form, bilinear and quadratic forms, reduction and classification of quadratic forms

### UNIT-IV

Inner product space, examples and properties, norms and distances, orthonormal basis, the Gram-Schmidt orthogonalization, orthogonal complements, the adjoint of a linear operator on an inner product space, normal and self-adjoint operators, unitary operators.

***Suggested Books:***

1. Lipschutz, S. and Lipson, M. *Linear Algebra*. 3rd edition, Tata McGraw-Hill, 2005.
2. Lang, S. *Linear Algebra*. 3rd edition, Springer-Verlag, NewYork, 2013.
3. Hoffman, K. and Kunze, R. *Linear Algebra*. 2nd edition, Prentice Hall, 1971.
4. Axler, S. *Linear Algebra Done Right*. 2nd edition, Springer-Verlag, 2014.

## TOPOLOGY

## (SPMMAT 01 02 02 C 3104)

### UNIT – I

Elementary set theory, finite, countable and uncountable sets, definition and examples of topological spaces, basis and sub-basis, open sets, closed sets, interior points, limit points, boundary points, exterior points of a set, closure of a set, derived set, Hausdorff spaces.

### UNIT – II

Subspace topology, continuous functions, metric topology, convergence of sequences, sequential continuity, open and closed mappings, homeomorphism, pasting lemma, product topology. Tychonoff theorem.

### UNIT – III

Connectedness, continuity and connectedness, connected subsets of the real line, components, path connectedness, locally connected, locally path connected. compactness and its characterizations, compact subspace of the real line, continuity and compact sets, compactness and finite intersection property

### UNIT – IV

Countability and separation axioms, T0, T1, T2, Lindelof spaces, regular and normal Spaces, Urysohn Lemma, metrization theorems (Urysohn metrization, Nagata-Smirnov metrization theorem), Tietze extension theorem, compactification.

***Suggested Readings:***

1. Munkres, J. R. *Toplogy*. Pearson Education, 2017.
2. Simmons, G. F. *Introduction to Topology and Modern Analysis*. Tata McGraw-Hill Education, 2016.
3. Joshi, K. D. *Introduction to General Topology*. Wiley Eastern Ltd, 1983.
4. Kelley, J. L. *General Topology*. 2nd edition, Springer, New York, 1991.
5. Pervin, W. J. *Foundations of General Topology*. Academic Press, 2014.
6. Singh, T. B. *Elements of Topology*. CRC Press, Taylor Francis, 2013.

## NUMERICAL ANALYSIS

## (SPMMAT 01 02 03 C 3125)

### UNIT-I

Errors in approximation, absolute, relative and percentage errors, round-off error. Solution of algebraic and transcendental equations: bisection method, Regula Falsi method, method of iteration, Newton Raphson method, order of convergence. Systems of simultaneous equations: Gauss elimination method, Gauss Jordon method, LU decomposition method, Iterative methods: Jacobi method and Gauss-Seidel method.

### UNIT-II

Finite differences, Interpolation techniques: interpolation with equal intervals-Newton forward and backward , Newton Backward, Gauss forward, Gauss Backward, Stirling, Bessel formulae. Interpolation with unequal intervals-Newton's divided difference method, Lagrange method. Hermite interpolation

### UNIT-III

Numerical differentiation using Newton forward and backward formulae. Numerical integration: Newton-Cotes formulas, trapezoidal rule, Simpson rule, Gauss-Legendre, Gauss-Chebyshev formulas, Romberg's integration, double integrals, Curve fitting: straight line fitting, parabolic curve fitting, fitting of exponential curve, fitting of other curves. Cubic splines

### UNIT-IV

Solution of ordinary differential equations: Taylor series method, Picard's method, Euler method, Euler modified method, Runge – Kutta methods, Milne's and Adam's predictor and corrector methods. Finite difference method for boundary value problems.

***Suggested Readings:***

1. Mathews, J. H. *Numerical Methods for Mathematics, Science and Engineering*. Prentice-Hall, International Editions, 1992.
2. Jain, M. K., Iyengar, S. R. K. and Jain, R. K. *Numerical Methods for Scientific & Engineering Computation*. New Age International, 2012.
3. Thangaraj, P. *Computer Oriented Numerical Methods*. PHI Learning Pvt. Ltd, 2013.
4. Chapra, S. C. and Canale, R. P. *Numerical Methods for Engineers*. McGraw Hill, International Edition, 1998.
5. Burden R. L. and Faires J. D. *Numerical Analysis*. 9th Edition, Cengage Learning, 2011.

## LAB FOR NUMERICAL ANALYSIS

Programming will be set in context with the materials covered in theory in C/C++/MATLAB/ MATHEMATICA/MAPLE

Laboratory Work:

1. To detect the interval(s) which contain(s) root of equation $f(x) = 0$ and implement bisection method to find root of $f(x) = 0$ in the detected interval.
2. To find the root of $f(x) = 0$ using Newton - Raphson and fixed point iteration methods.
3. To compute the intermediate value using the Newton's forward difference interpolation formula.
4. To compute Lagrange and Newton divided difference formulas.
5. To solve linear system of equations using Gauss elimination (without pivoting) method.
6. To solve linear system of equations using Gauss-Seidel method.
7. To find the dominant eigenvalues and associated eigen vector by Rayleigh power method.
8. To integrate a function numerically using trapezoidal and Simpson's rule.
9. To solve the initial value problem using Euler and modified Euler's methods.
10. To solve the initial value problem using Runge-Kutta methods.

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## TYPESETTING IN LATEX

## (SPMMAT 01 02 04 C 2023)

### UNIT I

Preparing an input file, sentences and paragraphs, the document class, sectioning, display material, running Latex, changing the type style, producing mathematical symbols and mathematical formulae, arrays, delimiters, multiline formulae, putting one thing on other, spacing in math mode.

### UNIT II

Defining command and environments, producing and including graphics in a Latex file, figures and other floating bodies, lining it up in columns, table of content, cross-reference, bibliography and citation, making index and glossary, slides, overlays and notes, letters.

### UNIT III

Design it yourself: document class, page style, title page, customizing the style, line and page breaking, numbering, length, spaces and boxes, formatting with boxes, centring and flushing, list making environments, changing font type size and special symbols, picture, picture environments, picture objects, text, boxes, straight lines, arrow, stacks, circles, oval, framing, curve, grid, repeat patterns.

### UNIT IV

Making presentation slides in beamer class Latex, various styles in beamer presentation, dynamic slides. postscript macros for generic tex (pstrix): arguments, dimension, coordinates, angles, line styles, fill styles, custom styles, custom graphics, picture tools, text tricks, node and connection special tricks, basics of mathjax, mathjax configuration options.

***Suggested Readings:***


1. Leslie L. *A Document Preparation System User's Guide and Reference Manual*, Addison-Wesley Publishing Company, 2001.
2. Kottwitz, S. *LaTeX Beginner's Guide*. Packt Publishing Ltd., UK, 2011.
3. Tantau,T. User Guide to the Beamer Class, http://latex-beamer.sourceforge.net.
4. Oetiker,T. The Not So Short Introduction to LATEX2E, https://tobi.oetiker.ch/lshort/lshort.pdf.

## GEC COURSES OFFRED TO PG STUDENTS OF OTHER DEPARTMENTS

### TYPESETTING IN LATEX

### (SPMMAT 01 02 01 GEC 2124)

### UNIT I

Preparing an input file, sentences and paragraphs, the document class, sectioning, display material, running Latex, changing the type style, producing mathematical symbols and mathematical formulae, arrays, delimiters, multiline formulae, putting one thing on other, spacing in math mode.

### UNIT II

Defining command and environments, producing and including graphics in a Latex file, figures and other floating bodies, lining it up in columns, table of content, cross-reference, bibliography and citation, making index and glossary, slides, overlays and notes, letters.

### UNIT III

Design it yourself: document class, page style, title page, customizing the style, line and page breaking, numbering, length, spaces and boxes, formatting with boxes, centring and flushing, list making environments, changing font type size and special symbols, picture, picture environments, picture objects, text, boxes, straight lines, arrow, stacks, circles, oval, framing, curve, grid, repeat patterns.

### UNIT IV

Making presentation slides in beamer class Latex, various styles in beamer presentation, dynamic slides, postscript macros for generic tex (pstrix): arguments, dimension, coordinates, angles, line styles, fill styles, custom styles, custom graphics, picture tools, text tricks, node and connection special tricks, basics of mathjax, mathjax configuration options.

***Suggested Readings:***

1. Leslie L. *A Document Preparation System User's Guide and Reference Manual*, Addison-Wesley Publishing Company, 2001.
2. Kottwitz, S. *LaTeX Beginner's Guide*. Packt Publishing Ltd., UK, 2011.
3. Tantau,T. User Guide to the Beamer Class, http://latex-beamer.sourceforge.net.
4. Oetiker,T. The Not So Short Introduction to LATEX2E, https://tobi.oetiker.ch/lshort/lshort.pdf.

## NUMERICAL METHODS AND C

## (SPMMAT 01 02 02 GEC 2124)

### UNIT-I

Errors in approximation, absolute, relative and percentage errors. Solution of algebraic and transcendental equations: bisection method, Newton Raphson method.
Systems of simultaneous equations: Cramer's rule, matrix inversion method, Gauss elimination method, Gauss Jordon method, LU decomposition method, Jacobi and Gauss-Seidel iterative methods.

### UNIT-II

Eigenvalues and eigenvectors: eigenvalues, eigenvectors, Cayley Hamilton theorem, power method for finding largest eigenvalue, least square curve fit- straight line fitting, parabolic curve fitting, fitting of exponential curve, fitting of other curves.

### UNIT-III

Finite differences: forward, backward and central differences, Newton's forward and backward interpolation formulae, Lagrange's interpolation formula, Gauss forward, backward formulae, Stirling formula, Bessel formula.

### UNIT-IV

Numerical differentiation and integration: Newton's forward and backward difference formulae for differentiation, trapezoidal and Simpson's rules for numerical integration, double integrals.

***Suggested Readings:***

1. Jain, M. K., Iyengar, S. R. K. and Jain, R. K. *Numerical Methods for Scientific & Engineering Computation*. New Age International, 2012.
2. Atkinson, K. E. *An Introduction to Numerical Analysis*. John Wiley & Sons, 1989.
3. Conte, S. D. and Boor, C. D. *Elementary Numerical Analysis*. An Algorithmic Approach, Tata McGraw Hill, New Delhi, 1981.
4. Isacson, E. and Keller, H. B. *Analysis of Numerical Methods*. John Wiley & Sons, 1994.
5. Thangaraj, P. *Computer Oriented Numerical Methods*. PHI Learning Pvt. Ltd, 2013.
6. Burden R. L. and Faires J. D. *Numerical Analysis*. 9th Edition, Cengage Learning, 2011.

## LAB FOR NUMERICAL METHODS AND C

Programming will be set in context with the materials covered in theory in C.

Laboratory Work:

1. To detect the interval(s) which contain(s) root of equation $f(x) = 0$ and implement bisection method to find root of $f(x) = 0$ in the detected interval.
2. To find the root of $f(x) = 0$ using Newton - Raphson and fixed point iteration methods.
3. To compute the intermediate value using the Newton's forward difference interpolation formula.
4. To compute Lagrange and Newton divided difference formulas.
5. To solve linear system of equations using Gauss elimination (without pivoting) method.
6. To solve linear system of equations using Gauss-Seidel method.
7. To find the dominant eigenvalues and associated eigen vector by Rayleigh power method.
8. To integrate a function numerically using trapezoidal and Simpson's rule.

## DISCRETE MATHEMATICS

**(SPMMAT 01 02 03 GEC 3104)**

### UNIT-I

Mathematical Logic: Statement and notations, proposition and logic operations, connectives (conjunction, disjunction, negation), statement formulas and truth tables, propositions generated by set, equivalence of formulas and implication laws of logic, mathematical systems, propositions over a universe, principal of mathematical induction, variables, quantifiers.

### UNIT-II

Relation and Function: Binary relations, properties of binary relation in a set, equivalence relations, composition of binary relations, partial ordering and partial order set, Hasse diagram, function and Pigeon hole principle, recursion definition, many faces of recursion, recurrence relations, common recurrence relations, generating functions and their solutions.

### UNIT-III

Boolean algebra: Posets, lattice and basic properties of Boolean algebraic, principle of duality, distributive and complemented lattices, uniqueness of finite Boolean algebra, Boolean functions and Boolean expressions, normal forms of Boolean expression and simplifications of Boolean expressions, basic circuits and theorems, logical gates and relations of Boolean function.

### UNIT-IV

Graph theory: Basic terminology of graph theory, paths, circuits, graph connectivity, Eulerian paths, multigraphs, weighted graphs. Trees, spanning trees, binary trees, rooted trees, planar graphs, Eulers theorem. The Konigsberg bridge problem and Eulerian graphs, Hamiltonian graphs.

***Suggested Readings:***

1. Rosen, K. H. *Discrete Mathematics and Its Applications*. 7th edition, Tata McGraw Hill, 2011.
2. Trembley, J. P. and Manohar, R. *A First Course in Discrete Structure with applications to Computer Science*. Tata McGraw Hill, 1999.
3. Khanna, V. K. *Lattices and Boolean Algebras*. PHI Publication, 2004.
4. Liu, C. L. *Elements of Discrete Mathematics*. Tata McGraw Hill, 2000.
5. Ram, B. Discrete Mathematics, Pearson Education, 2012.
6. Lipschutz, S., Lipson, M. L. and Patil, V. H. *Discrete Mathematics*. Schaum's Outline Series, Tata McGraw-Hill Education, 2006.

## DCEC COURSES OFFRED TO M.SC. (MATHEMATICS) STUDENTS ONLY

### WAVELET ANALYSIS

### (SPMMAT 01 02 01 DCEC 3104)

### UNIT-I

Review of inner product spaces, orthonormal systems, frames in $C^n$, frames algorithms, frames and Bessel sequences in infinite dimensional Hilbert spaces, frame sequence, the Gram matrix associated with Bessel sequences.

### UNIT-II

Frames and operators, characterization of frames, dual frames, tight frames. Riesz bases, frames versus Riesz bases, conditions for a frame being a Riesz basis, frames containing a Riesz basis, perturbation of frames.

### UNIT-III

Wavelets, Haar wavelets, basic properties of the Haar scaling function, Haar decomposition and reconstruction algorithms, the Daubechies wavelets, wavelet bases, scaling function. multiresolution analysis (MRA), construction of wavelets from MRA.

### UNIT-IV

Windowed Fourier transform (WFT), continuous Fourier transform (CFT), continuous wavelet transform (CWT), comparison between CFT and CWT, continuous wavelet transform as an operator, inversion formula for continuous wavelet transform.

***Suggested Readings:***

1. Christensen, O. *An Introduction to Frames and Riesz Bases*. Birkhauser, 2003.
2. Boggess, A. and Narcowich, F.J. *A First Course in Wavelets and Fourier Analysis*. John Wiley & Sons, 2010.
3. Mallat, S. *A Wavelet Tour of Signal Processing*. Academic Press, 2009.
4. Harnendez, E. and Weiss, G. *A First Course on Wavelets*, CRC Press, 1996.
5. Han, D., Kornelson, K., Larson, D. and Weber, E. *Frames for Undergraduates*, Student Math.Lib.,(AMS) Vol. 40, 2007.

## OBJECT ORIENTED PROGRAMMING WITH C++

**(SPMMAT 01 02 02 DCEC 2124)**

### UNIT - I

Basic concepts of Object-Oriented Programming (OOP). Advantages and applications of OOP. Object-oriented languages. Introduction to C++. Structure of a C++ program. Creating the source files. Compiling and linking. C++ programming basics: input/output, data types, operators, expressions, control structures, library functions.

### UNIT - II

Functions in C++ : Passing arguments to and returning values from functions, inline functions, default arguments, function overloading. Classes and objects : Specifying and using class and object, arrays within a class, arrays of objects, object as a function arguments, friendly functions, pointers to members.

### UNIT - III

Constructors and destructors. Operator overloading and type conversions. Inheritance: Derived class and their constructs, Overriding member functions, class hierarchies, public and private inheritance levels. Polymorphism, pointers to objects, this pointer, pointers to derived classes, virtual functions.

### UNIT - IV

Streams, stream classes, unformatted i/o operations, formatted console i/o operations, managing output with manipulators. Classes for file stream operations, opening and closing a file. File pointers and their manipulations, random access. Error handling during file operations, command-line arguments. Exceptional handling.

***Suggested Readings:***

1. Balagrusamy, E. *Object Oriented Programming with C++*. 2nd edition, Tata McGraw Hill Pub. Co, 2013.
2. Lafore, I. S. R. *Object Oriented Programming using C++*. Waite's Group Galgotia Pub, 1994.
3. Gottfried, B. S. *Object Oriented Programming using C++*. Schaum's Outline Series, Tata McGraw Hill Pub. Co., 2000.
4. Barakaki, J. N. *Object Oriented Programming using C++*. Prentice Hall of India, 1996.

## INFORMATION THEORY

## (SPMMAT 01 02 03 DCEC 3104)

### UNIT-I

Measure of information – axioms for a measure of uncertainty, the Shannon entropy and its properties. joint and conditional entropies, transformation and its properties, axiomatic characterization of the Shannon entropy due to Shannon and Fadeev.

### UNIT-II

Noiseless coding - ingredients of noiseless coding problem, uniquely decipherable codes, necessary and sufficient condition for the existence of instantaneous codes, construction of optimal codes.

### UNIT-III

Discrete memoryless channel - classification of channels, information processed by a channel, calculation of channel capacity, decoding schemes the ideal observer, the fundamental theorem of information theory and its strong and weak converses.

### UNIT-IV

Continuous channels - the time-discrete Gaussian channel, uncertainty of an absolutely continuous random variable, the converse to the coding theorem for time-discrete Gaussian channel, the time-continuous Gaussian channel, band-limited channels.

***Suggested Readings:***

1. Ash, R. B. *Information Theory*. Courier Corporation, 2012.
2. Reza, F.M. *An Introduction to Information Theory*. Courier Corporation, 2012.
3. Aczel, J. and Daroczy, Z. *On Measures of Information and their Characterizations*. Academic Press, New York, 1975.
4. Hankerson, H. D., Hartis, G. A. and Johnson, P. D. *Introduction to Information Theory and Data Compression*. Chapman and Hall/CRC, 2nd edition, 2003.

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## NUMBER THEORY

## (SPMMAT 01 03 04 DCEC 3104)

### UNIT – I

Representation of the real numbers by decimals, divisibility, G.C.D and L.C.M., primes, Fermat numbers, congruences and residues, theorems of Euler, Fermat and Wilson, solutions of congruences, linear congruences, Chinese remainder theorem.

### UNIT –II

Arithmetical functions $\varphi(n)$, $\mu(n)$ and $d(n)$ and $\sigma(n)$, Mobius inversion formula, congruences of higher degree, congruences of prime power modulli and prime modulus, power residue.

### UNIT – III

Quadratic residue, Legendre symbols, lemma of Gauss and reciprocity law. Jacobi symbols, irrational numbers, irrationality of $e$ and $\pi$. Finite continued fractions, simple continued fractions, infinite simple continued fractions.

### UNIT – IV

Periodic continued fractions, approximation of irrational numbers by convergents, best possible approximation, Farey series, rational approximation, Pell's equations, Hurwitz theorem, Lagrange four square theorem.

***Suggested Readings:***


1. Burton, D. M. *Elementary Number Theory*. Tata McGraw Hill Publishing House, 2006.
2. Apostol, T. M. *Introduction to Analytic Number Theory*. Springer 2014.
3. Davenport, H. *Higher Arithmetic*. Cambridge University Press, 1999.
4. Hardy, G. H. and Wright, E. M. *Theory of Numbers*. Oxford Science Publications, 2003.
5. Niven, I. and Zuckerman, H. S. *Introduction to the Theory of Numbers*. John Wiley & Sons, 2008.

## OPERATIONS RESEARCH

## (SPMMAT 01 03 05 DCEC 3104)

### UNIT - I

Operations research: origin, definition and scope. linear programming: formulation and solution of linear programming problems by graphical, simplex methods, Big-M and two phase methods, degeneracy, duality in linear programming, sensitivity analysis.

### UNIT - II

Transportation problems: basic feasible solutions, optimum solution by stepping stone and modified distribution methods, unbalanced and degenerate problems, transhipment problem. assignment problems: solution by Hungarian method, unbalanced problem, case of maximization, travelling salesman and crew assignment problems.

### UNIT - III

Queuing models: basic components of a queuing system, general birth-death equations, steady-state solution of Markovian queuing models with single and multiple servers (M/M/1. M/M/C, M/M/1/k, M/M/C/k)

### UNIT- IV

Game theory: two person zero sum game, game with saddle points, rule of dominance; algebraic, graphical and linear programming, concept of mixed strategy. sequencing problems: processing of n jobs through 2 machines, n jobs through 3 machines, 2 jobs through m machines, n jobs through m machines.

***Suggested Readings:***

1. Swarup, K. and Gupta, P. K. *Operations Research*. S. Chand publisher, 1978.
2. Taha, H. A. *Operation Research: An Introduction*. 9th edition, Pearson, 2010.
3. Gupta, P.K. and Hira, D.S. *Introduction to Operations Research*, S. Chand & Co. 2008.
4. Sharma, S. D. Operation Research, Kedar Nath Ram Nath Publications, 1974.
5. Sharma, J. K., *Mathematical Model in Operation Research*, Tata McGraw Hill, 1989.

# SEMESTER – III

## INTEGRAL EQUATIONS AND CALCULUS OF VARIATION

**(SPMMAT 01 03 01 C 3104)**

### UNIT - I

Linear integral equations: Volterra integral equations, Fredholm integral equations, some basic identities, types of kernels: symmetric kernel, separable kernel, iterated kernel, resolvent kernel.

Initial value problems reduced to Volterra integral equations, solution of Volterra integral equation using: resolvent kernel, successive approximation, neumann series method.

### UNIT- II

Boundary value problems reduced to Fredholm integral equations, solution of Fredholm integral equations using separable kernel, resolvent kernel, methods of successive approximation and successive substitution to solve Fredholm equations of second kind, solution of homogeneous Fredholm integral equation, eigen values, eigen vectors.

### UNIT - III

Integral transforms for solving integral equations, basic properties of Laplace transforms, solution of Abel's equation using Laplace transform, application of Laplace transform to the solution of Volterra integral equations with convolution type kernels, solution of integro-differential equations using Laplace transform. Fourier Transform, Fourier sine and cosine transforms.

### UNIT - IV

Extrema of functionals: Euler's equation, sufficient conditions for the extremum of a functional, extension of the variational methods, Brachistochrone problem, geodesics.

***Suggested Readings:***

1. Kanwal, R.P. *Linear Integral Equation. Theory and Techniques*. Academic Press, 2014.
2. Raisinghania M. D. *Integral Equation & Boundary Value Problem*. S. Chand Publishing, 2007.
3. Jerri, A. *Introduction to Integral Equations with Applications*, John Wiley & Sons, 1999.
4. Hildebrand, F. B. *Method of Applied Mathematics*, Courier Corporation, 2012.
5. Wazwaz, A. M. *A First Course in Integral Equations*. World Scientific Publishing Co Inc, 1997.
6. Gelfand, I. M. and Fomin, S. V. *Calculus of Variations*. Courier Corporation, 2012.

## MECHANICS

## (SPMMAT 01 03 02 C 3104)

### UNIT-I

Moments and products of inertia, theorems of parallel and perpendicular axes, principal axes, the momental ellipsoid, equimomental systems, coplanar distributions.

### UNIT-II

Two-dimensional motion of rigid bodies, Euler's dynamical equations for the motion of a rigid body about an axis, theory of small oscillations, generalized coordinates, holonomic and non-holonomic systems. scleronomic and rheonomic systems, Lagrange's equations for a holonomic system, Lagrange's equations for a conservative and impulsive forces, kinetic energy as quadratic function of velocities.

### UNIT-III

Generalized potential, energy equation for conservative fields, Hamilton's variables. Donkin's theorem. Hamilton canonical equations, cyclic coordinates, Routh's equations. Poisson's bracket. Poisson's identity. Jacobi-Poisson theorem. Hamilton's principle, principle of least action.

### UNIT-IV

Poincare Cartan integral invariant. Whittaker's equations. Jacobi's equations. Statement of Lee Hwa Chung's theorem. Hamilton-Jacobi equation. Jacobi theorem. Method of separation of variables. Lagrange brackets, condition of canonical character of a transformation in terms of Lagrange brackets and Poisson brackets, invariance of Lagrange brackets and Poisson brackets under canonical transformations.

***Suggested Readings:***

1. Chorlton, F. *Textbook of Dynamics*. CBS Publishers & Dist. Pvt. Ltd., 2004.
2. Rana, N. C. and Joag, P. C. *Classical Mechanics*. McGraw Hill, 2013.
3. Gantmacher, F. *Lectures in Analytical Mechanics*. Mir Publishers, Moscow, 1975.
4. Louis N. H. and Janet D. F. *Analytical Mechanics*. Cambridge University Press, 1998.
5. Rao, S. K. *Classical Mechanics*. PHI Learning Pvt. Ltd., 2005
6. Spiegel, M. R. *Theoretical Mechanics*, Schaum Outline Series McGraw Hill, 1980.

## MATHEMATICAL STATISTICS

**(SPMMAT 01 03 03 C 3104)**

### UNIT - I

Measures of central tendency and dispersion, moments, measures of skewness and kurtosis, correlation and regression. axiomatic approach to the theory of probability, sample space, additive and multiplicative law of probability, conditional probability. Definition and properties of random variables, discrete and continuous random variables, probability mass and density functions, distribution function. Concepts of bivariate random variables.

### UNIT - II

Mathematical expectation: Definition and its properties. variance, covariance, moment generating function- definitions and their properties. Discrete distributions: Binomial, Poisson and geometric distributions with their properties.

### UNIT - III

Continuous distributions: uniform, exponential, gamma and normal distributions with their properties, Central Limit Theorem (Only statement).

### UNIT – IV

Statistical estimation, Testing of hypothesis: Null and alternative hypotheses, simple and composite hypotheses, two types of errors, t, F and Chi-Square as sampling distribution and applications.

***Suggested Readings:***

1. Gupta, S. C. and Kapoor, V. K. *Fundamentals of Mathematical Statistics.* Sultan Chand & Sons, 2014.
2. Mood, A. M., Graybill, F. A. and Boes, D. C. *Introduction to the Theory of Statistics*, Tata McGraw Hill, 2014.
3. Meyer, P. L. *Introductory Probability and Statistical Applications.* Addison-Wesley Publishing Company, 1970.
4. Baisnab, A. P. and Jas, M. *Element of Probability and Statistics*, Tata McGraw Hill, 1993.
5. Spiegel, M. R., Schiller, J. J. and Srinivasan, R. A. *Probability and Statistics.* Tata McGraw-Hill, 2014.

## DCEC COURSES OFFRED TO M.SC. (MATHEMATICS) STUDENTS ONLY

### APPLIED DISCRETE MATHEMATICS

### (SPMMAT 01 03 01 DCEC 3104)

### UNIT-I

Formal Logic: Statements, proposition, symbolic representation and tautologies, quantifiers, proposition logic.

### UNIT-II

Lattices: Lattices as partially ordered sets, their properties, lattices as algebraic systems, some special lattices, e.g., complete, complemented and distributive lattices, some special lattices e.g., bounded, complemented & distributive lattices.

### UNIT-III

Boolean Algebra: Boolean algebra as lattices, various Boolean identities, the switching algebra example, join - irreducible elements, atoms and minterms, Boolean Forms and their equivalence, minterm Boolean forms, sum of products canonical forms, minimization of Boolean functions, applications of Boolean algebra to switching theory (using AND, OR and NOT gates).

### UNIT-IV

Graph Theory: Definition of graphs, paths, circuits, cycles and subgraphs, induced subgraphs, degree of a vertex, connectivity, planar graphs and their properties, Euler's formula for connected planar graph, complete and complete bipartite graphs. Trees.

*Suggested Readings:*

1. Kenneth H. R. *Discrete Mathematics and Its Applications*, 7th edition, Tata McGraw Hill, 2011.
2. Tremblay, J. P. & Manohar, R. *Discrete Mathematical Structures with Applications to Computer Science*. McGraw Hill Book Co., 1997.
3. Lepschutz, S. and Lipson, M. *Linear Algebra*. 5th edition, Tata McGraw Hill 2012.
4. Liu, C. L. *Elements of Discrete Mathematics*. Tata McGraw Hill, 2000.
5. Ram, B. *Discrete Mathematics*. Pearson Education, 2012.

## FINITE ELEMENT METHODS

## (SPMMAT 01 03 02 DCEC 3104)

### UNIT-I

General theory of finite element methods, difference between finite element and finite difference methods, review of some integral formulae, concept of discretization, different coordinates, one dimensional finite elements, concept of shape functions, stiffness matrix, connectivity, boundary conditions, and equilibrium equation.

### UNIT-II

Numerical integration, construction of shape functions: linear elements (one dimensional bar element, two dimensional-triangular and rectangular elements, three dimensional tetrahedron element).

### UNIT-III

Higher order elements: one dimensional quadratic element, two dimensional triangular element, rectangular element, three dimensional tetrahedron element: quadratic element and higher order elements

### UNIT-IV

Weighted residual and variational approaches (Galerkin method, collocation method, Rayleigh Ritz method etc.), solving one-dimensional problems.

Application of finite element methods for solving various boundary value problems, computer procedures for finite element analysis.

***Suggested Readings:***

1. Rao, S. S. *The Finite Element Method in Engineering*. 5th edition, Butterworth-Heinemann;, 2017.
2. Zienkiewicz, O. C. and Taylor, R. L. *The Finite Element Method: The Basis*. Butterworth-Heinemann, 2000.
3. Smith, G. D. *Numerical solution of Partial Differential Equations: Finite difference methods*. Oxford Applied Mathematics and Computing Science Series, 1985.
4. Hughes, T. J. R. *The Finite Element Method (Linear Static and Dynamic Finite Element Analysis)*. Courier Corporation, 2007.

## ALGEBRA -II

## (SPMMAT 01 03 03 DCEC 3104)

### UNIT-I

Field, structure of finite fields, finite, algebraic, and transcendental extensions, splitting fields, simple and normal extensions, perfect fields, primitive elements, algebraically closed fields.

### UNIT – II

Automorphisms of extensions. Galois extensions, fundamental theorem of Galois theory, solution of polynomials by radicals, Galois group over the rationals.

### UNIT-III

Vector spaces, modules, direct products and direct sums, quotients and monomorphisms of modules, modules over PIDs and applications, various canonical forms.

### UNIT-IV

Simple and semisimple modules, semisimple rings, Wedderburn-Artin structure theory.

***Suggested Readings:***

1. Herstein, I. N. *Topics in Algebra*. Wiley Eastern Ltd., New Delhi, 2006.
2. Bhattacharya, P. B. Jain, S. K. and Nagpaul, S. R. *Basic Abstract Algebra, 2nd edition.* Cambridge University Press, 1997.
3. Cohn, P. M. *Algebra*. John Wiley & Sons, Vols. I: 1982, Vols. II: 1989, Vols. III: 1991.
4. Anderson, F. W. and Fuller, K. R. *Rings and Categories of Modules*. Springer-Verlag New York, 1992.
5. Dummit, D.S. and Foote, R.M. *Abstract Algebra (3rd revised edition).* Wiley, 2003.
6. Lang, S. *Algebra*. Springer, 2012.

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## FLUID DYNAMICS

## (SPMMAT 01 03 04 DCEC 3104)

### UNIT I

Concept of fluids, physical properties of fluids, continuum hypothesis, density, specific weight, specific volume, kinematics of fluids, Eulerian and Lagrangian methods of description of flows, equivalence of Eulerian and Lagrangian method, general motion of fluid element, integrability and compatibility conditions, strain rate tensor, streamline, path line, streak lines, stream function, vortex lines, circulation.

### UNIT II

Stresses in Fluids: stress tensor, symmetry of stress tensor, transformation of stress components from one co-ordinate system to another, principle axes and principle values of stress tensor conservation laws: equation of conservation of mass (continuity equation), equation of conservation of momentum, Navier Stokes equation, Euler's equation of motion, equation of moments of momentum, equation of energy.

### UNIT III

Irrotational and rotational flows : Bernoulli's equation, Bernoulli's equation for irrotational flows, two dimensional irrotational incompressible flows, circle theorem, sources and sinks, sources sinks and doublets in two dimensional flows, methods of images.

### UNIT IV

Approximate (analytical) solutions of Navier Stoke equation, order of magnitude analysis, use of similarity variables in analytical solution techniques, solutions of some benchmark problems like; Couette flow, axi-symmetric flows, creeping flows.

***Suggested Readings:***


1. O'Neil, M. E., and Chorlton, F. *Ideal and Incompressible Fluid Dynamics*. John Wiley & Sons, 1986.
2. Kundu, P. K., Cohen, I. M. and Dowling, R. David. *Fluid Mechanics*, 6th edition, Academic Press, 2015.
3. Yuan, S. W. *Foundations of Fluid Mechanics*. Prentice Hall of India Private Limited, New Delhi, 1976.
4. Besaint, W.H. and Ramsey, A. S. *A Treatise on Hydromechanics, Part II*. CBS Publishers, Delhi, 1988.
5. Curle, N. and Davies, H. J. *Modern Fluid Dynamics*. Vol 1, D Van Nostrand Company Ltd, London, 1968.

## FUZZY SET THEORY

## (SPMMAT 01 03 05 DCEC 3104)

### UNIT-I

Concepts of fuzzy set, standard operations of fuzzy set, fuzzy complement, fuzzy union, fuzzy intersection, other operations in fuzzy set, t- norms and t- conorms. interval, fuzzy number, operation of interval, operation of - cut interval, examples of fuzzy number operation.

### UNIT-II

Definition of triangular fuzzy number, operation of triangular fuzzy number, operation of general fuzzy numbers, approximation of triangular fuzzy number, operations of trapezoidal fuzzy number, bell shape fuzzy number, function with fuzzy constraint, propagation of fuzziness by crisp function, fuzzifying function of crisp variable, maximizing and minimizing set, maximum value of crisp function.

### UNIT-III

Integration and differentiation of fuzzy function product set, definition of relation, characteristics of relation, representation methods of relations, operations on relations, path and connectivity in graph, fundamental properties, equivalence relation, compatibility relation, pre-order relation, order relation, definition and examples of fuzzy relation, fuzzy matrix, operations on fuzzy relation.

### UNIT-IV

Composition of fuzzy relation, - cut of fuzzy relation, projection and cylindrical extension, extension by relation, extension principle, extension by fuzzy relation, fuzzy distance between fuzzy sets, graph and fuzzy graph, fuzzy graph and fuzzy relation, - cut of fuzzy graph.

***Suggested Readings:***

1. Lee, K. H. *First Course on Fuzzy Theory and Applications*. Springer International Edition, 2005.
2. Mohan, C. *An Introduction to Fuzzy Set Theory and Fuzzy Logic*. Anshan Publishers, 2015.
3. Zimmerman, H. J. *Fuzzy Set Theory and its Applications*. Allied Publishers Ltd., New Delhi, 1991.
4. Yen, J., Langari, R. *Fuzzy Logic - Intelligence, Control and Information*. Pearson Education, 1999.

## PROGRAMMING IN MATLAB

**(SPMMAT 01 03 06 DCEC 2124)**

### Unit-I

Overview of MATLAB, operators, display format, elementary built-in functions, working with variables, general commands, data types, data import, arrays, operations with arrays.

### Unit-II

Matrices: eigenvalues and eigenvectors, similarity transformation and diagonalization, functions, script files, operators, loops and conditional statements, programming in MATLAB, graphics- 2-D and 3-D plots, input and output.

### Unit-III

Applications in numerical methods: bisection method, false position (Regula-Falsi) method, Newton–Raphson) method
System of linear equations, LU decomposition, Gauss elimination method, Gauss Seidel method, Gauss Jordan method, interpolation, Lagrange and Newton polynomials.

### Unit-IV

Applications to numerical differentiation and integrations: Trapezoidal method and Simpson method, Runge–Kutta method, introduction to working with modules in MATLAB.

***Suggested Readings:***

1. Otto, S.R. and Denier, J.P. *An Introduction to Programming and Numerical Methods in MATLAB*. Springer-Verlag, 2005.
2. Pratap, R. *Getting Started with MATLAB: A Quick Introduction for Scientists and Engineers*. Oxford University Press, 2016.
3. Yang, W. Y., Cao, W., Chung, T. and Morris, J. *Applied Numerical Methods using MATLAB*. John Wiley Interscience, 2005.
4. Kumar, S. S. and Lenina, S. V. B. *Matlab: Easy Way of Learning*. PHI Learning Pvt. Ltd., 2016.
5. Chapman, S. J. Matlab Programming for Engineers, 5th edition, Cengage Learning, 2015.
6. *Getting Started with MATLAB*, Maths Works Inc. *www. in.mathsworks.com*.

# SEMESTER – IV

## DCEC COURSES OFFRED TO M.SC. (MATHEMATICS) STUDENTS ONLY

### DIFFERENTIAL GEOMETRY

### (SPMMAT 01 04 01 DCEC 3104)

### UNIT-I

Curves with torsion: tangent, principal normal, curvature, binormal, torsion, Serret-Frenet formulae, locus of centre of spherical curvature, helix, involutes and evolutes.

### UNIT-II

Envelopes: surfaces, tangent plane, envelope, characteristics, edge of regression, developable surfaces, osculating, polar and rectifying developable.

### UNIT-III

Curvilinear co-ordinates: first order magnitude, directions on a surface, second order magnitudes, derivative of unit normal, principal directions and curvatures.

### UNIT-IV

Geodesics: geodesic property, equations of geodesics, torsion of a geodesic. Bonnet's theorem, Joachimsthal's theorems, geodesic parallels, geodesic ellipses and hyperbolas, Liouville surfaces.

***Suggested Readings:***

1. Weatherburn, C. E. *Differential Geometry of Three Dimensions*, Cambridge University Press, 2016.
2. Wilmore T. J. *An Introduction to Differential Geometry*, Dover Publications Inc., 2012.
3. Graustein, W. C. *Differential Geometry*. Courier Corporation, 2012.
4. Pressley, A. *Elementary Differential Geometry*. Springer, 2002.

## MATHEMATICAL MODELING

**(SPMMAT 01 04 02 DCEC 3104)**

### Unit-I

Simple situations requiring mathematical modelling, techniques of mathematical modelling, classifications, characteristics and limitations of mathematical models, some simple illustrations, mathematical modelling in population dynamics, mathematical modelling of epidemics through systems of ordinary differential equations of first order mathematical models in medicine, battles and international trade in terms of systems of ordinary differential equations.

### Unit-II

The need for mathematical modelling through difference equations, linear growth and decay models, non-linear growth and decay models, basic theory of linear difference equations with constant coefficients, mathematical modelling through difference equations in economics and finance.

### Unit-III

Mathematical modelling through difference equations in population dynamics and genetics, mathematical modelling through difference equations in probability theory, miscellaneous examples of mathematical modelling through difference equations.

### Unit-IV

Situations that can be modelled through graphs, mathematical models in terms of directed graphs mathematical models in terms of signed graphs, mathematical models in terms of weighted graphs.

***Suggested Readings:***

1. Kapur J. N. *Mathematical Modelling*, New Age International, 1988.
2. Rutherford, A. *Mathematical Modelling Techniques.* Courier Corporation, 2012.
3. Bender, E. A. *An Introduction to Mathematical Modelling.* Courier Corporation, 2000.
4. Clive, L. D. *Principles of Mathematical Modelling*. Elsevier, 2004.
5. Meerschaert, M. M. *Mathematical Modelling*. Academic Press, 2013.

## ADVANCED NUMERICAL ANALYSIS

## (SPMMAT 01 04 03 DCEC 3104)

### UNIT-I

General iterative method for the system: x = g(x) and its sufficient condition for convergence. Chebyshev method, Newton-Raphson method. Successive over relaxation (SOR) method for system of linear equations. Bivariate interpolation, B-Spline interpolation and Bezier curves.

### UNIT-II

Review of finite difference operators, difference equations, order of difference equation, degree of difference equation, solution of difference equations, use of generating function in the solution of difference equation. Givens and Householder methods real symmetric matrix

### Unit III

Numerical solutions of parabolic equations of second order in one space variable –two and three levels explicit and implicit difference schemes, truncation errors and stability. Numerical solution of parabolic equations of second order in two space variable -improved explicit schemes, implicit methods, alternating direction implicit (ADI) methods.

### Unit IV

Numerical solution of hyperbolic equations of second order in one and two space variables with constant and variable coefficients-explicit and implicit methods. ADI methods. Numerical solutions of elliptic equations-approximations of Laplace and biharmonic operators, solutions of Dirichlet, Neumann and mixed type problems with Laplace and Poisson equations in rectangular, circular and triangular regions. ADI methods.

***Suggested Readings:***

1. Atkinson, K. and Han, W. *Theoretical Numerical Analysis*, Springer Science & Business Media, 2010.
2. Smith, G. D. *Numerical solution of Partial Differential Equations: Finite Difference Methods*. 3rd edition. Oxford University Press, 1985.
3. Bradie, B. *A friendly introduction to Numerical Analysis*. Pearson Education, 2007.
4. Bazaraa, M.S., Sherali, H.D. and Shetty, C.M. *Nonlinear Programming Theory and Algorithms*. John Wiley and Sons, 2004.
5. Gupta. R. S., *Elements of Numerical Analysis*, 2nd Edition, Cambridge University Press, 2015

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## THEORY OF ELASTICITY

## (SPMMAT 01 04 04 DCEC 3104)

### UNIT-I

Cartesian tensor: Coordinate transformation, Cartesian tensor of different order, sum or difference and product of two tensors. contraction theorem, quotient law, symmetric & skew symmetric tensors, Kronecker tensor, alternate tensor and relation between them, scalar invariant of second order tensor, eigen values & vectors of a symmetric second order tensor, gradient, divergence & curl of a tensor field.
Analysis of strain: affine transformations, infinitesimal affine transformation, geometrical interpretation of the components of strain.

### UNIT-II

Strain quadric of Cauchy, principal strains and invariants, general infinitesimal deformation. Saint-Venant's equations of compatibility.
Analysis of stress: stress tensor, equations of equilibrium, transformation of co-ordinates, stress quadric of Cauchy, principal stress and invariants, maximum normal and shear stresses.

### UNIT-III

Equations of elasticity: Generalized Hooke's law, homogeneous isotropic media, elastic moduli for isotropic media, equilibrium and dynamic equations for an isotropic elastic solid, strain energy function and its connection with Hooke's law, Beltrami-Michell compatibility equations.

### UNIT- IV

Two-dimensional problems: Plane strain, plane stress, generalized plane stress, Airy's stress function, general solution of bi-harmonic equation, stresses and displacements in terms of complex potentials, propagation of waves in an isotropic elastic solid medium, waves of dilation and distortion, elastic surface waves such as Rayleigh and Love waves.

***Suggested Readings:***


1. Sadd, M. H. *Elasticity: Theory, Applications and Numerics*. Academic Press, 2014.
2. Sokolnikoff, I.S. *Mathematical Theory of Elasticity*. McGraw-Hill Inc, 2nd revised edition, 1956.
3. Narayan, S. *Text Book of Cartesian Tensors*. S. Chand & Co., 1968.
4. Timoshenko, S. P. and Goodier, J. N. *Theory of Elasticity*. New York McGraw-Hill, 2010.
5. Love, A. E. H. *A Treatise on Mathematical Theory of Elasticity*. Cambridge [Eng.] University Press, 2013.

## ADVANCED COMPLEX ANALYSIS

## (SPMMAT 01 04 05 DCEC 3104)

### UNIT-I

Maximum modulus principle, Schwarz's lemma, convex functions and Hadamard's three circles theorem, Phragmen-Lindelof theorem.

### UNIT-II

The space of continuous functions, spaces of analytic functions, The Riemann mapping theorem, Weierstrass factorization theorem. Gamma function, Reimann zeta function

### UNIT-III

Analytic continuation, Runge's theorem, simple connectedness, Mittag-Leffler's theorem, Schwarz reflection principle, analytic continuation.

### UNIT-IV

Basic properties of harmonic functions, harmonic functions on a disk, Jensen's formula, Bloch's theorem, The Little Picard theorem, Schottky's theorem, The Great Picard theorem.

***Suggested Readings:***

1. Lang, S. *Complex Variable.* Springer, 2013.
2. Alpay, D. *A Complex Analysis Problem Book.* Birkhäuser, 2016.
3. Churchill, R. V. and Brown, J. W. *Complex Variables and Applications. 9th edition,* McGraw Hill Education, 2014.
4. Conway J. B. *Functions of One Complex Variable.* Springer, 1978.
5. Ahlfors, L.V. *Complex Analysis*. McGraw-Hill, 1979
6. Edward, S. B. and Snider, Arthur D. *Fundamental of Complex Analysis with Applications to Engineering and Sciences*. Pearson Education, 2014.

## INTRODUCTION TO CRYPTOGRAPHY

**(SPMMAT 01 04 06 DCEC 3104)**

### UNIT-I

Modular arithmetic, congruence, primitive roots, cryptography introduction, Caesar Cipher, Diffie-Hellman RSA public key cryptosystem, Knapsack cryptosystem, application of primitive roots to cryptography.

### UNIT-II

Applications of cryptography in primality testing and factorization of large composite numbers, remote coin flipping. elliptic curve based cryptography.

### UNIT-III

Perfect numbers, Fermat numbers, Mersenne primes and amicable numbers, Fibonacci numbers, representation of integers as sum of Squares.

### UNIT-IV

Linear and non-linear Diophantine equations, Fermat's last theorem, prime number theorem and zeta function.

***Suggested Readings:***

1. Burton , D. M. *Elementary Number Theory*, Tata McGraw Hill Publishing House, 2006.
2. Menezes, A. J., V., Oorschot, P. C. and Vanstone, S. A. *Handbook of Applied Cryptography*. CRC Press, 1996.
3. Koblitz, N. *A Course in Number Theory and Cryptography*. Springer, 1987.
4. Buchmann, J. A. *Introduction to Cryptology*. Springer Science & Business Media, 2012
5. Simmons, G. J. *Contemporary Cryptology, The Science of Information Integrity*. New York, IEEE Press, 1992
6. Tilborg, H. C. A. *Fundamentals of Cryptology*. Springer, 2013.

## ADVANCED ABSTRACT ALGEBRA

## (SPMMAT 01 04 07 DCEC 3104)

### UNIT – I

Cyclic modules, simple and semi-simple modules, Schur's lemma, free modules, fundamental structure theorem of finitely generated modules over principal ideal domain and its applications to finitely generated abelian groups.

### UNIT – II

Uniform modules, primary modules and Noether- Lasker theorem, Noetherian and Artinian modules and rings with simple properties and examples.

### UNIT – III

Nilpotent ideals in Noetherian and Artinian rings, Hilbert basis theorem, Nakayama's lemma, Nilradical and Jacobson radicals, operations on ideals, extension and contraction.

### UNIT – IV

Hom(R,R), opposite rings, Wedderburn - Artin theorem, Maschk's theorem, equivalent statement for left Artinian rings having non-zero nilpotent ideals.

***Suggested Readings:***

1. Rotman, J. J. *Advanced Modern Algebra. 3rd edition.* American Mathematical Soc., 2015.
2. Bhattacharya, P. B., Jain, S. K. and Nagpaul, S. R. *Basic Abstract Algebra.* 2nd edition, Cambridge University Press, Indian edition, 1997.
3. Atiyah, M. F. and Macdonald, I. G. *Introduction to Commutative Rings.* Sarat Book House, 2007.
4. Cohn, P. M. *Algebra, Vols. I, II & III*, John Wiley & Sons, (Vol. I-1982, Vol. II- 1989, Vol-III- 1991).
5. Curtis, C. W. and Reiner, I. *Representation Theory of finite Groups and Associative Algebras.* Wiley, 1988.
6. Anderson, F. W. and Fuller, K. R. *Rings and Categories of Modules.* Springer-Verlag New York, 1992.
7. Lam, T. Y. *Lectures on Modules and Rings.* GTM Vol. 189, Springer-Verlag, 1999.

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## MEASURE THEORY AND INTEGRATION

### (SPMMAT 01 04 08 DCEC 3104)

### UNIT – I

Length of an open set, concept of measure, Lebesgue outer measure and measurable sets, example of non-measurable set, Sigma algebra, Borel sets, $G_\delta$ and $F_\sigma$ –sets, Outer and inner regularity of Lebesgue measure.

### UNIT - II

Set function, abstract measure spaces, properties of measures, some examples of measures, measurable spaces, measurable functions, combinations of measurable functions, and limits of measurable functions.

### UNIT- III

Review of Riemann integral, integrable simple functions, the Lebesgue integration of a measurable function, integration with respect to a measure.

### UNIT - I V

Almost everywhere convergence, convergence in measure, Fatou's Lemma, monotone and dominated convergence theorems.

***Suggested Readings:***


1. Barra, G. de. *Measure Theory and Integration*. New Age International (P) Ltd., 2009.
2. Berberian, S. K. *Measure and Integration*. AMS Chelsea Publications, 2011.
3. Royden, H. L. and Fitzpatrick P. M. *Real Analysis*. 4th edition, Pearson India, 2010.
4. Rana, I. K. *An Introduction to Measure and Integration*. 2nd edition, Narosa Publishing House, 2004.
5. Hewitt, E. and Stromberg, K. *Real and Abstract Analysis*. Springer-Verlag, New York, 1975.
6. Folland, G. B. *Real Analysis*. John Wiley & Sons, Inc., New York, 1999.

## FUNCTIONAL ANALYSIS

## (SPMMAT 01 04 09 DCEC 3104)

### UNIT-I

Metric Space, sequences, Cauchy sequences, complete metric spaces and examples, Baire's theorem. Cantor intersection theorem and Banach fixed point principle, normed linear spaces. Banach spaces, examples of Banach spaces and subspaces.

### UNIT-II

Continuity of linear maps, Equivalent norms, normed spaces of bounded linear maps, bounded linear functionals, dual spaces of $l^p$, $\mathbb{R}^n$and reflexivity, Hilbert spaces and examples, orthogonality, orthonormal sets, Bessel's inequality, Parsevals's theorem, the conjugate space of a Hilbert space.

### UNIT-III

Representation of bounded functional on Hilbert space, adjoint operators, self-adjoint operators, normal and unitary operators, weak and strong convergence, completely continuous operators.

### UNIT-IV

Hahn-Banach theorem and its applications, uniform boundedness principle, open mapping theorem, projections on Banach spaces, closed graph theorem.

***Suggested Readings:***

1. Kreyszig, E. *Introductory Functional Analysis with Applications*. John Wiley, 2007.
2. Simmons, G. F. *Introduction to Topology and Modern Analysis*. McGraw-Hill Pvt. Ltd. 2016.
3. Bachman, G. and Narici, L. *Functional Analysis*. Courier Corporation, 2012.
4. Royden, H. L. *Real Analysis*. MacMillan Publishing Co., Inc., New York, 4th edition, 1993.
5. Conway, J. B. *A course in functional analysis*. Springer, 2010.

## SKILL ENHANCEMENT ELECTIVCE COURSES

**Department may also offer skill enhancement courses besides the following two courses depending on the availability and expertise of the faculty members in the Department.**

### PROGRAMMING IN MATLAB

### (SPMMAT 01 04 01 SEEC 0120)

#### UNIT-I

Overview of MATLAB, operators, display format, elementary built-in functions, working with variables, General commands, data types, data import, arrays, operations with arrays.

#### UNIT-II

Matrices: eigenvalues and eigenvectors, similarity Transformation and diagonalization, functions, script files, operators, loops and conditional statements, programming in MATLAB, graphics- 2-D and 3-D plots, input and output.

#### UNIT-III

Applications in numerical methods: system of linear equations, LU decomposition, Gauss elimination method, Gauss Seidel method, Gauss Jordan method, interpolation, Lagrange and Newton polynomials, curve fitting, bisection method, false position (Regula-Falsi) method, Newton–Raphson) method, secant method, Newton method for a System of nonlinear equations, symbolic solution for equations.

#### UNIT-IV

Applications to numerical differentiation and integrations: Trapezoidal method and Simpson method, Runge–Kutta method, introduction to working with modules in MATLAB.

***Suggested Readings*:**

1. Yang, W. Y., Cao, W., Chung, T. S. and Morris, J. *Applied Numerical Methods using MATLAB*. John Wiley & Sons, 2007.
2. Otto, S. R. and Denier, J. P. *An Introduction to Programming and Numerical Methods in MATLAB*. Springer Science & Business Media, 2005
3. Rudra P. *Getting Started with MATLAB: A Quick Introduction for Scientists and Engineers*, Oxford University Press, 2002.
4. Chapman, S. J. Matlab Programming for Engineers, 5th edition Cengage Learning, 2015.
5. Getting started with Matlab, Maths Works Inc. www. in.mathsworks.com

## TYPESETTING IN LATEX

## (SPMMAT 01 04 02 SEEC 0120)

### UNIT I

Preparing an input file, sentences and paragraphs, the document class, sectioning, display material, running LaTeX, changing the type style, producing mathematical symbols and mathematical formulae, arrays, delimiters, multiline formulae, putting one thing on other, spacing in math mode.

### UNIT II

Defining command and environments, Producing and including graphics in a LaTeX file, figures and other floating bodies, lining it up in columns, table of content, cross-reference, bibliography and citation, making index and glossary, slides, overlays and notes, letters.

### UNIT III

Design it yourself: document class, page style, title page, customizing the style, line and page breaking, numbering, length, spaces and boxes, formatting with boxes, centring and flushing, list making environments, changing font type size and special symbols, picture, picture environments, picture objects, text, boxes, straight lines, arrow, stacks, circles, oval, framing, curve, grid, repeat patterns.

### UNIT IV

Making presentation slides in beamer class LaTeX, various styles in beamer presentation, dynamic slides. PostScript macros for Generic TeX (PsTrix): arguments, dimension, coordinates, angles, line styles, fill styles, custom styles, custom graphics, picture tools, text tricks, node and connection special tricks. Basics of MathJax, Mathjax configuration options.

***Suggested Readings*:**

1. Leslie L. *A Document Preparation System: User's Guide and Reference Manual*. Addison-Wesley Publishing Company, 2001.
2. Stefan K. *LaTeX Beginner's Guide*, Packt Publishing Ltd, 2011
3. Tantau, T. *User Guide to the Beamer Class*, http://latex-beamer.sourceforge.net.
4. Tobias O. *The Not So Short Introduction to LATEX2E*. https://tobi.oetiker.ch/lshort/lshort.pdf

CENTRAL UNIVERSITY OF HARYANA, MAHENDERGARH

SCHOOL OF ENGINEERING AND TECHNOLOGY

Proceedings / Minutes of the Meeting
of School Board Held on 13.02.2019

The meeting of the School Board of School of Engineering and Technology was held on 13.02.2019. The following were present

1. Dr. Ajay Kumar Bansal, Dean, SOET- Chairman
2. Prof. D. V. S. Verma (Retd.), NIT, Kurukshetra- Member
3. Prof. Anjan Kumar Baral, Professor, GJUST, Hisar- Member
4. Dr. Vikas Garg,HOD, Civil Engg.- Member
5. Dr. Rajesh Kumar Dubey, Associate Professor, CUH- Member
6. Dr. Munish Manas, Assistant Professor, CUH- Member
7. Ms. Ekta Kumari, Assistant Professor, CUH- Member
8. Mr. Deepak Rana, Assistant Professor, CUH- Member
9. Mr. Tarun Singh, Assistant Professor, CUH- Member
10. Dr. Phool Singh, Associate Professor, CUH- Special Invitee
11. Dr. Kalpana Chauhan, Associate Professor, CUH- Special Invitee

Prof. B. R. Chahar, Dr. J. S. Saini and Dr. N. K. Jain, Subject Expert- Member could not attend the meeting due to prior engagements.

After deliberations, it was resolved/ recommended by the School Board as follows:

1. The Scheme of Studies & Examinations and the Syllabi of B.Tech. (Electrical Engg.)- II year (3rd and 4th semesters) approved by BOS, Electrical Engineering were discussed and approved for the Batch 2018-19 onwards (Annexure-1).

2. The Scheme of Studies & Examinations and the Syllabi of B.Tech. (Civil Engg.)- II year (3rd and 4th semesters) approved by BOS, Civil Engineering were discussed and approved for the Batch 2018-19 onwards (Annexure-2).

3. The Scheme of Studies & Examinations and the Syllabi of B.Tech. (Printing and Packaging Technology)- II year (3rd and 4th semesters) approved by BOS, PPT were discussed and approved for the Batch 2018-19 onwards (Annexure-3).

4. The Scheme of Studies & Examinations and the Syllabi of B.Tech. (Computer Science Engg.)- II year (3rd and 4th semesters) approved by BOS, Computer Science Engineering (Through mail) were discussed and approved for the Batch 2018-19 onwards (Annexure-4).

5. The Scheme of Studies & Examinations and the Syllabi of B.Tech. (common for All branches)- I year (1st and 2nd semesters) approved by various BOS were discussed and approved for the Batch 2019-20 onwards (Annexure-5).

The meeting ended with vote of thanks to the Chair.

13/02/2019

Mr. Tarun Singh

13.02.19

Ms. Ekta Kumari

Mr. Deepak Rana

Dr. Kalpana Chauhan

13/02/19

Dr. Munish Manga

Dr. Phool Singh

Dr. Rajesh Kumar Dubey

13/2/19

Dr. Vikas Garg

13-02-19

Dr. A. K. Baral

13/2/19

Prof. D. V. S. Verma

13/2/19

Dr. Ajay Kumar Bansal

# Scheme & Syllabus for B.Tech (1st Year) according to Choice Based Credit System (CBCS)

## (Semester I and Semester II)

## For all branches
## For Session 2019-20 onwards
## (4th batch onward)

## School of Engineering & Technology

## CENTRAL UNIVERSITY OF HARYANA
## MAHENDERGARH-123031
## HARYANA

Central University of Haryana, Mahendergarh

B.Tech. 1ST YEAR (SEMESTER – I) (Common for all branches)

| S. No. | Course Code | Course Title | Teaching Schedule L | T | P | Marks of Class work | Examination Marks Theory | Practical | Total Marks | Credits | Duration of Exam |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | BT HUM 101B | ENGLISH LANGUAGE SKILLS (Gr.-A) | 2 | 0 | 0 | 30 | 70 | 0 | 100 | 2 | 3 |
| 2 | | MATHEMATICS-I | 3 | 1 | | 30 | 70 | 0 | 100 | 4 | 3 |
| 3 | BT CH 102A | PHYSICS (Gr.-A) OR CHEMISTRY (Gr.-B) | 3 | 1 | | 30 | 70 | 0 | 100 | 4 | 3 |
| 4 | BT EE 103A | BASIC ELECTRICAL ENGINEERING (Gr.-A) | 3 | 1 | | 30 | 70 | 0 | 100 | 4 | 3 |
| | BT CSE104A | OR PROGRAMMING FOR PROBLEM SOLVING (Gr.-B) | 3 | 0 | | 30 | 70 | 0 | 100 | 3 | |
| 5 | BT ME 105A | ENGINEERING GRAPHICS & DESIGN (Gr.-A) OR | 1 | 0 | 4 | 30 | 0 | 70 | 100 | 3 | 3 |
| | BT ME106A | WORKSHOP/ MANUFACTURING PRACTICES (Gr.-B) | | | | | | | | | |
| 6 | BT HUM107B | ENGLISH LANGUAGE LAB (Gr.-A) | 0 | 0 | 2 | 30 | 0 | 70 | 100 | 1 | 3 |
| 7 | BT CH108A | PHYSICS LAB (Gr.-A) OR CHEMISTRY LAB (Gr.-B) | 0 | 0 | 3 | 30 | | 70 | 100 | 1.5 | 3 |
| 8 | BT EE 109B | BASIC ELECTRICAL ENGINEERING LAB(Gr.-A)/ OR | 0 | 0 | 2 | 30 | | 70 | 100 | 1 | 3 |
| | BT CSE 110A | PROGRAMMING FOR PROBLEM SOLVING LAB (Gr.-B) | 0 | 0 | 4 | 30 | | 70 | 100 | 2 | |
| Total | | Gr.-A | 12 | 3 | 10 | 240 | 280 | 280 | 800 | 20.5 | |
| | | Gr.-B | 10 | 2 | 10 | 180 | 210 | 210 | 600 | 17.5 | |

## MATHEMATICS AND PHYSICS COURSES FOR DIFFERENT BRANCHES

| COURSE CODE | COURSE TITLE |
|---|---|
| MATHEMATICS -I | |
| BT MAT 111B | MATHEMATICS –I (For computer Science &Engg) |
| BT MAT 112B | MATHEMATICS –I ( common for all branches except CSE) |
| PHYSICS and PHYSICS LAB (Any One Combination) | |
| BT PHY 113A<br>BT PHY 114A | MECHANICS<br>MECHANICS LAB (For CE) |
| BT PHY 115A<br>BT PHY 116A | WAVES, OPTICS AND QUANTUM MECHANICS<br>WAVES, OPTICS AND QUANTUM MECHANICS LAB (For CE&PPT) |
| BT PHY 117A<br>BT PHY 118A | SEMICONDUCTOR PHYSICS<br>SEMICONDUCTOR PHYSICS LAB (For CSE) |

**Note:**

1. Every student has to participate in the MANDATORY INDUCTION PROGRAM OF THREE WEEK DURATION at the start of regular teaching of first semester. It comprises physical activity, creative Arts, Universal Human Values, Literary, Proficiency Modules, Lectures by Eminent People, Visits to local Areas, Familiarization to Dept/ Branch & Innovations.
2. All the branches are to be divided into groups 'A' and 'B' as per the suitability of the institute/college, so that there is an equitable distribution of teaching load in odd and even semesters.

For CUH, Mahendergarh: GROUP (Gr.) A: CSE, CE. GROUP (Gr.) B: EE, PPT.

## Central University of Haryana, Mahendergarh

## B.Tech. I[st] YEAR (SEMESTER – II[nd]) (Common for all branches)

| S. No. | Course Code | Course Title | Teaching Schedule L | T | P | Marks of Class work | Examination Marks Theory | Practical | Total Marks | Credits | Duration of Exam |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | BT HUM 101B | ENGLISH LANGUAGE SKILLS (Gr.-B) | 2 | 0 | 0 | 30 | 70 | 0 | 100 | 2 | 3 |
| 2 | | MATHEMATICS-II | 3 | 1 | | 30 | 70 | 0 | 100 | 4 | 3 |
| 3 | BT CH102A | PHYSICS (Gr.-B) OR CHEMISTRY (Gr.-A) | 3 | 1 | | 30 | 70 | 0 | 100 | 4 | 3 |
| 4 | BT EE 103A | BASIC ELECTRICAL ENGINEERING (Gr.-B) | 3 | 1 | | 30 | 70 | 0 | 100 | 4 | 3 |
| | BT CSE104A | OR PROGRAMMING FOR PROBLEM SOLVING (Gr.-A) | 3 | 0 | | 30 | 70 | 0 | 100 | 3 | |
| 5 | BT ME 105A | ENGINEERING GRAPHICS & DESIGN (Gr.-B) | 1 | 0 | 4 | 30 | 0 | 70 | 100 | 3 | 3 |
| | BT ME 106A | OR WORKSHOP/ MANUFACTURING PRACTICES (Gr.-A) | | | | | | | | | |
| 6 | BT HUM 107B | ENGLISH LANGUAGE LAB (Gr.-B) | 0 | 0 | 2 | 30 | 0 | 70 | 100 | 1 | 3 |
| 7 | BT CH 108A | PHYSICS LAB (Gr.-B) OR CHEMISTRY LAB (Gr.-A) | 0 | 0 | 3 | 30 | | 70 | 100 | 1.5 | 3 |
| 8 | BT EE109B | BASIC ELECTRICAL ENGINEERING LAB Gr.-B) | 0 | 0 | 2 | 30 | | 70 | 100 | 1 | 3 |
| | BT CSE 110A | OR PROGRAMMING FOR PROBLEM SOLVING LAB (Gr.-A) | 0 | 0 | 4 | 30 | | 70 | 100 | 2 | |
| | | Total Gr.-B | 12 | 3 | 10 | 240 | 280 | 280 | 800 | 20.5 | |
| | | Gr.-A | 10 | 2 | 10 | 180 | 210 | 210 | 600 | 17.5 | |

## MATHEMATICS AND PHYSICS COURSES FOR DIFFERENT BRANCHES

| COURSE CODE | COURSE TITLE |
|---|---|
| **MATHEMATICS -II** | |
| BT MAT 119B | MATHEMATICS –II (For computer Science &Engg) |
| BT MAT120B | MATHEMATICS –II ( common for all branches except CSE) |
| **PHYSICS and PHYSICS LAB (Any One Combination)** | |
| BT PHY 113A<br>BT PHY 114A | MECHANICS<br>MECHANICS LAB (For CE) |
| BT PHY 115A<br>BT PHY 116A | WAVES, OPTICS AND QUANTUM MECHANICS<br>WAVES ,OPTICS AND QUANTUM MECHANICS LAB (For EE&PPT) |
| BT PHY 117A<br>BT PHY 118A | SEMICONDUCTOR PHYSICS<br>SEMICONDUCTOR PHYSICS LAB (For CSE) |

**Note:**

1. All the branches are to be divided into groups 'A' and 'B' as per the suitability of the institute/college, so that there is an equitable distribution of teaching load in odd and even semesters.
2. For CUH, Mahendergarh: GROUP (Gr.) A: CSE, CE. GROUP (Gr.) B: EE, PPT.

## B. Tech. (Semester – I) Physics
## (For Group-A at CUH, Mahendergarh)

| Course Code | Branch Name | Course Title | Teaching Schedule | | | Marks of Class Work | Examination Marks | | Total | Credits | Duration of Exam |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | L | T | P | | Theory | Practical | | | |
| BT PHY 117A | CSE | Semiconductor Physics | 3 | 1 | - | 30 | 70 | - | 100 | 4 | 3 |
| BT PHY 113A | CE | Mechanics | 3 | 1 | - | 30 | 70 | - | 100 | 4 | 3 |

## B. Tech. (Semester – II) Physics

## (For Group-B at CUH, Mahendergarh)

| Course Code | Branch Name | Course Title | Teaching Schedule | | | Marks of Class Work | Examination Marks | | Total | Credits | Duration of Exam |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | L | T | P | | Theory | Practical | | | |
| BT PHY 115A | EE & PPT | Waves, Optics & Quantum Mechanics | 3 | 1 | - | 30 | 70 | - | 100 | 4 | 3 |

## B. Tech. (Semester – I) Physics Lab

## (For Group-A at CUH, Mahendergarh)

| Course Code | Branch Name | Course Title | Teaching Schedule | | | Marks of Class Work | Examination Marks | | Total | Credits | Duration of Exam |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | L | T | P | | Theory | Practical | | | |
| BT PHY 118A | CSE | Semiconductor Physics Lab | 0 | 0 | 3 | 30 | 0 | 70 | 100 | 1.5 | 3 |
| BT PHY 114A | CE | Mechanics Lab | 0 | 0 | 3 | 30 | - | 70 | 100 | 1.5 | 3 |

## B. Tech. (Semester – II) Physics Lab

## (For Group-B at CUH, Mahendergarh)

| Course Code | Branch Name | Course Title | Teaching Schedule | | | Marks of Class Work | Examination Marks | | Total | Credits | Duration of Exam |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | L | T | P | | Theory | Practical | | | |
| BT PHY 116A | EE & PPT | Wave, Optics & Quantum Mechanics Lab | 0 | 0 | 3 | 30 | - | 70 | 100 | 1.5 | 3 |

## B.Tech. Semester I/II (Common for All Branches)

**Course Title: English Language Skills**

**Course Code: BT HUM 101B**

**Category : Humanities**

| L | T | P | Credits |
|---|---|---|---|
| 2 | 0 | 0 | 2 |

| | | |
|---|---|---|
| **Class Work** | : | **30 Marks** |
| **Examination** | : | **70 Marks** |
| **Total** | : | **100 Marks** |
| **Duration of Examination** | : | **3 Hours** |

**Course objectives:**

1. To equip students with English Language skills needed in academic and professional world
2. To make students technically proficient in handling language skills required for competitive exams.
3. To inculcate human/ethical values in the students to ensure their holistic development
4. To develop ability to critically read the literary texts

**Course outcomes:**

The students will be able to

1. Acquire basic proficiency in English
2. Develop their verbal ability
3. Enhance their writing, reading and analytical skills
4. Develop proficiency in reading along with sensitivity to the impact literary texts can have on their minds/lives

**Course Contents:**

**Course Contents:**

**Unit I: Basic Writing skills**

(a) Subject Verb Agreement
(b) Vocabulary: Text Completion
(c) Academic Writing: Essay, Paragraph, Notice
(d) Basic Verb Patterns (V, SV, SVO, SVOO, SVC, SVOC, SVOA)

**Unit II: Vocabulary Building**

(a) One-word substitution **(List attached)*
(b) Line Graph & Map Vocabulary
(b) Commonly used Idioms & Phrases * *(List attached)*
(d) Prefix, Suffix and Commonly Confusing words, Analogy

**Unit III: Creating Grammatical Cohesion**

(a) Types of Sentence (on the basis of Structure)
(b) Use of Conditional Sentences
(c) Use of Active and Passive Voice
(d) Redundancy & Parallelism

**Unit IV: Reading and Writing Practices**

(a) Literary Texts:

i. *Hints for Self Culture* by Lala Har Dayal
ii. "Mother Teresa" by Khushwant Singh

(b) Writing official Letters- Issues Concerning Students' academic and social life

(c) Writing Reports, Types of Report, Strategies for Report Writing, Structure of Report, Evaluation and Organization of Data

(d) Negotiation Skills

**Recommended Readings:**


1. *Bhatnagar, Nitin and Mamta Bhatnagar. *Communicative English for Engineers and Professionals*. Pearson Education, 2013.(The soft copy of the book is available in the university library)
2. # Bhatnagar, k. Manmohan.Ed. *The Spectrum of Life: An Anthology of Modern Prose*. Delhi: Macmillan India Ltd., 2006.
3. Sinha, R.P.*Current English Grammar and Usage*. OUP, 2017.
4. Rizvi, M. Ashraf. *Effective Technical Communication*. McGraw Hill Education (India) Pvt. Ltd., 2014.
5. Eastwood, John. *Oxford Guide to English Grammar*. OUP, 2010.
6. Kumar, Sanjay and Pushp Lata. *Communication Skills*. OUP, 2011.
7. Raman, Meenakshi and Sangeeta Sharma.*Communication Skills*.New Delhi:OUP,2011.
8. Hill, L. A. *A Guide to Correct English*. London:OUP,1965.
9. *Oxford Dictionary of English Idioms*. New Delhi: OUP, 2009
10. Vivekananda, Swami. *Karma Yoga*. New Delhi: Sahityashila Prakashan, 2015.
11. Sharma, R.C. and Krishna Mohan. Business Correspondence and Report Writing. New Delhi: TMH. 2016.

.**http://yousigma.com/religionandphilosophy/swamivivekananda/thesecretofwork.pdf


**Note:**

1. The paper setter will set a first compulsory question comprising of 6 to 10 sub parts (short questions), covering the entire syllabus and two questions (with/without parts) from each unit. The examinee will attempt five questions in all, along with the compulsory question (with all it sub parts), selecting one question from each unit. All Questions will carry equal marks i.e. 14 marks each.
2. The use of programmable devices such as programmable calculators etc. is not allowed during the exam. Sharing of materials will not be permitted during examination.

**Course Code:** BT MAT 111B
**Category:** Basic Science Course
**Course Title: Mathematics-I**
**B.Tech. (Computer Science & Engg.) Semester-I**

| L | T | P | |
|---|---|---|---|
| 3 | 1 | 0 | (4 Credits) |

| | |
|---|---|
| Marks for External Exam | : 70 |
| Marks for Internal Exam | : 30 |
| Total | : 100 |
| Duration of Exam | : 3 Hours |

**Course Objectives:**

1. To give adequate exposure of basics of Engineering Mathematics so as to enable them to visualize engineering problems by using Mathematical tools and to support their subsequent engineering studies.
2. To familiarize the students with techniques in basic calculus and linear algebra.
3. To equip the students with standard concepts and tools at an intermediate to advanced level.
4. To know the advanced level of mathematics and applications that they would find useful in their disciplines.
5. Students will demonstrate the ability to apply the techniques of multivariable Calculus to problems in mathematics, the physical sciences, and engineering.

**Unit-I**

Rank of a matrix, elementary transformations, elementary matrices, inverse using elementary transformations, Gauss elimination and Gauss-Jordan elimination, normal form of a matrix, linear dependence and independence of vectors, consistency of linear system of equations, Orthogonal, Symmetric, skew symmetric, Hermitian Matrices, skew Hermitian Matrices, Normal and unitary Matrices and their properties.

**Unit-2**

Eigenvalues and Eigenvectors of a square matrix, properties of eigenvalues, Cayley - Hamilton theorem and its applications, diagonalization of matrices, similar matrices, Inner product spaces, Gram-Schmidt orthogonalization.

**Unit-3**

Taylor's and Maclaurin theorems with remainders; Curvature & Asymptotes (Cartesian and polar form), Evolutes and involutes; Evaluation of definite and improper integrals; Beta and Gamma functions and their properties; Applications of definite integrals to evaluate surface areas and volumes of revolutions.

**Unit-4**

Vector space, linear dependence and independence of vectors, basis, dimension; Linear transformations (maps), range and kernel of a linear map, rank and nullity, Inverse of a linear transformation, rank-nullity theorem, composition of linear Maps, Matrix associated with a linear map.

**Text Books:**

[1] E. Kreyszig, *Advanced Engineering Mathematics*, 10 edition. Hoboken, NJ: Wiley, 2011.

[2] B. Ramana, *Higher Engineering Mathematics*, 1st edition. New Delhi: McGraw Hill Education, 2017.

[3] B. S. Grewal, *Higher Engineering Mathematics 44th Edition*. Khanna Publishers, 2017.

[4] R. K. Jain and S. R. K. Iyengar, *Advanced Engineering Mathematics 4/e )*, Fourth edition edition. Oxford: Narosa Publishing House Pvt. Ltd. - New Delhi, 2012.

**Reference Books:**

[1] J. R. Hass, C. E. Heil, and M. D. Weir. *Thomas' Calculus*, 14 edition. Boston? Pearson, 2017.

[2] P. S. Das and C. Vijayakumari. *Engineering Mathematics*. First edition. Place of publication not identified: Pearson Education, 2017.

[3] J. Bird. *Higher Engineering Mathematics. 7th ed*, 7 edition. Abingdon, Oxon ; New York, NY: Routledge, 2014.

[4] T. Veerarajan. *Engineering Mathematics*. McGraw Hill Education India Pvt Ltd, 2007.

**Course Outcomes:**

1. The students will learn to apply differential and integral calculus to notions of curvature and to improper integrals.
2. They will have a basic understanding of Beta and Gamma functions.
3. They will understand essential tools of matrices and determinant to solve system of algebraic equation.
4. To know the basic concepts of linear algebra i.e., linear transformations, eigen values, diagonalization and orthogonalization to solve engineering problems.
5. Apply Taylor series to approximate functions and estimate the error of approximation

**Note:**

1. The paper setter will set a first compulsory question comprising of 6 to 10 sub parts (short questions), covering the entire syllabus and two questions (with/without parts) from each unit. The examinee will attempt five questions in all, along with the compulsory question (with all it sub parts), selecting one question from each unit. All Questions will carry equal marks i.e. 14 marks each.

2. The use of programmable devices such as programmable calculators etc. is not allowed during the exam. Sharing of materials will not be permitted during examination.

## B.Tech. Semester-I

### (Common for all Branches except CSE)

**Course Title: Mathematics-I**

**Course Code: BT MAT 112B**

**Category: Basic Science Course**

| L | T | P | Credits |
|---|---|---|---|
| 3 | 1 | -- | 4 |

| | | |
|---|---|---|
| Class Work | : | 30 Marks |
| Examination | : | 70 Marks |
| Total | : | 100 Marks |
| Duration of Examination | : | 3 Hours |

**Course objectives:**

1. To familiarize the students with tools and Techniques in calculus and analysis.
2. To equip the students with standard concepts towards tackling various applications that are useful in several disciplines.
3. To understand liner algebra concepts and their application in different fields of engineering
4. To have the idea of vector calculus and its applications
5. To give adequate exposure of basics of Engineering Mathematics so as to enable them to visualize engineering problems by using Mathematical tools and to support their subsequent engineering studies.
6. To introduce to students the concept of convergence of sequences and series.

**Unit-I**

Inverse and rank of a matrix, System of linear equations; Symmetric, skew-symmetric and orthogonal matrices; Eigenvalues and eigenvectors; Diagonalization of matrices; Cayley-Hamilton Theorem and its application, Orthogonal transformation. Similar matrices.

**Unit –II**

Convergence of sequence and series, tests for convergence for Infinite series, absolutely convergent series, Power series, Taylor's and Maclaurin series, series for exponential, trigonometric and logarithm functions.

**Unit-III**

Taylor's and Maclaurin theorems with remainders; Asymptotes, Curvature, Evaluation of definite and improper integrals; Beta and Gamma functions and their properties; Applications of definite integrals to evaluate surface areas and volumes of revolutions.

**Unit-IV**

Function of several variables: Limit, continuity and partial derivatives, Total derivative; Jacobian, Taylor's theorem for two variables; Maxima, minima and saddle points; Method of Lagrange multipliers; Differentiation under Integral Sign.

**Text Books:**


[1] E. Kreyszig, Advanced Engineering Mathematics, 10 edition. Hoboken, NJ: Wiley, 2011.

[2] B. Ramana, Higher Engineering Mathematics, 1st edition. New Delhi: McGraw Hill Education, 2017.

[3] B. S. Grewal, Higher Engineering Mathematics 44th Edition. Khanna Publishers, 2017.

[4] R. K. Jain and S. R. K. Iyengar, Advanced Engineering Mathematics 4/e ), Fourth edition edition. Oxford: Narosa Publishing House Pvt. Ltd. - New Delhi, 2012.


**Reference Books:**


[1] J. R. Hass, C. E. Heil, and M. D. Weir, Thomas' Calculus, 14 edition. Boston? Pearson, 2017.

[2] P. S. Das and C. Vijayakumari, Engineering Mathematics, First edition. Place of publication not identified: Pearson Education, 2017.
[3] J. Bird, Higher Engineering Mathematics, 7th ed, 7 edition. Abingdon, Oxon ; New York, NY: Routledge, 2014.
[4] T. Veerarajan, Engineering Mathematics. McGraw Hill Education India Pvt Ltd, 2007.

**Course outcomes:**

1. The students will understand the basic properties of Determinants and matrices & apply these concepts in solving linear simultaneous equations.
2. They will learn the basic concepts regarding convergence of series.
3. The students will learn concepts of vector calculus and apply it in most of the branches of engineering.
4. They will be able to solve Eigen value problems and apply Cayley-Hamilton theorem.

**Note:**

1. The paper setter will set a first compulsory question comprising of 6 to 10 sub parts (short questions), covering the entire syllabus and two questions (with/without parts) from each unit. The examinee will attempt five questions in all, along with the compulsory question (with all it sub parts), selecting one question from each unit. All Questions will carry equal marks i.e. 14 marks each.
2. The use of programmable devices such as programmable calculators etc. is not allowed during the exam. Sharing of materials will not be permitted during examination.

B. Tech. (Semester – I/ II) Physics

# Mechanics

| Course Code | Branch Name | Course Title | Teaching Schedule | | | Marks of Class Work | Examination Marks | | Total | Credits | Duration of Exam |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | L | T | P | | Theory | Practical | | | |
| BT PHY 113A | CE | Mechanics | 3 | 1 | 0 | 30 | 70 | 0 | 100 | 4 | 3 |

**Pre-requisites:** (i) High-school education

**Course Objectives:**

1. To have basic understanding vector mechanics.
2. To study various frame of references.
3. To get aware about Harmonic motion,
4. To gain knowledge on rigid body mechanics.
5. To study solid body motion and different frictional forces.

**Course outcomes**

Students will be familiar with

1. Newton's Law
2. Frame of references
3. Harmonic motion
4. Rigid body and its mechanics
5. solid body motion and different frictional forces

**Syllabus:**

## UNIT I

### Vector Mechanics of Particles

Transformation of scalars and vectors under Rotation transformation; Forces in Nature: Newton's laws and its completeness in describing particle motion; Form invariance of Newton's Second Law; Solving Newton's equations of motion in polar coordinates; Problems including constraints and friction; Extension to cylindrical and spherical coordinates.

## UNIT II

### Mechanics of Particles in Motion and Harmonic Motion

Potential energy function: F = - Grad V, equipotential surfaces and meaning of gradient; Conservative and non-conservative forces, curl of a force field; Central forces; Conservation of Angular Momentum; Energy equation and energy diagrams; Elliptical, parabolic and hyperbolic orbits; Kepler problem; Application: Satellite manoeuvres:

Non-inertial frames of reference; Rotating coordinate system: Five-term acceleration formula. Centripetal and Coriolis accelerations; Applications: Weather systems, Foucault pendulum;

Harmonic oscillator; Damped harmonic motion – over-damped, critically damped and lightly-damped oscillators; Forced oscillations and resonance.

**UNIT III**

**Rigid Body Mechanics**

Definition and motion of a rigid body in the plane; Rotation in the plane; Kinematics in a coordinate system rotating and translating in the plane; Angular momentum about a point of a rigid body in planar motion; Euler's laws of motion, their independence from Newton's laws, and their necessity in describing rigid body motion; Examples.

Introduction to three-dimensional rigid body motion — only need to highlight the distinction from two-dimensional motion in terms of (a) Angular velocity vector, and its rate of change and (b) Moment of inertia tensor; Three-dimensional motion of a rigid body wherein all points move in a coplanar manner: e.g. Rod executing conical motion with center of mass fixed — only need to show that this motion looks two-dimensional but is three-dimensional, and two dimensional formulation fails.

**UNIT IV**

**Statics of Solids**

Free body diagrams with examples on modelling of typical supports and joints; Condition for equilibrium in three- and two- dimensions; Friction: limiting and non-limiting cases; Force displacement relationship; Geometric compatibility for small deformations; Illustrations through simple problems on axially loaded members like trusses.

**Suggested Reference Books**

(i) Engineering Mechanics, 2nd ed. — MK Harbola, Cengage Learning India publisher

(ii) Introduction to Mechanics — MK Verma, CRC Press

(iii) An Introduction to Mechanics — D Kleppner & R Kolenkow, University Printing House, Cambridge

(iv) Principles of Mechanics — JL Synge & BA Griffiths, McGraw-Hill

(v) Mechanics — JP Den Hartog, Dover Publication

(vi) Engineering Mechanics - Dynamics, 7th ed. - JL Meriam, Wiley Publisher

(vii) Mechanical Vibrations — JP Den Hartog, Dover Publication

(viii) Theory of Vibrations with Applications — WT Thomson, Pearson Publisher

**Note:**

1. The paper setter will set a first compulsory question comprising of 6 to 10 sub parts (short questions), covering the entire syllabus and two questions (with/without parts) from each unit. The examinee will attempt five questions in all, along with the compulsory question (with all it sub parts), selecting one question from each unit. All Questions will carry equal marks i.e. 14 marks each.
2. The use of programmable devices such as programmable calculators etc. is not allowed during the exam. Sharing of materials will not be permitted during examination.

**B. Tech. (Semester – I/ II)**

**Waves, Optics & Quantum Mechanics**

**Course Objectives:**

1. To have basic understanding of optics and its applications.
2. To study light propagation.
3. To get aware about wave optics and lasers.

| Course Code | Branch Name | Course Title | Teaching Schedule | | | Marks of Class Work | Examination Marks | | Total | Credits | Duration of Exam |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | L | T | P | | Theory | Practical | | | |
| BT PHY 115 A | EE &PPT | Waves, Optics & Quantum Mechanics | 3 | 1 | 0 | 30 | 70 | 0 | 100 | 4 | 3 |

4. To have basic knowledge about Quantum Mechanical phenomena's.
5. To gain knowledge on solids and semiconducting materials.

**Course outcomes**

Students will be familiar with

1. Wave motion
2. principles, types and applications of lasers
3. basic laws related to quantum mechanics
4. Simple quantum mechanics calculations
5. Various terms related to semiconducting properties of materials

**Syllabus:**

**UNIT – I**

**Wave and Light Motion**

Waves: Mechanical and electrical simple harmonic oscillators, damped harmonic oscillator, forced mechanical and electrical oscillators, impedance, steady state motion of forced damped harmonic oscillator

Non-dispersive transverse and longitudinal waves: Transverse wave on a string, the wave equation on a string, Harmonic waves, reflection and transmission of waves at a boundary, impedance matching, standing waves and their Eigen frequencies, longitudinal waves and the wave equation for them, acoustics waves.

Light and Optics: Light as an electromagnetic wave and Fresnel equations, reflectance and transmittance, Brewster's angle, total internal reflection, and evanescent wave.

**UNIT – II**

**Wave Optics and Lasers**

Wave Optics: Huygens' principle, superposition of waves and interference of light by wave-front splitting and amplitude splitting; Young's double slit experiment, Newton's rings, Michelson interferometer, Farunhofer diffraction from a single slit and a circular aperture, the Rayleigh criterion for limit of resolution and its application to vision; Diffraction gratings and their resolving power.

Lasers: Einstein's theory of matter radiation interaction and A and B coefficients; amplification of light by population inversion, different types of lasers: gas lasers (He-Ne, CO), solid-state lasers (ruby, Neodymium), dye lasers; Properties of laser beams: mono-chromaticity.

**UNIT – III**

**Introduction to Quantum Mechanics**

Wave nature of Particles, Time-dependent and time-independent Schrodinger equation for wave function. Born interpretation, probability current, Expectation values, Free-particle wave function and wave-packets, Uncertainty principle.

Solution of stationary-state Schrodinger equation for one dimensional problems–particle in a box,

| Course Code | Branch Name | Course Title | Teaching Schedule | | | Marks of Class Work | Examination Marks | | Total | Credits | Duration of Exam |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | L | T | P | | Theory | Practical | | | |
| BT PHY 117 A | CSE | Semiconductor Physics | 3 | 1 | 0 | 30 | 70 | 0 | 100 | 4 | 3 |

particle in attractive delta-function potential, square-well potential, linear harmonic oscillator. Scattering from a potential barrier and tunneling; related examples like alpha- decay, field-ionization and scanning tunneling microscope, tunneling in semiconductor structures.

## UNIT – IV

### Introduction to Solids and Semiconductors

Free electron theory of metals, Fermi level, density of states in 1, 2 and 3 dimensions, Bloch's theorem for particles in a periodic potential, Kronig-Penney model and origin of energy bands. Types of electronic materials: metals, semiconductors, and insulators. Intrinsic and extrinsic semiconductors, Dependence of Fermi level on carrier-concentration and temperature (equilibrium carrier statistics), Carrier generation and recombination, Carrier transport: diffusion and drift, p -n junction.

**References:**


1. I. G. Main, "Vibrations and waves in physics", Cambridge University Press, 1993.
2. H. J. Pain, "The physics of vibrations and waves", Wiley, 2006.
3. E. Hecht, "Optics", Pearson Education, 2008.
4. A. Ghatak, "Optics", McGraw Hill Education, 2012.
5. O. Svelto, "Principles of Lasers", Springer Science & Business Media, 2010.
6. D. J. Griffiths, "Quantum mechanics", Pearson Education, 2014.
7. R. Robinett, "Quantum Mechanics", OUP Oxford, 2006.
8. D. McQuarrie, "Quantum Chemistry", University Science Books, 2007.
9. D. A. Neamen, "Semiconductor Physics and Devices", Times Mirror High Education Group. Chicago, 1997.
10. E.S. Yang, "Microelectronic Devices", McGraw Hill, Singapore, 1988.
11. B.G. Streetman, "Solid State Electronic Devices", Prentice Hall of India, 1995.


**Note:**

1. The paper setter will set a first compulsory question comprising of 6 to 10 sub parts (short questions), covering the entire syllabus and two questions (with/without parts) from each unit. The examinee will attempt five questions in all, along with the compulsory question (with all it sub parts), selecting one question from each unit. All Questions will carry equal marks i.e. 14 marks each.
2. The use of programmable devices such as programmable calculators etc. is not allowed during the exam. Sharing of materials will not be permitted during examination.

**B. Tech. (Semester – I/ II) Physics**

**Semiconductor Physics**

**Pre-requisite:** "Introduction to Quantum Mechanics" Desirable

**Course Objectives:**

1. To give the detailed idea how the electronic bands are formed
2. To characterize materials based on band gap.
3. To provide the sound knowledge on semiconductor physics
4. To study light semiconductor interactions.
5. To know how the band gap and defects concentration can be find out.

**Course Outcomes:**

1. Able to differentiate how the band originated
2. Successfully differentiate the materials types based on their band gap values and use this knowledge as per their requirements.
3. Know about how the junctions are formed in PN diode and its theory.
4. Students have the idea of solar cell and it's working with advantages.
5. Successfully find the band gap, reflection and transmission percentage of a grown film over substrate with contents of defects.

**Syllabus**

**UNIT - I**

**Electronic Materials**

Free electron theory, Density of states and energy band diagrams, Kronig-Penny model (to introduce origin of band gap), Energy bands in solids, E-k diagram, Direct and indirect bandgaps, Types of electronic materials: metals, semiconductors, and insulators, Density of states, Occupation probability, Fermi level, Effective mass, Phonons.

**UNIT - II**

**Semiconductors**

Intrinsic and extrinsic semiconductors, Dependence of Fermi level on carrier-concentration and temperature (equilibrium carrier statistics), Carrier generation and recombination, Carrier transport: diffusion and drift, p-n junction, Metal-semiconductor junction (Ohmic and Schottky), Semiconductor materials of interest for optoelectronic devices.

**UNIT - III**

**Light-Semiconductor Interaction**

Optical transitions in bulk semiconductors: absorption, spontaneous emission, and stimulated emission; Joint density of states, Density of states for photons, Transition rates (Fermi's golden rule), Optical loss and gain; Photovoltaic effect, Exciton, Drude model.

**UNIT - IV**

**Measurements & Engineered Semiconductor Materials**

Four-point probe and van der Pauw measurements for carrier density, resistivity, and hall mobility; Hot-point probe measurement, capacitance-voltage measurements, parameter extraction from diode I-V characteristics, DLTS, band gap by UV-Vis spectroscopy, absorption/transmission.
Density of states in 2D, 1d and 0D (qualitatively). Practical examples of low-dimensional systems such as quantum wells, wires, and dots: design, fabrication, and characterization techniques. Heterojunctions and associated band-diagrams

**References:**

1. J. Singh, Semiconductor Optoelectronics: Physics and Technology, McGraw-Hill Inc. (1995).

2. B. E. A. Saleh and M. C. Teich, Fundamentals of Photonics, John Wiley & Sons, Inc., (2007).

3. S. M. Sze, Semiconductor Devices: Physics and Technology, Wiley (2008).

4. A. Yariv and P. Yeh, Photonics: Optical Electronics in Modern Communications, Oxford University Press, New York (2007).

5. P. Bhattacharya, Semiconductor Optoelectronic Devices, Prentice Hall of India (1997).

6. Online course: "Semiconductor Optoelectronics" by M R Shenoy on NPTEL

7. Online course: "Optoelectronic Materials and Devices" by Monica Katiyar and Deepak Gupta on NPTEL.

**Note:**

1. The paper setter will set a first compulsory question comprising of 6 to 10 sub parts (short questions), covering the entire syllabus and two questions (with/without parts) from each unit. The examinee will attempt five questions in all, along with the compulsory question (with all it sub parts), selecting one question from each unit. All Questions will carry equal marks i.e. 14 marks each.
2. The use of programmable devices such as programmable calculators etc. is not allowed during the exam. Sharing of materials will not be permitted during examination.



Course Title: Chemistry

Course Code: BT CH 102A

B. Tech. Semester – I/II (Common for all Branches)

| L | T | P | Credits |
|---|---|---|---|
| 3 | 1 | 0 | 4 |

| | | |
|---|---|---|
| Class Work | : | 30 Marks |
| Examination | : | 70 Marks |
| Total | : | 100 Marks |
| Duration of Examination | : | 3 Hours |

**Course Objectives:**

1. To give students in-depth knowledge of Atomic and molecular structures.
2. To make students understand and analyse periodic properties and related concepts.
3. To give knowledge of Stereochemistry, Organic reactions and synthesis of a drug molecule.
4. To apprise students of Intermolecular forces and potential energy surfaces and use of free energy in chemical equilibria.

## UNIT-I

**Atomic and molecular structure:** Schrodinger equation. Particle in a box solutions and their applications for conjugated molecules and nanoparticles. Forms of the hydrogen atom wave functions and the plots of these functions to explore their spatial variations(derivation excluded). Molecular orbitals of diatomic molecules and plots of the multicenter orbitals. Molecular orbital energy level diagrams of diatomic. Pi-molecular orbitals of butadiene and benzene . Crystal field theory and the energy level diagrams for transition metal ions . Band structure of solids and the role of doping on band structures.

**Periodic properties**: Effective nuclear charge, penetration of orbitals, variations of s, p, d and f orbital energies of atoms in the periodic table, electronic configurations, atomic and ionic sizes, ionization energies, electron affinity and electronegativity, polarizability, oxidation states.

## UNIT-II

**Stereochemistry:** Representations of 3 dimensional structures, structural isomers and stereoisomers Configurations, symmetry chirality, enantiomers, diastereomers. Optical activity, absolute configurations and conformational analysis.

**Organic reactions and synthesis of a drug molecule**: Introduction to reactions involving substitution, addition, elimination, oxidation, reduction, cyclization and ring openings. Synthesis of a commonly used drug molecule (Asprin/Paracetamol).

## UNIT-III

**Intermolecular forces and potential energy surfaces:** Ionic, dipolar and van der Waals interactions. Equations of state of real gases and critical phenomena. Potential energy surfaces (with example).

**Use of free energy in chemical equilibria:** Thermodynamic functions: energy, entropy and free energy. Estimations of entropy and free energies. Free energy and emf. Cell potentials, the Nernst equation and applications. Acid base equilibria, oxidation reduction and solubility equilibria. Water chemistry. Corrosion. Use of free energy considerations in metallurgy through Ellingham diagrams.

## UNIT-IV

**Spectroscopic techniques and applications :** Principles of spectroscopy and selection rules. Electronic spectroscopy. Fluorescence and its applications in medicine. Vibrational and rotational spectroscopy of diatomic molecules and its applications. Nuclear magnetic resonance and magnetic resonance imaging,surface characterisation techniques. Diffraction and scattering.

**Suggested Text Books:**

(i) University Chemistry by Bruce M. Mahan, 4th Edition, Pearson Education.

(ii) Chemistry: Principles and Applications, by M. J. Sienko and R. A. Plane

(iii)Fundamentals of Molecular Spectroscopy, by C. N. Banwell

(iv) Engineering Chemistry (NPTEL Web-book), by B. L. Tembe, Kamaluddin and M. S. Krishnan

(v) Physical Chemistry, by P. W. Atkins

(vi) Organic Chemistry: Structure and Function by K. P. C. Volhardt and N. E. Schore, 5th Edition.

(vii) Organic chemistry, by R.T Morrison, R.N Boyd, 7th Edition, Pearson Education.

**Course Outcomes**

1. The concepts developed in this course will aid in quantification of several concepts in chemistry that have been introduced at the 10+2 levels in schools. Technology is being increasingly based on the electronic, atomic and molecular level modifications. Students will be able to understand these concepts upto advanced level
2. Quantum theory is more than 100 years old and to understand phenomena at nanometer levels, students will be able to understand the description of all chemical processes at molecular levels.
3. The course will enable the student to: Analyse microscopic chemistry in terms of atomic and molecular orbitals and intermolecular forces. Rationalise bulk properties and processes using thermodynamic considerations.
4. Distinguish the ranges of the electromagnetic spectrum used for exciting different molecular energy levels in various spectroscopic techniques.Rationalise periodic properties such as ionization potential, electronegativity, oxidation states and lectronegativity.

**Notes:**

1.The paper setter will set two question (with /without parts)from each of the four units, a ninth compulsory question comprising of 6 to 10 sub parts, covering the entire syllabus. The examinee will attempt 5 questions in all, along with the compulsory question (with all it subparts), selecting one question from each unit.

2. The use of programmable devices such as programmable calculators, etc is not allowed during the exam.

3.. A specific note shall be inserted in relevant question paper where ever the use of graph papers, semi-log papers, steam tables,etc.shall be allowed during the examination.

**Course Title: BASIC ELECTRICAL ENGINEERING**
**Course Code: BT EE 103A**

**B. Tech. Semester – I/II (Common for all Branches except Chemical Engineering)**

| L | T | P | Credits |
|---|---|---|---|
| 3 | 1 | 0 | 4 |

| | | |
|---|---|---|
| **Class Work** | : | **30 Marks** |
| **Examination** | : | **70 Marks** |
| **Total** | : | **100 Marks** |
| **Duration of Examination** | : | **3 Hours** |

**Course Objectives:**

1. To analyze dc and ac circuits.
2. To design and analyze RLC networks.
3. To appreciate basic knowledge of electric machines.
4. To assimilate elementary knowledge of electric installations.

**UNIT-1**

**D.C. Circuits & Theorems:** Basics of electric circuit elements, Kirchhoff's laws & its applications including those based on dependent sources, Nodal and Loop methods of Analysis, Star-Delta and delta-star transformations. Network Theorems: Thevenin's theorem, Norton's theorem, Superposition theorem, Maximum Power transfer theorem. **(11 Hours)**

**UNIT-2**

**Single A.C. Circuits:** Sinusoidal signal, instantaneous & peak values, average and RMS values, form factor, peak factor. Concept of Phasors: Rectangular & Polar, Trigonometric & Exponential forms. Behaviour of R, L, C components in ac circuits. Time domain analysis of first-order RL and RC circuits. Series and parallel circuits: Active and reactive power, power factor, Resonance in series and parallel circuits. Q-factor, cut off frequencies and bandwidth. Three Phase Circuits: Phase and line voltages and currents, balanced star and delta circuits. **(11 Hours)**

**UNIT-3**

**Electrical Machines:** Construction, working principle, type, & equation of Single phase Transformer, Ideal Transformer, Phasor diagrams of Single-phase Transformer at no load and on load, Equivalent circuit, losses, efficiency. Three phase Transformer connections.single phase Autotransformer. Rotating Machines: Construction, operating principle of d.c. motors and its torque speed characteristics. Construction and working principle & type of single phase Induction motor & Three-phase Induction motor, concept of slip & torque-speed characteristics, construction and working of synchronous generators.**(11Hours)**

**UNIT-4**

**Electrical and electronics components:** Components of LT Switchgear: Switch Fuse Unit (SFU), MCB( Miniature Circuit Breaker), ELCB(Earth Leakage Circuit Breaker), MCCB( Moulded Case Circuit Breaker), Types of Wires and Cables, Earthing, Types of Batteries, Important Characteristics of Batteries, Elementary calculations for energy consumption, Introduction to power factor improvement and battery backup. **(11 Hours)**

**Course Outcomes:**

1. Students will be able to analyze dc and ac circuits.
2. Students will be able to solve, design and synthesize electrical networks mathematically.
3. Obtain basic knowledge of electric installations.
4. Imbibe elementary knowledge of electric machines.

**TEXT BOOKS:**


1. Del Toro, "Principles of Electrical Engineering", 2nd Edition,Pearson Education.
2. D.P.Kothari & I. J. Nagarath, "Basic Electrical Engg", TMH, New Delhi, 3rd edition.
3. B.L. Theraja & A. K. Theraja, "Electrical Technology", (Vol-I, Vol-II), S.Chand.
4. Edward Hughes, "Electrical & Electronics Technology", 10th Edition,Pearson Education.


**REFERENCE BOOKS:**


1. T.K. Nagsarkar & M.S Sukhija, "Basic Electrical Engineering", OXFORD Uni. Press.2004.
2. L. S. Bobrow, "Fundamentals of Electrical Engineering", Oxford University Press.
3. D.C. Kulshreshtha, "Basic Electrical Engineering", Mc Graw Hill.
4. Hayt & Kemmerly, "Engineering Circuit Analysis", Mc Graw Hill.
5. "Schaum's Outline of Electric Circuits", Mc Graw Hill.
6. A.K.Sawhney, A Course in Electronic Measurements and Instrumentation", Dhanpat Rai & Co.
7. S.K. Sahdev, "Basic Electrical Engineering" Pearson Education.


**Note:**

1. The paper setter will set a first compulsory question comprising of 6 to 10 sub parts (short questions), covering the entire syllabus and two questions (with/without parts) from each unit. The examinee will attempt five questions in all, along with the compulsory question (with all it sub parts), selecting one question from each unit. All Questions will carry equal marks i.e. 14 marks each.
2. The use of programmable devices such as programmable calculators etc. is not allowed during the exam. Sharing of materials will not be permitted during examination.

**Course Title: Programming for Problem Solving**

**Course Code: BT CSE 104A**

**B. Tech. Semester – I/II**

| L | T | P | Credits |
|---|---|---|---|
| 3 | 0 | 0 | 3 |

| | | |
|---|---|---|
| **Class Work** | : | **30 Marks** |
| **Examination** | : | **70 Marks** |
| **Total** | : | **100 Marks** |
| **Duration of Examination** | : | **3 Hours** |

[The lab component should have one hour of tutorial followed or preceded by laboratory assignments.]

Pre-requisites ( if any): NIL

**Course Objectives:**

1. To make students understand basics of parts of computers and the programming.
2. To give knowledge of basic constructs of computer programming.
3. To make students understand Recursion.
4. To impart knowledge of Basic Algorithms.

**Unit I ( 10 Lectures)**

Introduction to components of a computer system (disks, memory, processor, where a program is stored and executed, operating system, compilers etc.), Introduction to Programming .Idea of Algorithm: steps to solve logical and numerical problems. Representation of Algorithm: Flowchart/ Pseudocode with examples. ,From algorithms to programs; source code, variables (with data types) variables and memory locations, Syntax and Logical Errors in compilation, object and executable code.

**Unit II (10 Lectures)**

Arithmetic expressions and precedence, Conditional Branching and Loops, Writing and evaluation of conditionals and consequent branching ,Iteration and loops Arrays: Arrays (1-D, 2-D), Character arrays and Strings, Functions (including using built in libraries), Parameter passing in functions, call by value, Passing arrays to functions: idea of call by reference

**Unit III (10 Lectures)**

Recursion: Recursion, as a different way of solving problems. Example programs, such as Finding Factorial, Fibonacci series, Ackerman function etc. Structure: Defining structures and Array of Structures, Pointers :Idea of pointers, Defining pointers, Use of Pointers in self-referential structures, notion of linked list (no implementation)

**Unit IV (10 Lectures)**

Basic Algorithms: Searching (Linear and binary search), Basic Sorting Algorithms (Bubble, Insertion, Quick sort), Finding roots of equations, notion of order of complexity through example programs (no formal definition required)File handling (only if time is available, otherwise should be done as part of the lab)

**Suggested Text Books:**

1. Byron Gottfried, Schaum's Outline of Programming with C, McGraw-Hill
2. E. Balaguruswamy, Programming in ANSI C, Tata McGraw-Hill

**Suggested Reference Books :**

1. Brian W. Kernighan and Dennis M. Ritchie, The C Programming Language, 2nd Edition, Pearson Education.

**Course Outcomes:**

The student will learn

1. To formulate simple algorithms for arithmetic and logical problems.
2. To translate the algorithms to programs (in C language).
3. To test and execute the programs and correct syntax and logical errors
4. To implement conditional branching, iteration and recursion.
5. To decompose a problem into functions and synthesize a complete program using divide and conquer approach.
6. To use arrays, pointers and structures to formulate algorithms and programs.
7. To apply programming to solve matrix addition and multiplication problems and searching and sorting problems.
8. To apply programming to solve simple numerical method problems, namely rot finding of function, differentiation of function and simple integration.

**Note:**

1. The paper setter will set a first compulsory question comprising of 6 to 10 sub parts (short questions), covering the entire syllabus and two questions (with/without parts) from each unit. The examinee will attempt five questions in all, along with the compulsory question (with all it sub parts), selecting one question from each unit. All Questions will carry equal marks i.e. 14 marks each.
2. The use of programmable devices such as programmable calculators etc. is not allowed during the exam. Sharing of materials will not be permitted during examination.

**Course Title: Engineering Graphics & Design(Theory and Lab)**

**Course Code: BT ME 105A**

**B. Tech. Semester – I/II**

| L | T | P | Credits |
|---|---|---|---|
| 1 | 0 | 4 | 3 |

| | | |
|---|---|---|
| **Class Work** | : | **30 Marks** |
| **Practical Examination** | : | **70 Marks** |
| **Total** | : | **100 Marks** |
| **Duration of Examination** | : | **3 Hours** |

**Objectives** All phases of manufacturing or construction require the conversion of new ideas and design concepts into the basic line language of graphics. Therefore, there are many areas (civil, mechanical, electrical, architectural and industrial) in which the skills of the CAD technicians play major roles in the design and development of new products or construction. Students prepare for actual work situations through practical training in a CAD laboratory using engineering software. The course is designed to achieve:

- To prepare the students to communicate effectively through Traditional Engineering Graphics and using Computer Graphics Software
- To prepare the students to use the techniques, skills and modern engineering graphics tools necessary for engineering practice

| S. No. | Contents(L-12/P-48) | Contact Hours |
|---|---|---|
| 1 | ***Introduction to Engineering Drawing,*** Principles of Engineering Graphics and their significance, usage of Drawing instruments, lettering, Conic sections including the Rectangular Hyperbola (General method only);Cycloid, Epicycloid, Hypocycloid and Involute; Scales – Plain, Diagonal and Vernier Scales | L-2 P-4 |
| 2 | ***Orthographic Projections,*** Principles of Orthographic Projections-Conventions - Projections of Points and lines inclined to both planes; Projections of planes inclined Planes - Auxiliary Planes | L-1 P-6 |
| 3 | ***Projections of Regular Solids,*** those inclined to both the Planes- Auxiliary Views; Draw simple annotation, dimensioning and scale. Floor plans that include: windows, doors, and fixtures such as WC, bath, sink,shower, etc. | L-1 P-6 |
| 4 | ***Sections and Sectional Views of Right Angular Solids,*** Prism, Cylinder, Pyramid, Cone – Auxiliary Views; Development of surfaces of Right Regular Solids - Prism, Pyramid, Cylinder and Cone; Draw the sectional orthographic views of geometrical solids, objects from industry and dwellings (foundation to slab only) | L-1 P-4 |
| 5 | ***Isometric Projections ,*** Principles of Isometric projection – Isometric Scale, Isometric Views, Conventions; Isometric Views of lines, Planes, Simple and compound Solids; Conversion of Isometric Views to Orthographic Views and Vice-versa, Conventions | L-1 P-4 |
| 6 | ***Overview of Computer Graphics*** listing the computer technologies that impact on graphical communication, Demonstrating knowledge of the theory of CAD software [such as: The Menu System, Toolbars (Standard, Object Properties, Draw, Modify and Dimension), Drawing Area (Background, Crosshairs, Coordinate System), Dialog boxes and windows, Shortcut menus (Button Bars), The Command Line (where applicable), The Status Bar, Different methods of zoom as used in CAD, Select and erase objects.; Isometric Views of lines, Planes, Simple and compound Solids] | L-2 P-4 |
| 7 | ***Customisation & CAD Drawing*** consisting of set up of the drawing page and the printer, including scale settings, Setting up of units and drawing limits; ISO and ANSI standards for coordinate dimensioning and | L-1 |

| | | |
|---|---|---|
| | tolerancing; Orthographic constraints. Snap to objects manually and automatically; Producing drawings by using various coordinate input entry methods to draw straight lines Applying various ways of drawing circles | P-4 |
| 8 | ***Annotations, layering & other functions*** applying dimensions to objects, applying annotations to drawings; Setting up and use of Layers, layers to create drawings. Create, edit and use customized layers; Changing line lengths through modifying existing lines (extend/lengthen); Printing documents to paper using the print command; orthographic projection techniques; Drawing sectional views of composite right regular geometric solids and project the true shape of the sectioned surface; Drawing annotation. Computer-aided design (CAD) software modeling of parts and assemblies. Parametric and non-parametric solid, surface, and wireframe models. Part editing and two-dimensional documentation of models. Planar projection theory, including sketching of perspective, isometric, multiview, auxiliary, and section views. Spatial visualization exercises. Dimensioning guidelines, tolerancing techniques; dimensioning and scale multi views of dwelling | L-1<br>P-8 |
| 9 | ***Demonstration of a simple team design project*** Geometry and topology of engineered components: creation of engineering models and their presentation in standard 2D blueprint form and as 3D wire-frame and shaded solids; meshed topologies for engineering analysis and tool-path generation for component manufacture: geometric dimensioning and tolerancing; Use of solid-modeling software for creating associative models at the component and assembly levels; floor plans that include: windows, doors, and fixtures such as WC, bath, sink, shower, etc. Applying colour coding according to building drawing practice; Drawing sectional elevation showing foundation to ceiling; Introduction to Building Information Modelling (BIM). | L-1<br>P-8 |

**Suggested Text/Reference Books:**

(i) Bhatt N.D., Panchal V.M. & Ingle P.R., (2014), Engineering Drawing, Charotar Publishing House
(ii) Shah, M.B. & Rana B.C. (2008), Engineering Drawing and Computer Graphics, Pearson Education
(iii)Agrawal B. & Agrawal C. M. (2012), Engineering Graphics, TMH Publication
(iv) Narayana, K.L. & P Kannaiah (2008), Text book on Engineering Drawing, Scitech Publishers
(v) (Corresponding set of) CAD Software Theory and User Manuals

**Course Outcomes**

All phases of manufacturing or construction require the conversion of new ideas and design concepts into the basic line language of graphics. Therefore, there are many areas (civil, mechanical, electrical, architectural and industrial) in which the skills of the CAD technicians play major roles in the design and development of new products or construction. Students prepare for actual work situations through practical training in a new state-of-the-art computer designed CAD laboratory using engineering software. This course is designed to address:

- to prepare you to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
- to prepare you to communicate effectively to prepare you to use the techniques, skills, and modern engineering tools necessary for engineering practice

The student will learn-

1. Introduction to engineering design and its place in society
2. Exposure to the visual aspects of engineering design
3. Exposure to engineering graphics standards
4. Exposure to solid modelling
5. Exposure to computer-aided geometric design
6. Exposure to creating working drawings
7. Exposure to engineering communication

**Course Title: Workshop/ Manufacturing Practices (Theory and Lab)**

**Course Code: BT ME 106A**

**B. Tech. Semester – I/II**

| L | T | P | Credits |
|---|---|---|---|
| 1 | 0 | 4 | 3 |

| | | |
|---|---|---|
| **Class Work** | : | **30 Marks** |
| **Practical Examination** | : | **70 Marks** |
| **Total** | : | **100 Marks** |
| **Duration of Examination** | : | **3 Hours** |

**Objectives** This course is aimed to provide

- Knowledge of different methods employed in manufacturing industries on the production fabrication process and measurement of their quality parameters
- Knowledge to decide about the appropriate methods and tool for manufacturing a given product/job
- Training to fabricate components with their own hands safely while working with different machine tools and hand tools
- Training to produce small devices through assembly of different components

**Detailed contents (L-10/P-48)**

| S.No. | contents | Contact Hours |
|---|---|---|
| **1** | **Lectures & videos: (10 hours)** | |
| i | Manufacturing Methods- casting, forming, machining, joining, advanced manufacturing methods | 3 |
| ii | CNC machining, Additive manufacturing | 2 |
| iii | Fitting operations & power tools | 1 |
| iv | Carpentry | 1 |
| v | Welding (arc welding & gas welding), brazing | 1 |
| vi | Metal casting | 1 |
| vii | Plastic moulding, glass cutting | 1 |
| **2.** | **Workshop Practice:(48 hours)** | |
| i | Machine shop | 12 |
| ii | Fitting shop | 6 |
| iii | Carpentry | 6 |
| iv | Welding shop | 6 |
| v | Casting | 6 |
| vi | Smithy | 6 |
| vii | Plastic moulding& Glass Cutting | 6 |

**Suggested Text/Reference Books:**

(i) Hajra Choudhury S.K., Hajra Choudhury A.K. and Nirjhar Roy S.K., "Elements of Workshop Technology", Vol. I 2008 and Vol. II 2010, Media promoters and publishers private limited, Mumbai.
(ii) Kalpakjian S. And Steven S. Schmid, "Manufacturing Engineering and Technology", 4th edition, Pearson Education India Edition, 2002.
(iii)Gowri P. Hariharan and A. Suresh Babu,"Manufacturing Technology – I" Pearson Education, 2008.
(iv) Roy A. Lindberg, "Processes and Materials of Manufacture", 4th edition, Prentice Hall India, 1998.
(v) Rao P.N., "Manufacturing Technology", Vol. I and Vol. II, Tata McGrawHill House, 2017.

**Course Outcomes**

Upon completion of this course, the students will gain knowledge of the different manufacturing processes which are commonly employed in the industry, to fabricate components using different materials. Examinations could involve the actual fabrication of simple components, utilizing one or more of the techniques covered above.

**Laboratory Outcomes**

- Upon completion of this laboratory course, students will be able to fabricate Components with their own hands.
- They will also get practical knowledge of the dimensional accuracies and dimensional tolerances possible with different manufacturing processes.
- By assembling different components, they will be able to produce small devices of their interest.

**Examinations could involve the actual fabrication of simple components, utilizing one or more of the techniques covered above.**



B.Tech. Semester I/II (Common for All Branches)

**Course Title:** English Language Lab

**Category :** Humanities

**Course Code:** BT HUM 107B

| L | T | P | Credits |
|---|---|---|---|
| 0 | 0 | 2 | 1 |

| | | |
|---|---|---|
| Class Work | : | 30 Marks |
| Examination | : | 70 Marks |
| Total | : | 100 Marks |
| Duration of Examination | : | 3 Hours |

**Course Objectives:**

1. To develop English language skills especially speaking and listening of the students
2. To make the students excel in their professional lives through proficiency in communication
3. To enhance the students linguistic and communicative competence
4. To enable them to face the challenges of professional and social life

**Course Outcomes:**

The Students will be able to

1. Acquire basic proficiency in Spoken English
2. Enhance their listening skills with listening comprehension exercises
3. Polish their speaking skills in English both at social and professional platforms
4. Present themselves confidently and meaningfully in professional and social circles.

**Course Contents:**

(i) Listening comprehension

(ii) Recognition of phonemes in International Phonetic Alphabet

(iii) Self- introduction and introduction of another person

(iv) Conversation and dialogues in common everyday situations & Tag Questions

(iv) Communication at work place (Standard phrases and sentences in various situations)

(vi) Technology & Communication: Netiquette

(vii) Speeches for special occasions (Welcome speeches, Introduction speeches, Felicitation speeches and Farewell speeches)

(viii) Formal Presentations on literary texts prescribed in theory paper

(ix) Body Language: For Interviews

(x) Body Language: For Group Discussions

**Note: Three hour time to each segment is recommended for instruction and practice.**

**Scheme of End Semester Practical Exam:**

1. A small passage may be read out to the examinees and they will have to write the answers to the questions asked at the end of the passage. Questions will be short answer type.
2. Examinees may be asked to identify the sounds of phonemes in given words.
3. Examinees may be asked to introduce themselves or others, participate in role play activities in mock situations, give short responses, engage in hypothetical telephonic conversation or supply the tag questions to statements etc.
4. Examinees may also be asked to deliver speeches on given situations or make presentation on the literary texts prescribed in Unit IV of theory paper.
5. Examinees may be asked to respond for mock interviews and different professional situations.

**Recommended Readings:**


1. Bhatnagar, Nitin and Mamta Bhatnagar. *Communicative English for Engineers and Professionals*. Pearson Education, 2013.
2. Swan, Michael. *Practical English Usage*. OUP, 1995.
3. Gangal, J.K. *Practical Course in Spoken English*. New Delhi: PHI Learning, 2015.
4. Konar, Nira. *Communication Skills for Professionals*. New Delhi: PHI Learning Pvt. Ltd., 2009.
5. Bansal, R.K. and J.B. Harrison. *Spoken English*. Orient Longman, 1983.
6. Sharma, Sangeeta and Binod Mishra. *Communication Skills for Engineers and Scientists*. Delhi: PHI Learning Pvt. Ltd., 2015.
7. Dorch, Patricia. *What Are Soft Skills?* New York: Execu Dress Publisher, 2013.
8. Kamin, Maxine. *Soft Skills Revolution: A Guide for Connecting with Compassion for Trainers, Teams, and Leaders*. Washington, DC: Pfeiffer & Company, 2013.
9. .


Note:

1. At least 10 experiments are to be performed by students in the semester.
2. At least 8 experiments should be performed from the above list; remaining two experiments may either be performed from the above list or designed and set by the Dept. as per the scope of the syllabus.

## B. Tech. (Semester – I/ II) Physics Lab

## Mechanics Lab

| Course Code | Branch Name | Course Title | Teaching Schedule | | | Marks of Class Work | Examination Marks | | Total | Credits | Duration of Exam |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | L | T | P | | Theory | Practical | | | |
| BT PHY 114A | CE | Mechanics Lab | 0 | 0 | 3 | 30 | 0 | 70 | 100 | 1.5 | 3 |

**Course Objectives:**

1. To make aware the students about very basic apparatuses like vernier calipers, screw gauge, spherometer, spectrometer etc.
2. To understand precision and error calculation in measurements.
3. To perform, take reading, do calculations and analyze the results obtained for the experiments related to mechanics.
4. To seek and co-relate the application of studied practical's in daily life.

**Course Outcomes:**

1. Students will be able to understand to take readings on very basic apparatuses like vernier calipers, screw gauge, spherometer, spectrometer etc.
2. Students will be aware about precision and error in measurements.
3. Students can take reading, do calculations and analyze the results obtained for the experiments related to mechanics.
4. Students are expected to co-relate the results of performed practical in daily life and can also seek new applications.

**Syllabus:**

**Note:**

Basic experiments on least count and error estimation (during orientation)

1. To aware about the least count of vernier calliper and screw gauge and to find the thickness of a slide using vernier calliper and diameter of wire using screw gauge.
2. Calculation of radius of curvature of a convex surface using spherometer.
3. Angel measurement using spectrometer.

**List of Subject related Experiments:**

1. To find the moment of inertia measurement of a fly wheel.
2. To find acceleration due to gravity using bar pendulum.
3. To examine resonance phenomena in mechanical oscillators.
4. To examine the behaviour of coupled pendulum.

5. To examine air track experiment and study Collisions between objects, governed by the laws of momentum and energy.
6. To find the modulus of rigidity of a wire using Maxwell's Needle.
7. To determine the moment of inertia of the given disc using Torsion pendulum.
8. To perform experiment on Rotation and Gyroscopic Precession.
9. To measure spring constant using Hook's Law.
10. To measure height of a distant object using sextant.

Note:

1. At least 10 experiments are to be performed by students in the semester.
2. At least 8 experiments should be performed from the above list; remaining two experiments may either be performed from the above list or designed and set by the Dept. as per the scope of the syllabus.



B. Tech. (Semester – I / II) Physics Lab

**Course Title: Waves, Optics & Quantum Mechanics Lab**

**Course Code: BT PHY116A**

**B. Tech. Semester – II**

| L | T | P | Credits |
|---|---|---|---|
| 0 | 0 | 3 | 1.5 |

| | | |
|---|---|---|
| **Class Work Marks** | : | **30** |
| **Examination Marks** | : | **70** |
| **Total Marks** | : | **100** |

## Waves, Optics & Quantum Mechanics Lab

**Course Objectives:**

1. To make aware the students about very basic apparatuses like vernier calipers, screw gauge, spherometer, spectrometer etc.
2. To understand precision and error calculation in measurements.
3. To perform, take reading, do calculations and analyze the results obtained for the experiments related to optics and quantum mechanics.
4. To seek and co-relate the application of studied practical's in daily life.

**Course Outcomes:**

1. Students will be able to understand to take readings on very basic apparatuses like vernier calipers, screw gauge, spherometer, spectrometer etc.
2. Students will be aware about precision and error in measurements.
3. Students can take reading, do calculations and analyze the results obtained for the experiments related to optics and quantum mechanics.
4. Students are expected to co-relate the results of performed practical in daily life and can also seek new applications.

**Syllabus:**

**Note:**

Basic experiments on least count and error estimation (during orientation)

1. To make aware the students about the least count of vernier calliper and screw gauge and to find the thickness of a slide using vernier calliper and diameter of wire using screw gauge.
2. Calculation of radius of curvature of a convex surface using spherometer.
3. Angel measurement using spectrometer.

**List of Subject related Experiments:**

1. To find out wavelength of monochromatic light using Newton's ring experiment.
2. To find out wavelength of monochromatic light using Diffraction grating.
3. To find out wavelength of monochromatic light using Freshnel's bi-prism

4. To examine interference phenomena using Michelson's Interferometer and to find out wavelength of monochromatic light.
5. To find specific rotation of sugar using Polarimeter
6. To find thickness of hair using He-Ne laser.
7. To find Cauchy's constants of a prism by using spectrometer.
8. To find resolving power of a telescope
9. To determine Planks constant using photocell.
10. To plot the characteristics of solar cell and find out the fill factor.
11. To verify the inverse square law with the help of a photovoltaic cell.
12. To examine Zeeman splitting using EPS/ ESR.

Note:

1. At least 10 experiments are to be performed by students in the semester.
2. At least 8 experiments should be performed from the above list; remaining two experiments may either be performed from the above list or designed and set by the Dept. as per the scope of the syllabus.

## B. Tech. (Semester – I / II) Physics Lab

## Semiconductor Physics Lab

| Course Code | Branch Name | Course Title | Teaching Schedule | | | Marks of Class Work | Examination Marks | | Total | Credits | Duration of Exam |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | L | T | P | | Theory | Practical | | | |
| BT PHY 118A | CSE | Semiconductor Physics Lab | 0 | 0 | 3 | 30 | 0 | 70 | 100 | 1.5 | 3 |

**Course Objectives:**

1. To make aware the students about very basic apparatuses like vernier calipers, screw gauge, spherometer, spectrometer etc.
2. To understand precision and error calculation in measurements.
3. To perform, take reading, do calculations and analyze the results obtained for the experiments related to semiconductor physics.
4. To seek and co-relate the application of studied practical's in daily life.

**Course Outcomes:**

1. Students will be able to understand to take readings on very basic apparatuses like vernier calipers, screw gauge, spherometer, spectrometer etc.
2. Students will be aware about precision and error in measurements.
3. Students can take reading, do calculations and analyze the results obtained for the experiments related to semiconductor physics.
4. Students are expected to co-relate the results of performed practical in daily life and can also seek new applications.

**Syllabus:**

**Note:**

Basic experiments on least count and error estimation (during orientation)

1. To aware about the least count of vernier calliper and screw gauge and to find the thickness of a slide using vernier calliper and diameter of wire using screw gauge.
2. Calculation of radius of curvature of a convex surface using spherometer.
3. Angel measurement using spectrometer.

**List of Subject related Experiments:**

1. To plot the forward and reverse characteristics of P-N junction diode.

2. To plot the characteristics of transistor in common base configuration.

3. To plot the characteristics of transistor in common emitter configuration.
4. To plot the characteristics of Junction field effect (JFET) transistor.
5. To plot the characteristics of Metal oxide semiconductor field effect (MOSFET) transistor.
6. To plot the characteristics of Solar cell and find out the fill factor.
7. To design and study Active and Passive filters.
8. To plot the reverse characteristics of Zener diode and voltage regulation using Zener Diode.
9. To determine Planks constant using photocell.
10. To measure e/m of electron using helical method.
11. To find capacitance of condenser using fleshing and quenching experiment.
12. To find temperature co-efficient of platinum using Callender Griffith bridge.
13. To find out low resistance by Carry Foster bridge.
14. To find resistance of galvanometer by post office box.
15. To compare the capacitance of two capacitors using De'Sauty Bridge.

Note:

1. At least 10 experiments are to be performed by students in the semester.
2. At least 8 experiments should be performed from the above list; remaining two experiments may either be performed from the above list or designed and set by the Dept. as per the scope of the syllabus.

**Course Title: CHEMISTRY LAB**

**Course Code: BT** CH 108A

**B. Tech. Semester – I/II** CHEMISTRY LAB (COMMON FOR ALL BRANCHES)

| L | T | P | Credits |
|---|---|---|---|
| 0 | 0 | 3 | 1.5 |

| | | |
|---|---|---|
| **Class Work Marks** | : | **30** |
| **Examination Marks** | : | **70** |
| **Total Marks** | : | **100** |

LIST OF EXPERIMENTS:

1. Determination of surface tension of given solvent by stalgmometer.
2. Removal of $Ca^{2+}$ and $Mg^{2+}$ hardness from given water sample using ion exchange coloumn.
3. Calculate the Rf value of given sample using thin layer chromatography.
4. Calculate the strength of strong acid by titrating it with strong base using conductometer.
5. Calculate the emf value of given cell.
6. Prepare the sample of urea formaldehyde and phenol formaldehyde.
7. Determination of chloride content in given water sample.
8. To find the kinetics of ethyl acetate with NaOH.
9. Preparation of asprin.
10. Calculate the sponification value of given oil sample.
11. Chemical analysis of two anions and two cations in given sample of salt.
12. Determination of the partition coefficient of a substance between two immiscible Liquids.
13. Determine the alkalinity of given water sample.
14. To examine the adsorption phenomena using acetic acid and charcoal.
15. Lattice structures and packing of spheres.
16. Determine the viscosity of given liquid using Ostwald viscometer.

**Course Outcomes:**

1. The chemistry laboratory course will consist of experiments illustrating the principles of chemistry relevant to the study of science and engineering.
2. The students will learn to: Estimate rate constants of reactions from concentration of reactants/products as a function of time.
3. Measure molecular/system properties such as surface tension, viscosity, conductance of solutions, redox potentials, chloride content of water, etc.
4. Synthesize a small drug molecule and analyse a salt sample

**Suggested Books:**

1. A Text book on Experiments and Calculation –Engineering Chemistry by S.S.Dara, S.Chand &
Company Ltd.
2. Essential of Experimental Engineering chemistry, Shashi Chawla, Dhanpat Rai Publishing Co.
3. Theory & Practice Applied Chemistry – O.P.Virmani, A.K. Narula ( New Age).

Note:

1. At least 10 experiments are to be performed by students in the semester.
2. At least 8 experiments should be performed from the above list; remaining two experiments may either be performed from the above list or designed and set by the Dept. as per the scope of the syllabus.



**Course Title: BASIC ELECTRICAL ENGINEERING LABORATORY**

**Course Code: BT EE 109B**

**B. Tech. Semester – I/II (Common for all Branches )**

| L | T | P | Credits | | | |
|---|---|---|---|---|---|---|
| 0 | 0 | 2 | 1 | Class Work Marks | : | 30 |
| | | | | Examination Marks | : | 70 |
| | | | | Total Marks | : | 100 |

## LIST OF EXPERIMENTS

1. To verify KCL and KVL.
2. To verify Thevenin's and Norton theorem.
3. To verify Superposition theorem and Maximum power transfer theorem.
4. To plot frequency response of series R-L-C circuit and determine resonant frequency & Q-factor for various values of R,L,C.
5. To plot frequency response of series R-L-C circuit and determine resonant frequency & Q-factor for various values of R,L,C.
6. To perform direct load test of a transformer and plot efficiency Vs load characteristic.
7. To perform O.C. and S.C. tests on single phase transformer.
8. To plot torque-speed characteristic of a D.C. shunt motor.
9. Study of various parts of Induction Machine.
10. Demonstration of components of LT switch gear like MCB, MCCB, SFU, ELCB and earthling.

**Laboratory Outcomes**

1. Get an exposure to common electrical components and their ratings.
2. Understand the usage of common electrical measuring instruments.
3. Student will be able to understand and design resonant circuits.
4. Understand the basic characteristics of transformers and electrical machines.

Note:

1. At least 10 experiments are to be performed by students in the semester.
2. At least 8 experiments should be performed from the above list; remaining two experiments may either be performed from the above list or designed and set by the Dept. as per the scope of the syllabus.

B. Tech. Semester – I/II

Course Title: **Programming for Problem Solving Lab.**

**Course Code: BT CSE110A**

**Category: Engineering Science Course**

| L | T | P | Credits |
|---|---|---|---|
| 0 | 0 | 4 | 2 |

| | | |
|---|---|---|
| **Class Work Marks** | : | **30** |
| **Examination Marks** | : | **70** |
| **Total Marks** | : | **100** |

**Course Objectives:**

1. To make students understand basics of computer languages and the programming
2. To give knowledge of basic constructs of computer programming.
3. To make students understand Recursion in programming.
4. To impart knowledge of Basic Algorithms.

**The laboratory should be preceded or followed by a tutorial to explain the approach or algorithm to be implemented for the problem given.**

**Tutorial 1:** Problem solving using computers:

**Lab1:** write a program to input your name and print in output.(to understand use of header files)

**Tutorial 2:** Variable types and type conversions:

**Lab 2:** write a program to solve simple computational problems using arithmetic expressions

**Tutorial 3:** Branching and logical expressions:

**Lab 3:** Write a Program using if-then-else structure.

**Tutorial 4:** Loops, while and for loops:

**Lab 4:** Write a program using different types of Loops.(While, Do-While and For Loop)

**Tutorial 5:** Arrays: searching, sorting:

**Lab 5:** Write a program using Array with searching and Sorting of Array.

**Tutorial 6:** 2D arrays and Strings

**Lab 6:** Write a program using Strings.

**Tutorial 7:** Functions, call by value:

**Lab 7:** Write a program using functions and Call by Value.

**Tutorial 8 &9:** Numerical methods (Root finding, numerical differentiation, numerical integration):

**Lab 8 and 9:** Write a program solving Numerical method problems (Ex-Calculator)

**Tutorial 10:** Recursion, structure of recursive calls

**Lab 10:** Write a Program explaining Recursive functions

**Tutorial 11:** Pointers, structures and dynamic memory allocation

**Lab 11:** write a program using Pointers and structures

**Tutorial 12:** File handling:

**Lab 12:** Write a program explaining basic File operations.

**Course Outcomes:**

1. To formulate the algorithms for simple problems
2. To translate given algorithms to a working and correct program To be able to correct syntax errors as reported by the compilers
3. To be able to identify and correct logical errors encountered at run time
4. To be able to write iterative as well as recursive programs
5. To be able to represent data in arrays, strings and structures and manipulate them through a program
6. To be able to declare pointers of different types and use them in defining self-referential structures.
7. To be able to create, read and write to and from simple text files.

Note:

1. At least 10 experiments are to be performed by students in the semester.
2. At least 8 experiments should be performed from the above list; remaining two experiments may either be performed from the above list or designed and set by the Dept. as per the scope of the syllabus.

**Course Code:** BT MAT 119B
**Category:** Basic Science Course
**Course Title:** Mathematics-II
**B.Tech. (Computer Science & Engg.) Semester-II**

| L | T | P | |
|---|---|---|---|
| 3 | 1 | 0 | (4 Credits) |

| | |
|---|---|
| Marks for External Exam | : 70 |
| Marks for Internal Exam | : 30 |
| Total | : 100 |
| Duration of Exam | : 3 Hours |

**Course Objectives:**

1. To give adequate exposure of basics of Engineering Mathematics so as to enable them to visualize engineering problems by using Mathematical tools and to support their subsequent engineering studies
2. To familiarize with the uses of measure of dispersion and central tendency.
3. To equip with various types of Probability distributions.
4. To familiarize the analysis of statistical data using various distributions.
5. To form a specific relation for the given data using Principle of least square method.

**UNIT 1**

Central tendency: Mean, Mode , Median, Geometric mean, variance, standard deviation, Moments, skewness and Kurtosis;

Basic Probability: Probability spaces, conditional probability, independence, Bayes theorem; Discrete random variables, Independent random variables.

**UNIT 2**

Expectation of discrete random variables, Correlation coefficient and rank of correlation coefficient, Chebyshev's Inequality.

Discrete probability distribution: Uniform distribution, Binomial distribution, Poisson distribution, evaluation of statistical parameters for these distributions.

**UNIT 3**

Continuous random variables and their properties, distribution functions and densities, normal, exponential and gamma distributions. Bivariate Distributions: Bivariate distributions and their properties, distribution of sums and quotients, conditional densities.

Curve fitting by the method of least squares- fitting of straight lines, second degree parabolas and more general curves.

**UNIT 4**

Test of significance: Large sample test for single proportion, difference of proportions, single mean, difference of means, and difference of standard deviations. Small Sample: Test for single mean, difference of means and correlation coefficients, test for ratio of variances - Chi-square test for goodness of fit and independence of attributes.

**Text Books:**

[1] S. M. Ross, *Introduction to Probability and Statistics for Engineers and Scientists*, 5 edition. Amsterdam ; Boston: Academic Press, 2014.

[2] R. E. Walpole, R. H. Myers, S. L. Myers, and K. E. Ye, *Probability and Statistics for Engineers and Scientists*, 9 edition. Pearson, 2014.

[3] S. C. Gupta and Kapoor, *Fundamentals of Mathematical Statistics*. New Delhi: Sultan Chand & Sons, 2014.

[4] J. S. Milton and J. Arnold, *Introduction to Probability and Statistics: Principles and Applications for Engineering and the Computing Sciences*. 4 edition. New Delhi; New York: McGraw Hill Education, 2017.

**Reference Books:**

[1] D. Wackerly, W. Mendenhall, and R. L. Scheaffer, *Mathematical Statistics with Applications*, 7 edition. Belmont, CA: Thomson Brooks/Cole, 2008.

[2] P. G. Hoel, *Introduction to Mathematical Statistics*, 5 edition. New York: Wiley, 1984.

[3] H. J. Larson, *Introduction to Probability Theory and Statistical Inference*, 3 edition. New York: John Wiley & Sons, 1982.

**Course Outcomes:**

1. The students will be able to apply the concepts of Central tendency in practical work.
2. The students will learn the concept of probability, probability distribution.
3. The students will understand and apply the concept of curve fitting
4. They will be to understood the concept related to , hypothesis tests and bivariate distributions techniques in engineering problems.

**Note:**

1. The paper setter will set a first compulsory question comprising of 6 to 10 sub parts (short questions), covering the entire syllabus and two questions (with/without parts) from each unit. The examinee will attempt five questions in all, along with the compulsory question (with all it sub parts), selecting one question from each unit. All Questions will carry equal marks i.e. 14 marks each.
2. The use of programmable devices such as programmable calculators etc. is not allowed during the exam. Sharing of materials will not be permitted during examination.



**B.Tech. Semester-II**
**(Common for all Branches except CSE)**

**Course Title: Mathematics-II**

**Course Code: BT MAT 120B**

**B. Tech. Semester – III (Common for all Branches except Bio-tech. & CSE)**

| L | T | P | Credits |
|---|---|---|---|
| 3 | 1 | 0 | 4 |

| | | |
|---|---|---|
| Class Work | : | 30 Marks |
| Examination | : | 70 Marks |
| Total | : | 100 Marks |
| Duration of Examination | : | 3 Hours |

**Course objectives:**
1. To familiarize the students with techniques in multivariate integration, ordinary and partial differential equations and complex variables.
2. To equip the students to deal with advanced level of mathematics and applications that would be essential for their disciplines.

**Course objectives:**
1. To familiarize the students with techniques in multivariate integration, ordinary and partial differential equations and complex variables.
2. To equip the students to deal with advanced level of mathematics and applications that would be essential for their disciplines.

**Unit-I**
Multiple Integration: Double integrals, change of order of integration, Triple integral and application, Change of variables, Applications to areas and volumes.

**Unit II**
Vector Calculus: Gradient, Directional derivative, curl and divergence. Vector line integrals, surface integrals, Volume integral Theorems of Green, Gauss and Stokes.

**Unit III**
Ordinary differential Equations of first order and first degree: Exact, Reducible to Exact, linear and Bernoulli's equations. Linear differential Equations of higher order with constant coefficients. Cauchy –Euler Differential Equation, Legendre Linear Equation, Method of variation of parameters, Method of undetermined coefficient. Application of ordinary differential equations.

**Unit IV**
Function of complex variable, analytic functions, Cauchy-Riemann equations, harmonic functions, finding harmonic conjugate; elementary analytic functions (exponential, trigonometric, logarithm) and their properties; Contour integrals, Cauchy-Goursat theorem (without proof), Cauchy Integral formula (without proof), Taylor's series, Laurent's series; zeros of analytic functions, singularities, Residues, Cauchy Residue theorem (without proof), Evaluation of definite integral.

**Course outcomes:**
1. The students will learn evaluating multiple integrals and apply it in calculating area and volumes.
2 They will solve first and second order differentiation equations.
3 They are familiar with analytical functions and their applications.
4. The students will know the concepts of singularity and residue and apply these concepts in evaluating definite integrals

**Text Books:**

[1] E. Kreyszig, Advanced Engineering Mathematics, 10 edition. Hoboken, NJ: Wiley, 2011.
[2] B. Ramana, Higher Engineering Mathematics, 1st edition. New Delhi: McGraw Hill Education, 2017.
[3] B. S. Grewal, Higher Engineering Mathematics 44th Edition. Khanna Publishers, 2017.
[4] R. K. Jain and S. R. K. Iyengar, Advanced Engineering Mathematics 4/e ), Fourth edition edition. Oxford: Narosa Publishing House Pvt. Ltd. - New Delhi, 2012.

**Reference Books:**

[1] J. R. Hass, C. E. Heil, and M. D. Weir, Thomas' Calculus, 14 edition. Boston? Pearson, 2017.
[2] P. S. Das and C. Vijayakumari, Engineering Mathematics, First edition. Place of publication not identified: Pearson Education, 2017.
[3] J. Bird, Higher Engineering Mathematics, 7th ed, 7 edition. Abingdon, Oxon ; New York, NY: Routledge, 2014.
[4] T. Veerarajan, Engineering Mathematics. McGraw Hill Education India Pvt Ltd, 2007.

**Note:**

1. The paper setter will set a first compulsory question comprising of 6 to 10 sub parts (short questions), covering the entire syllabus and two questions (with/without parts) from each unit. The examinee will attempt five questions in all, along with the compulsory question (with all it sub parts), selecting one question from each unit. All Questions will carry equal marks i.e. 14 marks each.

2. The use of programmable devices such as programmable calculators etc. is not allowed during the exam. Sharing of materials will not be permitted during examination.

CENTRAL UNIVERSITY OF HARYANA, MAHENDERGARH

SCHOOL OF ENGINEERING AND TECHNOLOGY

Proceedings / Minutes of the Meeting
of School Board Held on 13.02.2019

The meeting of the School Board of School of Engineering and Technology was held on 13.02.2019. The following were present

1. Dr. Ajay Kumar Bansal, Dean, SOET- Chairman
2. Prof. D. V. S. Verma (Retd.), NIT, Kurukshetra- Member
3. Prof. Anjan Kumar Baral, Professor, GJUST, Hisar- Member
4. Dr. Vikas Garg,HOD, Civil Engg.- Member
5. Dr. Rajesh Kumar Dubey, Associate Professor, CUH- Member
6. Dr. Munish Manas, Assistant Professor, CUH- Member
7. Ms. Ekta Kumari, Assistant Professor, CUH- Member
8. Mr. Deepak Rana, Assistant Professor, CUH- Member
9. Mr. Tarun Singh, Assistant Professor, CUH- Member
10. Dr. Phool Singh, Associate Professor, CUH- Special Invitee
11. Dr. Kalpana Chauhan, Associate Professor, CUH- Special Invitee

Prof. B. R. Chahar, Dr. J. S. Saini and Dr. N. K. Jain, Subject Expert- Member could not attend the meeting due to prior engagements.

After deliberations, it was resolved/ recommended by the School Board as follows:

1. The Scheme of Studies & Examinations and the Syllabi of B.Tech. (Electrical Engg.)- II year (3rd and 4th semesters) approved by BOS, Electrical Engineering were discussed and approved for the Batch 2018-19 onwards (Annexure-1).

2. The Scheme of Studies & Examinations and the Syllabi of B.Tech. (Civil Engg.)- II year (3rd and 4th semesters) approved by BOS, Civil Engineering were discussed and approved for the Batch 2018-19 onwards (Annexure-2).

3. The Scheme of Studies & Examinations and the Syllabi of B.Tech. (Printing and Packaging Technology)- II year (3rd and 4th semesters) approved by BOS, PPT were discussed and approved for the Batch 2018-19 onwards (Annexure-3).

4. The Scheme of Studies & Examinations and the Syllabi of B.Tech. (Computer Science Engg.)- II year (3rd and 4th semesters) approved by BOS, Computer Science Engineering (Through mail) were discussed and approved for the Batch 2018-19 onwards (Annexure-4).

5. The Scheme of Studies & Examinations and the Syllabi of B.Tech. (common for All branches)- I year (1st and 2nd semesters) approved by various BOS were discussed and approved for the Batch 2019-20 onwards (Annexure-5).

The meeting ended with vote of thanks to the Chair.

13/02/2019

Ms. Ekta Kumari

Mr. Tarun Singh

Mr. Deepak Rana

Dr. Kalpana Chauhan

Dr. Munish Manga

Dr. Phool Singh

Dr. Rajesh Kumar Dubey

Dr. Vikas Garg

Dr. A. K. Baral

Prof. D. V. S. Verma

Dr. Ajay Kumar Bansal

Annexure - I

**DEPT. OF ELECTRICAL ENGG.**
**CENTRAL UNIVERSITY OF HARYANA, MAHENDERGARH**

Proceedings / Minutes of the Meeting
of Board of Studies in Electrical Engg. Held on 11.02.2019

The meeting of the Board of Studies in Electrical Engg. was held on 11.02.2019. The following were present:

1. Dr. Ajay Kumar Bansal, HOD, EE- Chairperson
2. Dr. J.S. Saini, Subject Expert- Member
3. Dr. Rajesh Kumar Dubey, Associate Professor, CUH- Member
4. Dr. Munish Manas, Assistant Professor, CUH- Member
5. Sh. Rajesh Saini, Assistant Professor, CUH- Special Invitee
6. Dr. Manish Kumar, Assistant Professor, CUH- Special Invitee

Dr. Ashwani Kumar, Subject Expert- Member could not attend the meeting due to prior engagements.

After deliberations, it was resolved/ recommended by the Board of Studies as follows:

1. The Scheme of Studies & Examinations and the Syllabi of B.Tech. (Electrical Engg.)- II year (3rd and 4th semesters) were discussed and approved for the Batch 2018-19 onwards (Annexure-1).

2. The Panels of Paper Setters & Examiners of end-term examinations (Annexure-2, 3 & 4) are approved for B.Tech. 2nd Sem. (common to all branches), 4th Sem. B.Tech. (Electrical Engg.) and 6th Sem. B.Tech. (Electrical Engg.).

The meeting ended with vote of thanks to the Chair.

11/2/19
Dr. Manish Kumar

11/02/19
Sh. Rajesh Saini

11/02/19
D. Munish Manas

11/2/2019
Prof. J.S. Saini

11/02/2019
Dr. Rajesh Kumar Dubey

11/2/2019
Dr. Ajay Kumar Bansal

Annexure-2

# Scheme of Studies & Examination and Syllabi for B.Tech. in Electrical Engineering according to Choice Based Credit System (CBCS)

## (Semester-III to Semester-IV)

## Department of Electrical Engineering
## For Session 2019-20 onwards
[3rd Batch onwards]

## School of Engineering & Technology

## CENTRAL UNIVERSITY OF HARYANA
## MAHENDERGARH-123031
## HARYANA

**Central University of Haryana, Mahhendergarh**
**B.Tech. 2nd YEAR (SEMESTER – III)**
**Choice Based Credit System Scheme Of Studies & Examinations w.e.f. 2019-20**
**(Batch 2018-19 onwards)**

| Sl. No. | Course Code | Course Title | Teaching Schedule | | | Marks of Class work | Examination Marks | | Total | Credits | Duration of Exam |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | L | T | P | | Theory | Practical | | | |
| 1 | BT EE301A | Electrical Circuit Analysis | 3 | 1 | 0 | 30 | 70 | 0 | 100 | 4 | 3 |
| 2 | BT EE302A | Semiconductor Devices and Circuits | 3 | 1 | 0 | 30 | 70 | 0 | 100 | 4 | 3 |
| 3 | BT EE303A | Semiconductor Devices and Circuits Laboratory | 0 | 0 | 2 | 30 | 0 | 70 | 100 | 1 | 3 |
| 4 | BT EE304A | Electrical Machines-I | 3 | 1 | 0 | 30 | 70 | 0 | 100 | 4 | 3 |
| 5 | BT EE305A | Electrical Machines Laboratory-I | 0 | 0 | 2 | 30 | 0 | 70 | 100 | 1 | 3 |
| 6 | BT EE306A | Measurements and Instrumentation | 3 | 0 | 0 | 30 | 70 | 0 | 100 | 3 | 3 |
| 7 | BT EE307A | Measurements and Instrumentation Laboratory | 0 | 0 | 2 | 30 | 0 | 70 | 100 | 1 | 3 |
| 8 | | GEC | 3 | 1 | 0 | 30 | 70 | 0 | 100 | 4 | 3 |
| 9 | BT AUD 308A | Environment Studies | 3 | 0 | 0 | 30 | 70 | 0 | 100 | 0 | 3 |
| **Total** | | | **18** | **04** | **06** | **270** | **420** | **210** | **900** | **22** | **27** |

**L = Lecture, T = Tutorial, P = Practical, AUD = Audit Course, & C = Credits, GEC= Generic Elective Course**

**NOTE**: - 1. Examinees will be allowed to use only non-programmable scientific calculators in the examination. Other electronic gadgets and sharing of materials will not be permitted during the examinations.

2. GEC to be taken from other department.

**Central University of Haryana, Mahhendergarh**
**B.Tech. 2nd YEAR (SEMESTER – IV)**
**Choice Based Credit System Scheme Of Studies & Examinations w.e.f. 2019-20**
**(Batch 2018-19 onwards)**

| Sl. No. | Course Code | Course Title | Teaching Schedule | | | Marks of Class work | Examination Marks | | Total | Credits | Duration of Exam |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | L | T | P | | Theory | Practical | | | |
| 1 | BT EE401A | Logic and Sequential Circuits | 3 | 1 | 0 | 30 | 70 | 0 | 100 | 4 | 3 |
| 2 | BT EE402A | Logic and Sequential Circuits Laboratory | 0 | 0 | 2 | 30 | 0 | 70 | 100 | 1 | 3 |
| 3 | BT EE403A | Electrical Machines – II | 3 | 1 | 0 | 30 | 70 | 0 | 100 | 4 | 3 |
| 4 | BT EE404A | Electrical Machines Laboratory - II | 0 | 0 | 2 | 30 | 0 | 70 | 100 | 1 | 3 |
| 5 | BT EE405A | Power Systems – I (Apparatus and Modelling) | 3 | 0 | 0 | 30 | 70 | 0 | 100 | 3 | 3 |
| 6 | BT EE406A | Power Systems Laboratory - I | 0 | 0 | 2 | 30 | 0 | 70 | 100 | 1 | 3 |
| 7 | BT EE407A | Signals and Systems | 3 | 0 | 0 | 30 | 70 | 0 | 100 | 3 | 3 |
| 8 | BT EE408A | Mathematics – III (Probability and Statistics) | 3 | 1 | 0 | 30 | 70 | 0 | 100 | 4 | 3 |
| 9 | | GEC | 3 | 1 | 0 | 30 | 70 | 0 | 100 | 4 | 3 |
| 10 | BT AUD 409A | Indian Constitution | 3 | 0 | 0 | 30 | 70 | 0 | 100 | 0 | 3 |
| **Total** | | | **21** | **03** | **06** | **250** | **525** | **225** | **1000** | **25** | **30** |

**NOTE**: - 1. Examinees will be allowed to use only non-programmable scientific calculators in the examination. Other electronic gadgets and sharing of materials will not be permitted during the examinations.
2. GEC to be taken from other department

BT EE 301A

# Electrical Circuit Analysis

## B.TECH. (ELECTRICAL ENGINEERING)
## SEMESTER-III

| L | T | P | Credits |
|---|---|---|---|
| 3 | 1 | - | 4 |

Class-work Marks: 30
Exam Marks: 70
Total Marks: 100
Duration of Examination: 3 Hrs

**Course Outcomes**:

At the end of this course, students will demonstrate the ability to

1. Apply network theorems for the analysis of electrical circuits.
2. Obtain the transient and steady-state response of electrical circuits.
3. Analyse circuits in the sinusoidal steady-state (single-phase and three-phase).
4. Analyse two port circuit behaviour.
5.

### UNIT-I

**Network Theorems (10 Hours)**

Superposition theorem, Thevenin theorem, Norton theorem, Maximum power transfer theorem, Reciprocity theorem, Compensation theorem. Analysis with dependent current and voltage sources. Node and Mesh Analysis. Concept of duality and dual networks.

**Solution of First and Second order networks (6 Hours)**

Solution of first and second order differential equations for Series and parallel R-L, R-C, R-L-C circuits, initial and final conditions in network elements, forced and free response, time constants, steady state and transient state response.

### UNIT-II

**Sinusoidal steady state analysis (8 Hours)**

Representation of sine function as rotating phasor, phasor diagrams, impedances and admittances, AC circuit analysis, effective or RMS values, average power and complex power, series and parallel resonances, Three-phase circuits, Mutual coupled circuits, Dot Convention in coupled circuits, Ideal Transformer.

### UNIT-III

**Electrical Circuit Analysis Using Laplace Transforms (6 Hours)**

Review of Laplace Transform, Analysis of electrical circuits using Laplace Transform for standard inputs, inverse Laplace transform, transformed network with initial conditions, Transfer function representation, Poles and Zeros, Frequency response (magnitude and phase plots),

**Graph Theory (4 Hours)**

Definition, Graph, Tree, Basic cut- set & tie-set matrices for planer networks-loop and nodal method of analysis of networks with independent and dependent Voltage & current source, Duality & dual networks.

### UNIT-IV

**Two Port Network and Network Functions (6 Hours)**

Two Port Networks, terminal pairs, relationship of two port variables, impedance parameters, admittance parameters, transmission parameters and hybrid parameters, interconnections of two port networks.

**Text / References:**

1. M. E. Van Valkenburg, "Network Analysis", Prentice Hall, 2006.
2. D. Roy Choudhury, "Networks and Systems", New Age International Publications, 1998.
3. W. H. Hayt and J. E. Kemmerly, "Engineering Circuit Analysis", McGraw Hill Education, 2013.
4. C. K. Alexander and M. N. O. Sadiku, "Electric Circuits", McGraw Hill Education, 2004.
5. K. V. V. Murthy and M. S. Kamath, "Basic Circuit Analysis", Jaico Publishers, 1999.

**Note:**

1. The paper setter will set two questions (with/without parts) from each unit, and a ninth compulsory question comprising of 6 to 10 sub parts (short questions), covering the entire syllabus. The examinee will attempt five questions in all, along with the compulsory question (with all it sub parts), selecting one question from each unit.
2. Examinees will be allowed to use only non-programmable scientific calculators in the examination. Other electronic gadgets and sharing of materials will not be permitted during the examinations.

BT EE302A **Semiconductor Devices and Circuits**

**B.TECH. (ELECTRICAL ENGINEERING)**
**SEMESTER-III**

| L | T | P | Credits |
|---|---|---|---|
| 3 | 1 | - | 4 |

Class-work Marks: 30
Exam Marks: 70
Total Marks: 100
Duration of Examination: 3 Hrs

**Course Objectives:**

1. To make the students understand, analyze and comprehend the electronic devices.

**Course Outcomes:**

At the end of this course, students will demonstrate the ability to

1. Understand the characteristics of transistors.
2. Design and analyse various rectifier and amplifier circuits.
3. Design sinusoidal and non-sinusoidal oscillators.
4. Understand the functioning of OP-AMP and design OP-AMP based circuits.

**UNIT-I**

**Diode circuits (4 Hours)**
P-N junction diode, I-V characteristics of a diode; review of half-wave and full-wave rectifiers, Zener diodes, clamping and clipping circuits.

**BJT circuits (8 Hours)**
Structure and I-V characteristics of a BJT; BJT as a switch. BJT as an amplifier: small-signal model, biasing circuits, common-emitter, common-base and common-collector amplifiers; Small signal equivalent circuits, high-frequency equivalent circuits, feedback amplifiers.

**UNIT-II**

**MOSFET circuits (8 Hours)**
MOSFET structure and I-V characteristics, MOSFET as a switch. MOSFET as an amplifier: small-signal model and biasing circuits, common-source, common-gate and common-drain amplifiers; small signal equivalent circuits - gain, input and output impedances, trans-conductance, high frequency equivalent circuit.

**UNIT-III**

**Differential, multi-stage and operational amplifiers (8 Hours)**
Differential amplifier; power amplifier; direct coupled multi-stage amplifier; internal structure of an operational amplifier, ideal op-amp, non-idealities in an op-amp (Output offset voltage, input bias current, input offset current, slew rate, gain bandwidth product)

**UNIT-IV**

**Linear applications of op-amp (8 Hours)**
Idealized analysis of op-amp circuits. Inverting and non-inverting amplifier, differential amplifier, instrumentation amplifier, integrator, active filter, voltage regulator, oscillators (Wein bridge and phase shift). Analog to Digital Conversion.

**Nonlinear applications of op-amp (6 Hours)**
Hysteretic Comparator, Zero Crossing Detector, Square-wave and triangular-wave generators, peak detector.

**Text/References:**

1. A. S. Sedra and K. C. Smith, "Microelectronic Circuits", New York, Oxford University Press, 1998.
2. J. V. Wait, L. P. Huelsman and G. A. Korn, "Introduction to Operational Amplifier theory and applications", McGraw Hill U. S., 1992.
3. J. Millman and A. Grabel, "Microelectronics", McGraw Hill Education, 1988.
4. P. Horowitz and W. Hill, "The Art of Electronics", Cambridge University Press, 1989.
5. P.R. Gray, R.G. Meyer and S. Lewis, "Analysis and Design of Analog Integrated Circuits", John Wiley & Sons, 2001.

**Note:**

1. The paper setter will set two questions (with/without parts) from each unit, and a ninth compulsory question comprising of 6 to 10 sub parts (short questions), covering the entire syllabus. The examinee will attempt five questions in all, along with the compulsory question (with all it sub parts), selecting one question from each unit.
2. Examinees will be allowed to use only non-programmable scientific calculators in the examination. Other electronic gadgets and sharing of materials will not be permitted during the examinations.

BT EE303A **Semiconductor Devices and Circuits Laboratory**

**B.TECH. (ELECTRICAL ENGINEERING)**
**SEMESTER-III**

| P | Credits |
|---|---|
| 2 | 1 |

Class-work Marks: 30
Exam Marks: 70
Total Marks: 100
Duration of Examination: 3 Hrs

**COURSE OBJECTIVE:**

1. To evaluate performance characteristics of diodes, transistors, JFETs, and op-amps.
2. To have a deeper knowledge about various configuration of transistors.

**LIST OF EXPERIMENTS:**

1 To perform of half wave and full wave rectifier operation & to plot their waveforms.
2 Study of power supply filter.
3 To use diode as a clipper and clamper.
4 To use of zener diode as a voltage regulator.
5 To use CE amplifier for voltage, current and Power gains input, output impedances. .
6 To use of CC amplifier as a buffer.
7 To plot the frequency response of RC coupled amplifier.
8 To use of transistor as a constant current source in CE configuration .
9 To study characteristics of FET.
10 To use of FET common source amplifier.
11 To use of FET common drain amplifier.
12 Graphical determination of small signal hybrid parameter of bipolar junction transistor.
13 Study and design of a DC voltage doubler.

**COURSE OUTCOMES:**

Through this course, the students:

1. Acquire a basic knowledge in solid state electronics including diodes, MOSFET, BJT, and operational amplifier.
2. Develop the ability to analyze and design analog electronic circuits using discrete components.
3. Observe the amplitude and frequency responses of common amplification circuits.
4. Design, construct, and take measurement of various analog circuits to compare experimental results in the laboratory with theoretical analysis.

**Note:**

1. At least 8 experiments are to be performed by students in the semester.
2. At least 6 experiments should be performed from the above list; remaining two experiments may either be performed from the above list or designed and set by the Dept. as per the scope of the syllabus.

BT EE304A

**Electrical Machine -I**
**B.TECH. (ELECTRICAL ENGINEERING)**
**SEMESTER-III**

| L | T | Credits |
|---|---|---|
| 3 | 1 | 4 |

Class-work Marks: 30
Exam Marks: 70
Total Marks: 100
Duration of Examination: 3 Hrs

**Course Objectives:**
This subject aims to introduce to students to give detailed knowledge of magnetic field & magnetic circuits, DC Machines, 1-Phase and 3-Phase transformers.

**Course Outcomes:**
At the end of this course, students will demonstrate the ability to
- Understand the concepts of magnetic circuits.
- Understand the operation of dc machines.
- Analyse the differences in operation of different dc machine configurations.
- Analyse single phase and three phase transformers circuits.

## Unit-I

**Magnetic fields and magnetic circuits (5 Hours):**
Review of magnetic circuits - MMF, flux, reluctance, inductance; Visualization of magnetic fields produced by a current carrying coil - through air and through a combination of iron and air; influence of highly permeable materials on the magnetic flux lines.

**Electromagnetic force and torque (6 Hours):**
B-H curve of magnetic materials; flux-linkage vs current characteristic of magnetic circuits; linear and nonlinear magnetic circuits; energy stored in the magnetic circuit; force as a partial derivative of stored energy with respect to position of a moving element; torque as a partial derivative of stored energy with respect to angular position of a rotating element. Singly and doubly excited electromagnetic system

## Unit-II

**DC Machines (10 Hours):**
Basic construction of a DC machine, magnetic structure - stator yoke, stator poles, pole-faces or shoes, air gap and armature core, visualization of magnetic field produced by the field winding excitation with armature winding open, air gap flux density distribution, flux per pole, induced EMF in an armature coil. Armature winding and commutation - Elementary armature coil and commutator, lap and wave windings, construction of commutator, linear commutation, Derivation of back EMF equation, armature MMF wave, derivation of torque equation, armature reaction, air gap flux density distribution with armature reaction.
Types of field excitations - separately excited, shunt and series. Open circuit characteristic of separately excited DC generator, back EMF with armature reaction, voltage building up in a separately excited generator, critical field resistance and critical speed, V-I characteristics and torque-speed characteristics of separately excited, shunt and series motors.

## Unit-III

**DC machine (4 Hours):**
Starting, braking and speed control of DC motors. Losses, load testing and back-to-back testing of DC machines.

**Transformers (6 Hours):**
Principle, construction and operation of single-phase transformers, equivalent circuit, phasor diagram, voltage regulation, losses and efficiency Testing - open circuit and short circuit tests, polarity test, back-to-back test, separation of hysteresis and eddy current losses.

## Unit-IV

**Transformers (10 Hours):**
Autotransformers - construction, principle, applications and comparison with two winding transformer, Magnetizing current, effect of nonlinear B-H curve of magnetic core material, harmonics in magnetization current, Phase conversion - Scott connection, three-phase to six-phase conversion, Tap-changing transformers - No-load and on-load tap-changing of transformers, Three-winding transformers, Cooling of transformers, Three-phase transformer-construction, types of connection and their comparative features, Parallel operation of single-phase and three-phase transformers.

Text / References


1. A. E. Fitzgerald and C. Kingsley, "Electric Machinery", New York, McGraw Hill Education, 2013.
2. A. E. Clayton and N. N. Hancock, "Performance and design of DC machines", CBS Publishers, 2004.
3. M. G. Say, "Performance and design of AC machines", CBS Publishers, 2002.
4. P. S. Bimbhra, "Electrical Machinery", Khanna Publishers, 2011.
5. I. J. Nagrath and D. P. Kothari, "Electric Machines", McGraw Hill Education, 2010.


**Note:**

1. The paper setter will set two questions (with/without parts) from each unit, and a ninth compulsory question comprising of 6 to 10 sub parts (short questions), covering the entire syllabus. The examinee will attempt five questions in all, along with the compulsory question (with all it sub parts), selecting one question from each unit.
2. Examinees will be allowed to use only non-programmable scientific calculators in the examination. Other electronic gadgets and sharing of materials will not be permitted during the examinations.

**BT EE305A** **Electrical Machine-I Laboratory**

B.TECH. (ELECTRICAL ENGINEERING)
SEMESTER-III

| P | Credits | Class-work Marks: 30 |
|---|---|---|
| 2 | 1 | Exam Marks: 70 |
| | | Total Marks: 100 |
| | | Duration of Examination: 3 Hrs |

LIST OF EXPERIMENT

1. To perform load test on DC shunt motor and determine performance characteristics
2. To perform load test on DC shunt generator.
3. To determine efficiency of DC shunt Machine by Hopkinson's test.
4. To perform speed control of DC shunt motor by field control and armature control method.
5. To perform Ward Leonard method of speed control of D.C. motor.
6. To find turns ratio & polarity of a 1-phase transformer.
7. To perform open & short circuit tests on a 1-phase transformer, and determine transformer parameter and efficiency at different loads.
8. To separate the hysteresis and eddy current losses of a Transformer.
9. To perform Sumpner's back to back test on 1-phase transformers.
10. To perform Parallel operation of two 1-phase transformers.
11. To perform Parallel operation of two 3-phase transformers.
12. To convert three phase to two-phase By Scott-connection.

**Note:**

1. At least 8 experiments are to be performed by students in the semester.
2. At least 6 experiments should be performed from the above list; remaining two experiments may either be performed from the above list or designed and set by the Dept. as per the scope of the syllabus.

BT EE306A MEASUREMENTS AND INSTRUMENTATION

B.TECH. (ELECTRICAL ENGINEERING)
SEMESTER-III

| L | T | P | Credits |
|---|---|---|---|
| 3 | 0 | - | 3 |

Class-work Marks: 30
Exam Marks: 70
Total Marks: 100
Duration of Examination: 3 Hrs

**COURSE OUTCOMES:**

At the end of this course, the students will be able to:

1. Learn about various measurement instruments for measurement of Voltage, Current, Power, Power Factor & Frequency, their construction, operating principle, limitations, etc.;
2. Understand statistical data analysis& errors in instruments;
3. Analyse the static characteristics of instruments
4. Understand the measurement of parameters & variables with the help of D.C. & A.C. bridges.

## UNIT- I

**Fundamental Concepts Relating to Measurements:** Standards, True Value, Static Characteristic of Instruments (Accuracy, Precision, Resolution, Threshold, Sensitivity, Drift, Hysteresis & Dead-band, Dead Time); Classification of Instruments (Absolute & Secondary Instruments; Indicating, Recording & Integrating instruments); Generalized Instrument (Block diagram, description of blocks); Three torque in Electromechanical indicating instruments; Comparison of damping methods & their suitability; Scale information.

Errors in Measurements (Gross, Systematic, Random); Basic statistical analysis applied to measurements: Mean, standard deviation, Six-sigma estimation, $C_p$, $C_{pk}$.

## UNIT- II

**MEASURING INSTRUMENTS FOR VOLTAGE & CURRENT:** Construction, Operating Principle, torque equation, Shape of scale, use as Ammeter or as Voltmeter (Extension of Range), Use on AC/DC or both, Advantages & disadvantages, Errors (Both on AC/DC) of PMMC types, Electrodynamic Type, Moving iron type (attraction, repulsion & combined types), & Induction type instruments

## UNIT- III

**WATTMETERS & ENEGRY METERS:** Construction, operating principle, Torque equation, Shape of scale, Errors, Advantages & Disadvantages of Electrodynamic & Induction type Wattmeters; Single phase induction type Energy meter, Compensation & creep in energy meter.

**POWER FACTOR & FREQUENCY METERS:** Construction, operation, principle, Torque equation, Advantages & disadvantages of Single phase power factor meters (Electrodynamic & Moving Iron types) & Frequency meters (Electrical Resonance Type: Ferrodynamic & Electrodynamic types).

## UNIT- IV

**MEASUREMENT OF RESISTANCES (MEDIUM, LOW & HIGH):** Voltmeter-ammeter method & Substitution Method for medium range resistance measurement; Limitations of Wheatstone bridge; Four-terminal resistance; Kelvin's double bridge method for low resistance measurement, Difficulties in high resistance measurements; Measurement of high resistance by direct deflection & loss of charge methods, Meggar.

**MEASUREMENT OF INDUCTANCE (L), CAPACITANCE (C) & FREQUENCY BY A.C. BRIDGES:** General balance equation, Circuit diagram, Phasor diagram, Advantages, disadvantages, applications of Maxwell's inductance-capacitance, Hays, Owens, Schering, De Sauty & Wein's bridges.

**TEXT BOOK:**

1. Measurements & Instrumentation by J.S. Saini; New Age Pub., N. Delhi

**REFERENCE BOOKS:**

1. A Course in Elect. & Electronic Measurements & Instrumentation by A. K. Sawhney; Khanna Pub.
2. Electrical Measurements by E.W. Golding & F.C. Widdis; Pub.: Reem Publications
3. Electronic & Elect. Measurement & Instrumentation by J.B. Gupta; Pub.: Kataria & Sons.
4. Electronic Instrumentation & Measurement Technique, W.D. Cooper & A.D. Helfrick; Pub.: Prentice Hall
5. Measuring Systems by Ernest O. Doebelin & Dhanesh N. Manik; Pub.: McGraw Hill.

**Note:**

1. The paper setter will set two questions (with/without parts) from each unit, and a ninth compulsory question comprising of 6 to 10 sub parts (short questions), covering the entire syllabus. The examinee will attempt five questions in all, along with the compulsory question (with all it sub parts), selecting one question from each unit.
2. Examinees will be allowed to use only non-programmable scientific calculators in the examination. Other electronic gadgets and sharing of materials will not be permitted during the examinations.

## BT EE307A MEASUREMENTS AND INSTRUMENTATION Laboratory

### B.TECH. (ELECTRICAL ENGINEERING)
### SEMESTER-III

| P | Credits | Class-work Marks: 30 |
|---|---|---|
| 2 | 1 | Exam Marks: 70 |
| | | Total Marks: 100 |
| | | Duration of Examination: 3 Hrs |

**COURSE OUTCOMES:**

At the end of this Laboratory course, the students will be able to have hands on experience of:

1. Various measuring instruments;
2. Understanding statistical data analysis & errors in instruments;
3. Measurement of power and power factor using different techniques;
4. Measurement of parameters & variables with the help of D.C. & A.C. bridges;
5. Storage & retrieval of waveforms/ data to & from DSO and computations therefrom.

### LIST OF EXPERIMENTS

1. To measure the resistances of a batch of resistors (same-value by specifications) and estimate their statistical parameters (mean & standard deviation).
2. To measure inductance (L) by Maxwell's bridge and by an LCR meter.
3. To measure capacitance (C) by De-Sauty's bridge and by an LCR meter.
4. To measure frequency (f) by Wien's bridge.
5. To measure resistance of a four-terminal Low Resistance using Kelvin's double bridge.
6. To measure High resistance and Insulation resistance using Megger.
7. To use DSO for storage and retrieval of steady state periodic waveforms produced by a function generator. Consider selection of trigger source and trigger level, selection of time scale and voltage scale. Also alter bandwidth of measurement and sampling rate & record observations.
8. To Store & Retrieve one cycle of data of a periodic waveform from a DSO and use the values of data to compute RMS values using C or MATLAB program.
9. To use DSO to capture transients like step response of R-L-C circuit.
10. To effect current measurement using Shunt, C.T., and Hall sensor.
11. To measure power with the help of Wattmeter, C.T. & P.T.
12. To measure, using 2-wattmeter method, the (a) power in a balanced & an unbalanced 3-phase load (b) p.f. in a balanced 3-phase load.
13. To measure power & p.f. by 3-ammeter method.
14. To measure power & p.f. by 3-voltmeter method.

**Note:**

1. At least 8 experiments are to be performed by students in the semester.
2. At least 6 experiments should be performed from the above list; remaining two experiments may either be performed from the above list or designed and set by the Dept. as per the scope of the syllabus.

**BT AUD308A** **Environment Studies**

**B.TECH. (ELECTRICAL ENGINEERING)**

**SEMESTER-III**

| L | T | P | Credits |
|---|---|---|---|
| 3 | 0 | - | 0 |

Class-work Marks: 30
Exam Marks: 70
Total Marks: 100
Duration of Examination: 3 Hrs

**UNIT – I**

The Multidisciplinary nature of environmental studies, Definition, scope and importance. Natural Resources: Renewable and non-renewable resources: Natural resources and associated problems.

a) Forest resources: Use and over-exploitation: deforestation, case studies, Timber exploitation, mining, dams and their effects and forests tribal people.

b) Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems.

c) Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies.

d) Food resources: World food problems, changes, caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies.

e) Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources; case studies.

f) Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification.

Role of an individual in conservation of natural resources.
Equitable use of resources for sustainable lifestyles.

**UNIT- II**

Ecosystems: Concept of an ecosystem. Structure and function of an ecosystem. Producers, consumers and decomposers. Energy flow in the ecosystem. Ecological succession. Food chains, food webs and ecological pyramids. Introduction, types, characteristic features, structure and function of the following eco-system:

a) Forest ecosystem.
b) Grassland ecosystem.
c) Desert ecosystem.
d) Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries).

**UNIT- III** Biodiversity and its conservations:
Introduction – Definition: Genetic, species and ecosystem diversity.
Biogeographically classification of India. Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values. Biodiversity at global, National and local levels. India as a mega-diversity nation. Hot-spots of biodiversity. Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts. Endangered and endemic species of India.

**UNIT – IV** Environmental Pollution: Definition, causes, effects and control, measures of: a) Air pollution
b) Water pollution

c) Soil pollution
d) Marine pollution
e) Noise pollution
f) Thermal Pollution
g) Nuclear hazards

Solid waste management: Causes effects and control measures of urban and industrial wastes. Role of an individual in prevention of pollution.
Pollution case studies. Disaster management: Floods, earthquake, cyclone and landslides.
Social issues and the Environment:

a) From unsustainable to sustainable development
b) Urban problems related to energy
c) Water conservation, rain water harvesting, watershed management
d) Resettlement and rehabilitation of people; its problems and concerns, case studies
e) Environmental ethics: Issues and possible solutions
f) Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust, Case studies g) Wasteland reclamation

h) Consumerism and waste products

**Text Books:**


1. Bharucha, Franch, The Biodiversity of India, Mapin Publishing Pvt. Ltd., Ahmedabad – 380013, India.
2. Brunner R.C. 1989, Hazardous Waste Incineration, Mc. Graw Hill Inc. 480pp.
3. Clark R.S., Marine Pllution, Slanderson Press Oxford (TB).
4. Cunningham, W.P. Cooper, T.H. Gorhani, E & Hepworth, M.T. 2001, Environmental
5. Encyclopedia, Jaico Pub. House, Mumbai. 1195p.
6. De A.K., Environmenal Chemistry, Wiley Eastern Ltd. Down to Earth, Centre for Science and Environment ®.


**Reference Books:**


1. Gleick, H.P., 1993. Water in Crisis, Pacific Institute for Studies in Dev., Environment & Security, Stockholm Env. Institute, Oxford Univ., Press 473p.
2. Hawkins R.E. Encyclopedia of Indian Natural History, Bomaby Natural History Scociety,
3. Bombay (R).
4. Heywood, V.H. & Watson, R.T. 1995. Global Biodiversity Assessment. Cambridge Univ. Press
5. 1140p.
6. Jadhav, H & Bhosale, V.M. 1995, Environmental Protection and Laws, Himalaya Pub. House, 7. Helhi 284p.
8. Mckinney, M.L. & Schoch, RM 1996, Environmental Sciences Systems & Solutions, Web
9. enhanced Edition 639p

**BT EE401A** **LOGIC AND SEQUENTIAL CIRCUITS**

**B.TECH. (ELECTRICAL ENGINEERING)**
**SEMESTER-IV**

| L | T | P | Credits |
|---|---|---|---|
| 3 | 1 | - | 4 |

Class-work Marks: 30
Exam Marks: 70
Total Marks: 100
Duration of Examination: 3 Hrs

**COURSE OBJECTIVES:**

The main objective of this course is

1. To give the students basic knowledge of the logical operation and digital circuits.
2. Understanding the mathematical operations done in digital circuits.
3. To provide the understanding of data storage.
4. How decision making and other events take place in digital cicuits.

**COURSE OUTCOMES:**

After going through this course, the students shall be able to:

1. Understand working of logic families and logic gates.
2. Design and implement Combinational and Sequential logic circuits.
3. Understand the process of Analog to Digital conversion and Digital to Analog conversion.
4. Be able to use PLDs to implement the given logical problem.

UNIT - 1

**Fundamentals of Digital Systems and logic families**: Digital Signals, Digital Circuits, Logic Symbols and Truth Tables, AND, OR, NOT, NAND, NOR and Exclusive-OR Operations, Universal Gates, Boolean Algebra, Examples of IC Gates, Bases-2, 8, 10 and 16 Number Systems (Binary, Signed Binary, Octal Hexadecimal Number),Conversion from one Base to other Base, Binary Arithmetic, Addition, Subtraction, One's and Two's Complements Arithmetic, Other Binary Codes, Error Detecting and Correcting Codes, Characteristics of Digital ICs, Digital Logic Families, TTL, Schottky TTL and CMOS Logic, Interfacing CMOS and TTL, Tri-State Logic.

(10Hours)

UNIT - 2

**Combinational Digital Circuits**: Standard Representation for Logic Functions, Fundamental Sum of Products and Product of Sum Expressions, K-Map Representation, Simplification of Logic Functions Using K-Map, Minimization of Logical Functions. Don't care Conditions. Common Combinational Logic Circuits, Multiplexer, De-Multiplexer /Decoders, Half Adders, Full Adders, Subtractors, Binary Coded Decimal Arithmetic, Carry Look Ahead Adder, Serial Adder, Digital Comparator, Even and Odd Parity, Parity Checker/Generator, Code Converters, Priority Encoders, Decoders/Drivers for Display Devices, Q-M Method of Function Realization.

(10 Hours)

UNIT - 3

**Sequential Circuits and Systems:** Binary Storage Element, A 1-bit Memory, Circuit Properties of Bi-Stable Latch, Basics of Flip-flop, Flip-Flop Operation and its types, SR and Clocked SR flip flop, J- K-T and D-types Flip-Flops, Applications of Flip-Flops, Introduction to Registers, Shift Registers, Applications of Shift Registers, Serial to Parallel Converter, Parallel to Serial Converter, General form of a Sequential Circuit, Asynchronous and

synchronous Circuits, Sequence Generator, Ripple (Asynchronous) Counters, Synchronous Counters, Counters Design using Flip Flops. (10 Hours)

UNIT - 4

**A/D and D/A Converters**: Digital to Analog Converters: Weighted Resistor/Converter, R-2R Ladder D/A Converter, Specifications for D/A Converters, Examples of D/A Converter ICs. Sample and Hold Circuit, Analog to Digital Converters: Quantization and Encoding, Parallel Comparator A/D Converter, Successive Approximation A/D Converter, Counting A/D Converter, Dual Slope A/D Converter, A/D Converter using Voltage to Frequency and Voltage to Time Conversion, Specifications of A/D Converters, Example of A/D Converter ICs. (10 Hours)

TEXT/REFERENCES:

1. R. P. Jain, "Modern Digital Electronics", McGraw Hill Education, 2009.
2. M. M. Mano, "Digital logic and Computer design", Pearson Education India, 2016.
3. A. Kumar, "Fundamentals of Digital Circuits", Prentice Hall India, 2016.

**Note:**

1. The paper setter will set two questions (with/without parts) from each unit, and a ninth compulsory question comprising of 6 to 10 sub parts (short questions), covering the entire syllabus. The examinee will attempt five questions in all, along with the compulsory question (with all it sub parts), selecting one question from each unit.
2. Examinees will be allowed to use only non-programmable scientific calculators in the examination. Other electronic gadgets and sharing of materials will not be permitted during the examinations.

**BT EE402A** **LOGIC AND SEQUENTIAL CIRCUITS LABORATORY**

**B.TECH. (ELECTRICAL ENGINEERING)**
**SEMESTER-IV**

| L | P | Credits |
|---|---|---|
| 0 | 2 | 1 |

Class-work Marks: 30
Exam Marks: 70
Total Marks: 100
Duration of Examination: 3 Hrs

LIST OF EXPERIMENTS:

1. Study of TTL gates –AND, OR, NOT, NAND, NOR, EX-OR, EX-NOR.
2. To realize the universal property of NAND gate.
3. To realize the universal property of NOR gate.
4. Design & realize a given function using K-maps and verify its performance.
5. To verify the operation of Multiplexer & De-multiplexer.
6. To verify the operation of Comparators.
7. To perform Half adder and Full adder.
8. To perform Half Substractor and Full Substractor.
9. To verify the truth table of S-R, J-K, T & D Type flip flop.
10. To verify the operation of bi-directional shift register.
11. To study analog to digital and digital to analog converter.
12. To design & verify the operation of 3 bits' synchronous counter.
13. To design & verify the operation of synchronous UP/DOWN decade counter using JK flip flop & derive a seven segment display using the same.
14. To design & verify the operation of asynchronous UP/DOWN decade counter using JK flip flop & derive a seven segment display using the same.
15. Design a 4- bit shift register, verify its operation and verify the operation of a ring counter and a Johnson counter.
16. To implement the experiment 1 on NI ELVIS Board.
17. To implement Boolean expression on NI ELVIS Board.

**Note:**

1. At least 8 experiments are to be performed by students in the semester.
2. At least 6 experiments should be performed from the above list; remaining two experiments may either be performed from the above list or designed and set by the Dept. as per the scope of the syllabus.

BT EE403A ELECTRICAL MACHINE -II

B.TECH. (ELECTRICAL ENGINEERING)
SEMESTER-IV

| L | T | P | Credits |
|---|---|---|---|
| 3 | 1 | - | 4 |

Class-work Marks: 30
Exam Marks: 70
Total Marks: 100
Duration of Examination: 3 Hrs

**Course Objectives:**
This subject aims to introduce to students to give detailed knowledge of AC windings, magnetic field, various 1-Phase and 3-Phase A.C machines.

**Course Outcomes:**
At the end of this course, students will demonstrate the ability to
- Understand the concepts of rotating magnetic fields.
- Understand the operation of ac machines.
- Analyse performance characteristics of ac machines.

**Unit-I**

**Fundamentals of AC machine windings (8 Hours):**
Physical arrangement of windings in stator and cylindrical rotor; slots for windings; full-pitch coils, concentrated winding, distributed winding, winding axis, 3D visualization of the above winding types, Air-gap MMF distribution with fixed current through winding-concentrated and distributed, pitch factor and distribution factor

**Pulsating and revolving magnetic fields (4 Hours):**
Constant magnetic field, pulsating magnetic field, Magnetic field produced by a single winding - fixed current and alternating current Pulsating fields produced by spatially displaced windings, Windings spatially shifted by 90 degrees, Three windings spatially shifted by 120 degrees (carrying three-phase balanced currents), revolving magnetic field.

**Unit-II**

**Induction Machines (10 Hours):**
Construction, Types (squirrel cage, slip-ring and double cage), Torque Slip Characteristics, Starting and Maximum Torque, Equivalent circuit, Phasor Diagram, Losses and Efficiency, Effect of parameter variation on torque speed characteristics (variation of rotor and stator resistances, stator voltage, frequency). Methods of starting, braking and speed control of induction motors.

**Unit-III**

**Induction Machines (3 Hours):**
Generator operation, Types-Self-excitation, Doubly-Fed Induction Machines and their applications

**Single-phase induction motors (6 Hours):**
Constructional features, double revolving field theory, equivalent circuit, determination of parameters, Split-phase starting methods and applications

## Unit-IV

**Synchronous machines (10 Hours):**
Constructional features, cylindrical rotor synchronous machine - generated EMF, equivalent circuit and phasor diagram, armature reaction, synchronous impedance, voltage regulation. characteristics of synchronous machines, V-curves. Salient pole machine - two reaction theory, analysis of phasor diagram, power angle characteristics. Parallel operation of alternators - synchronization and load division.

Text/References:


1. A. E. Fitzgerald and C. Kingsley, "Electric Machinery", McGraw Hill Education, 2013.
2. M. G. Say, "Performance and design of AC machines", CBS Publishers, 2002.
3. P. S. Bimbhra, "Electrical Machinery", Khanna Publishers, 2011.
4. I. J. Nagrath and D. P. Kothari, "Electric Machines", McGraw Hill Education, 2010.
5. A. S. Langsdorf, "Alternating current machines", McGraw Hill Education, 1984.
6. P. C. Sen, "Principles of Electric Machines and Power Electronics", John Wiley & Sons, 2007.


**Note:**

1. The paper setter will set two questions (with/without parts) from each unit, and a ninth compulsory question comprising of 6 to 10 sub parts (short questions), covering the entire syllabus. The examinee will attempt five questions in all, along with the compulsory question (with all it sub parts), selecting one question from each unit.
2. Examinees will be allowed to use only non-programmable scientific calculators in the examination. Other electronic gadgets and sharing of materials will not be permitted during the examinations.

BT EE404A ELECTRICAL MACHINE -II LABORATORY

B.TECH. (ELECTRICAL ENGINEERING)
SEMESTER-IV

| L | P | Credits |
|---|---|---|
| 0 | 2 | 1 |

Class-work Marks: 30
Exam Marks: 70
Total Marks: 100
Duration of Examination: 3 Hrs

LIST OF EXPERIMENTS:

1. To execute starting and reversing the direction of rotation of 1-Phase and 3-Phase induction motor.
2. To perform the open circuit test and block rotor test on 3 phase induction motor and determine equivalent circuit parameters.
3. To conduct the load test to determine the performance characteristics of the I.M.
4. To compute the torque v/s speed characteristics of 3-phase induction motor for various stator voltages.
5. To effect speed control of induction motor by rotor resistance control.
6. To effect speed control of 3-Phase induction motor by V/f control method.
7. To perform the open circuit test and block rotor test on single-phase induction motor and determine equivalent circuit parameters.
8. To draw Voltage Vs load Characteristics of 3 phase synchronous generator, and draw input vs. Output power.
9. To perform O.C. test on synchronous generator. And determine the full load regulation of a three phase synchronous generator by synchronous impedance method.
10. To plot V- Curve of synchronous motor.
11. To effect the parallel operation of synchronous generators.

**Note:**

1. At least 8 experiments are to be performed by students in the semester.
2. At least 6 experiments should be performed from the above list; remaining two experiments may either be performed from the above list or designed and set by the Dept. as per the scope of the syllabus.

BT EE405A POWER SYSTEMS-I

B.TECH. (ELECTRICAL ENGINEERING)
SEMESTER-IV

| L | T | P | Credits |
|---|---|---|---|
| 3 | 0 | - | 3 |

Class-work Marks: 30
Exam Marks: 70
Total Marks: 100
Duration of Examination: 3 Hrs

**COURSE OBJECTIVES:**

- To understand the working of different types of power generation systems
- To realize the necessity for interconnected operation of different power stations.
- Ideatify major components of power transmission and distribution systems.
- Describe the principle of operation of transmission and distribution equipment.
- Know and appreciate the key factors in equipment specification and network design

**Course Outcomes:**

Upon completion of this course, students will be able to

- Understand the major components of Transmission and Distribution Systems (TDS) and its practical significance
- Good Knowledge of various equipment specifications and design for TDS
- Awareness of latest technologies in the field of electrical transmission and distribution.
- Appreciate the different types of tariff, consumers and different types of power generation plants.
- Determine the significance of various components of the power generation plants.
- Correlate the importance of interconnected operation of different power generation systems.
- Plan an appropriate scheduling of electric power to satisfy the demand constraint

**UNIT I**

Hydro-electric, Thermal steam power plants, Nuclear power plants – selection of site, elements of power plant, working and classification, Renewable power plants – Solar power generation – Photo-voltaic and solar thermal generation – solar concentrators, Wind power generation – types of wind mills, wind generators, tidal, biomass, geothermal and magneto-hydro dynamic power generation, micro-hydel power plants, fuel cells and diesel and gas power plants

**UNIT II**

Transmission line parameters – Resistance, Inductance and Capacitance calculations – single phase and three phase lines – double circuit lines – effect of earth on transmission line capacitance Performance of transmission lines – Regulation and efficiency – Tuned power lines, Power flow through a transmission line – Power circle diagrams, Sag and tension calculation – Line supports – Insulators, Voltage distribution in suspension insulators — string efficiency – effects of wind and ice loading.

**UNIT III**

Introduction, arcing in circuit breakers, arc interruption theories, re-striking and recovery voltage, resistance switching, current chopping, interruption of capacitive current, oil circuit breaker, air blast circuit breakers, SF6 circuit breaker, vacuum CBs, operating mechanism, selection of circuit breakers, high voltage d.c. breakers, ratings of circuit breakers, testing of circuit breakers.

## UNIT IV

Relays – General classification. Principle of operation, types, characteristics, Torque equation, Relaying Schemes, Relay Co- ordination.

Apparatus and line protection – Line Protection – Distance, Differential protection and Carrier current protection. Generator protection – protection against abnormal condition, stator and Rotor protection. Transformer Protection – Incipient fault – Differential protection, Feeder and Bus bar protection.

References

1. D. P. Kothari and IJ Nagrath, 'Power System Engineering', Tata Mcgraw – Hill, 2nd Edition, 2008.
2. Singh S N, 'Electric Power Generation Transmission and distribution', PHI India, 2nd Edition,2008
3. Chakrabarti A., Soni M.L., Gupta P.V., and Bhatnagar U.S., 'A Text Book on Power Systems Engg', Dhanpat Rai and Sons, New Delhi, 2nd Revised Edition, 2010.
4. B.R.Gupta, 'Generation of Electrical Energy', S. Chand Limited, 2009.
5. Wadhwa, C.L., 'Generation Distribution and Utilisation of Electrical Energy', New Age International Publishers, 3rd Edition, 2010.
6. Mohammad Shahidehpour, Hatim Yamin, 'Market Operations in Electric Power Systems', John Wiley & Sons Inc., 2002.

**Note:**

1. The paper setter will set two questions (with/without parts) from each unit, and a ninth compulsory question comprising of 6 to 10 sub parts (short questions), covering the entire syllabus. The examinee will attempt five questions in all, along with the compulsory question (with all it sub parts), selecting one question from each unit.
2. Examinees will be allowed to use only non-programmable scientific calculators in the examination. Other electronic gadgets and sharing of materials will not be permitted during the examinations.

BT EE406A POWER SYSTEMS LABORATORY-I

B.TECH. (ELECTRICAL ENGINEERING)
SEMESTER-IV

| L | T | P | Credits |
|---|---|---|---|
| 0 | 0 | 2 | 1 |

Class-work Marks: 30
Exam Marks: 70
Total Marks: 100
Duration of Examination: 3 Hrs

**Course Objectives**

The main objective of the course is to:

1. Understand the different concepts in power systems by performing various experiments and tests in the laboratory.

**List of Experiments**

1. Set up on experiment to study the performance of a long transmission line under no load and under light load condition.
2. Set up on experiment kit to study the performance of a long transmission line under load at different power factors.
3. Set up on experiment kit to find out the ABCD and hybrid parameters of given transmission model.
4. Condition Monitoring of Distribution Transformer Oil Testing: Determine the strength of the given transformer oil.
5. Partial Discharge Testing: Determine the partial discharge level of the given distribution transformer as a function of voltage.
6. Voltage Regulation of a long transmission line with resistive inductive and capacitive loads.
7. Study of Thermal and Hydro power plants.
8. To determine fault current for L-G, L-L, L-L-G and L-L-L faults at the terminals of an alternator at very low excitation.
9. To study the IDMT over current relay and determine the time current characteristics.
10. To study percentage differential relay, Impedance, MHO and Reactance type distance relays.
11. To determine location of fault in a cable using cable fault locator.

**Note:**

1. At least 8 experiments are to be performed by students in the semester.
2. At least 6 experiments should be performed from the above list; remaining two experiments may either be performed from the above list or designed and set by the Dept. as per the scope of the syllabus.

## BT EE407A SIGNAL AND SYSTEMS

### B.TECH. (ELECTRICAL ENGINEERING)
### SEMESTER-IV

| L | P | P | Credits | | |
|---|---|---|---|---|---|
| 3 | 0 | - | 3 | Class-work Marks | : 30 |
| | | | | Exam Marks | : 70 |
| | | | | Total Marks | : 100 |
| | | | | Duration of Examination | : 3 Hrs |

COURSE OBJECTIVES:

The main goals of this course are:

1. To provide the basic understanding about the signals and their basic properties.
2. To give the ideas about different types of signals and systems.
3. Understanding of the signal analysis tools and conversion from one domain to the other.
4. To give the knowledge of the sampling and reconstruction of the sampled signal.

COURSE OUTCOMES:

After going through this course, the students shall be able to:

1. Understand the concepts of continuous time and discrete time systems.
2. Analyse systems in complex frequency domain.
3. Understand sampling theorem and its implications.

### UNIT - I

**Introduction to Signals and Systems**: Signals and systems as seen in everyday life, and in various branches of engineering and science. Signal properties: periodicity, absolute integrability, deterministic and stochastic character. Some special signals of importance: the unit step, the unit impulse, the sinusoid, the complex exponential, some special time-limited signals; continuous and discrete time signals, continuous and discrete amplitude signals. System properties: linearity: additively and homogeneity, shift-invariance, causality, stability, realizability. Examples.

(10 hours)

### UNIT - II

**Behavior of continuous and discrete-time LTI systems:** Impulse response and step response, convolution, input-output behavior with aperiodic convergent inputs, Cascade interconnections. Characterization of causality and stability of LTI systems. System representation through differential equations and difference equations. Periodic inputs to an LTI system, the notion of a frequency response and its relation to the impulse response.

(10 hours)

### UNIT - III

**Fourier, Laplace and z- Transforms:** Fourier series representation of periodic signals. Waveform Symmetries, Calculation of Fourier Coefficients. Fourier Transform, convolution/multiplication and their effect in the frequency domain, magnitude and phase response, Fourier domain duality. The Discrete-Time Fourier Transform (DTFT) and the Discrete Fourier Transform (DFT). Parseval's Theorem. Review of the Laplace Transform for continuous time signals and systems, system functions, poles and zeros of system functions and signals, Laplace domain analysis, solution to differential equations and system behavior.

The z-Transform for discrete time signals and systems, system functions, poles and zeros of systems and sequences, z-domain analysis.

(12 hours)

## UNIT - IV

**Sampling and Reconstruction:** The Sampling Theorem and its implications. Spectra of sampled signals. Reconstruction: ideal interpolator, zero-order hold, first-order hold. Aliasing and its effects. Relation between continuous and discrete time systems, filtering.

(8 hours)

TEXT/REFERENCES:


1. A. V. Oppenheim, A. S. Willsky and S. H. Nawab, "Signals and systems", Prentice Hall India, 1997.
2. J. G. Proakis and D. G. Manolakis, "Digital Signal Processing: Principles, Algorithms, and Applications", Pearson, 2006.
3. H. P. Hsu, "Signals and systems", Schaum's series, McGraw Hill Education, 2010.
4. S. Haykin and B. V. Veen, "Signals and Systems", John Wiley and Sons, 2007.
5. A. V. Oppenheim and R. W. Schafer, "Discrete-Time Signal Processing", Prentice Hall, 2009.
6. M. J. Robert "Fundamentals of Signals and Systems", McGraw Hill Education, 2007.
7. B. P. Lathi, "Linear Systems and Signals", Oxford University Press, 2009.


**Note:**

1. The paper setter will set two questions (with/without parts) from each unit, and a ninth compulsory question comprising of 6 to 10 sub parts (short questions), covering the entire syllabus. The examinee will attempt five questions in all, along with the compulsory question (with all it sub parts), selecting one question from each unit.
2. Examinees will be allowed to use only non-programmable scientific calculators in the examination. Other electronic gadgets and sharing of materials will not be permitted during the examinations.

BT EE408A Mathematics- III

B.TECH. (ELECTRICAL ENGINEERING)
SEMESTER-IV

| L | T | P | Credits | | |
|---|---|---|---|---|---|
| 3 | 1 | - | 4 | Class-work Marks | : 30 |
| | | | | Exam Marks | : 70 |
| | | | | Total Marks | : 100 |
| | | | | Duration of Examination | : 3 Hrs |

## UNIT I

Central tendency: Mean, Mode , Median, Geometric mean, variance, standard deviation, Moments, skewness and Kurtosis;

Basic Probability: Probability spaces, conditional probability, independence, Bayes theorem; Discrete random variables. Independent random variables.

## UNIT II

Expectation of discrete random variables, Correlation coefficient and rank of correlation coefficient, Chebyshev's Inequality.

Discrete probability distribution: Uniform distribution, Binomial distribution, Poisson distribution, evaluation of statistical parameters for these distributions.

## UNIT III

Continuous random varibales and their properties, distribution functions and densities, normal, exponential and gamma distributions. Bivariate Distributions: Bivariate distributions and their properties, distribution of sums and quotients, conditional densities.

Curve fitting by the method of least squares- fitting of straight lines, second degree parabolas and more general curves.

## UNIT IV

Test of significance: Large sample test for single proportion, difference of proportions, single mean, difference of means, and difference of standard deviations. Small Sample: Test for single mean, difference of means and correlation coefficients, test for ratio of variances - Chi-square test for goodness of fit and independence of attributes.

**Text Books:**


[1] S. M. Ross, *Introduction to Probability and Statistics for Engineers and Scientists*, 5 edition. Amsterdam ; Boston: Academic Press, 2014.

[2] R. E. Walpole, R. H. Myers, S. L. Myers, and K. E. Ye, *Probability and Statistics for Engineers and Scientists*, 9 edition. Pearson, 2014.

[3] S. C. Gupta and Kapoor, *Fundamentals of Mathematical Statistics*. New Delhi: Sultan Chand & Sons, 2014.

[4] J. S. Milton and J. Arnold, *Introduction to Probability and Statistics: Principles and Applications for Engineering and the Computing Sciences*, 4 edition. New Delhi; New York: McGraw Hill Education, 2017.


**Reference Books:**


[1] D. Wackerly, W. Mendenhall, and R. L. Scheaffer, *Mathematical Statistics with Applications*, 7 edition. Belmont, CA: Thomson Brooks/Cole, 2008.

[2] P. G. Hoel, *Introduction to Mathematical Statistics*, 5 edition. New York: Wiley, 1984.

[3] H. J. Larson, *Introduction to Probability Theory and Statistical Inference*, 3 edition. New York: John Wiley & Sons, 1982.

## BT EE409A INDIAN CONSTITUTION

### B.TECH. (ELECTRICAL ENGINEERING)
### SEMESTER-IV

| L | P | P | Credits | | |
|---|---|---|---|---|---|
| 3 | 0 | - | 0 | Class-work Marks | : 30 |
| | | | | Exam Marks | : 70 |
| | | | | Total Marks | : 100 |
| | | | | Duration of Examination | : 3 Hrs |

**CONSTITUTION OF INDIA– BASIC FEATURES AND FUNDAMENTAL PRINCIPLES**

The Constitution of India is the supreme law of India. Parliament of India can not make any law which violates the Fundamental Rights enumerated under the Part III of the Constitution. The Parliament of India has been empowered to amend the Constitution under Article 368, however, it cannot use this power to change the "basic structure" of the constitution, which has been ruled and explained by the Supreme Court of India in its historical judgments. The Constitution of India reflects the idea of "Constitutionalism" – a modern and progressive concept historically developed by the thinkers of "liberalism" – an ideology which has been recognized as one of the most popular political ideology and result of historical struggles against arbitrary use of sovereign power by state. The historic revolutions in France, England, America and particularly European Renaissance and Reformation movement have resulted into progressive legal reforms in the form of "constitutionalism" in many countries. The Constitution of India was made by borrowing models and principles from many countries including United Kingdom and America.

The Constitution of India is not only a legal document but it also reflects social, political and economic perspectives of the Indian Society. It reflects India's legacy of "diversity". It has been said that Indian constitution reflects ideals of its freedom movement, however, few critics have argued that it does not truly incorporate our own ancient legal heritage and cultural values. No law can be "static" and therefore the Constitution of India has also been amended more than one hundred times. These amendments reflect political, social and economic developments since the year 1950.

The Indian judiciary and particularly the Supreme Court of India has played an historic role as the guardian of people. It has been protecting not only basic ideals of the Constitution but also strengthened the same through progressive interpretations of the text of the Constitution. The judicial activism of the Supreme Court of India and its historic contributions has been recognized throughout the world and it gradually made it "as one of the strongest court in the world".

**COURSE CONTENT**

**Unit-1**

1. Meaning of the constitution law and constitutionalism.
2. Historical perspective of the Constitution of India.
3. Salient features and characteristics of the Constitution of India.
4. Scheme of the fundamental rights.

**Unit-2**

1. The scheme of the Fundamental Duties and its legal status.
2. The Directive Principles of State Policy – Its importance and implementation.
3. Federal structure and distribution of legislative and financial powers between the Union and the States.

**Unit-3**

1. Parliamentary Form of Government in India – The constitution powers and status of the President of India
2. Amendment of the Constitutional Powers and Procedure
3. The historical perspectives of the constitutional amendments in India
4. Emergency Provisions : National Emergency, President Rule, Financial Emergency

**Unit-4**

1. Local Self Government – Constitutional Scheme in India
2. Scheme of the Fundamental Right to Equality
3. Scheme of the Fundamental Right to certain Freedom under Article 19
4. Scope of the Right to Life and Personal Liberty under Article 21

REFERENCES:

1. The Constitutional Law Of India 9th Edition, by Pandey. J. N.
2. The Constitution of India by P.M.Bakshi
3. Constitution Law of India by Narender Kumar
4. Bare Act by P. M. Bakshi

**Annexure-XI**

CENTRAL UNIVERSITY OF HARYANA, MAHENDERGARH

SCHOOL OF ENGINEERING AND TECHNOLOGY

Proceedings / Minutes of the Meeting
of School Board Held on 13.02.2019

The meeting of the School Board of School of Engineering and Technology was held on 13.02.2019. The following were present

1. Dr. Ajay Kumar Bansal, Dean, SOET- Chairman
2. Prof. D. V. S. Verma (Retd.), NIT, Kurukshetra- Member
3. Prof. Anjan Kumar Baral, Professor, GJUST, Hisar- Member
4. Dr. Vikas Garg,HOD, Civil Engg.- Member
5. Dr. Rajesh Kumar Dubey, Associate Professor, CUH- Member
6. Dr. Munish Manas, Assistant Professor, CUH- Member
7. Ms. Ekta Kumari, Assistant Professor, CUH- Member
8. Mr. Deepak Rana, Assistant Professor, CUH- Member
9. Mr. Tarun Singh, Assistant Professor, CUH- Member
10. Dr. Phool Singh, Associate Professor, CUH- Special Invitee
11. Dr. Kalpana Chauhan, Associate Professor, CUH- Special Invitee

Prof. B. R. Chahar, Dr. J. S. Saini and Dr. N. K. Jain, Subject Expert- Member could not attend the meeting due to prior engagements.

After deliberations, it was resolved/ recommended by the School Board as follows:

1. The Scheme of Studies & Examinations and the Syllabi of B.Tech. (Electrical Engg.)- II year (3rd and 4th semesters) approved by BOS, Electrical Engineering were discussed and approved for the Batch 2018-19 onwards (Annexure-1).

2. The Scheme of Studies & Examinations and the Syllabi of B.Tech. (Civil Engg.)- II year (3rd and 4th semesters) approved by BOS, Civil Engineering were discussed and approved for the Batch 2018-19 onwards (Annexure-2).

3. The Scheme of Studies & Examinations and the Syllabi of B.Tech. (Printing and Packaging Technology)- II year (3rd and 4th semesters) approved by BOS, PPT were discussed and approved for the Batch 2018-19 onwards (Annexure-3).

4. The Scheme of Studies & Examinations and the Syllabi of B.Tech. (Computer Science Engg.)- II year (3rd and 4th semesters) approved by BOS, Computer Science Engineering (Through mail) were discussed and approved for the Batch 2018-19 onwards (Annexure-4).

5. The Scheme of Studies & Examinations and the Syllabi of B.Tech. (common for All branches)- I year (1st and 2nd semesters) approved by various BOS were discussed and approved for the Batch 2019-20 onwards (Annexure-5).

The meeting ended with vote of thanks to the Chair.

13.02.19
Ms. Ekta Kumari

13/02/2019
Mr. Tarun Singh

Mr. Deepak Rana

Dr. Kalpana Chauhan

13/02/19
Dr. Munish Manga

Dr. Phool Singh

Dr. Rajesh Kumar Dubey

13/2/19
Dr. Vikas Garg

13-02-19
Dr. A. K. Baral

13/2/19
Prof. D. V. S. Verma

13/2/19
Dr. Ajay Kumar Bansal

## Central University of Haryana, Mahendergarh

Civil Engineering Department

Minutes of Meeting for Board of Studies on 13 Feburary, 2019

| Date | Time | Venue |
|---|---|---|
| 13/02/2019 | 10:00 AM-04:30 PM | Head Civil Engg Deptt, Central University |
| Meeting called by | Dr. Vikas Garg, HoD Civil Engineering Department | |
| Attendees | Dr D V S Verma,(Ex Professor, NIT, Kurukshetra), Dr Dhirendra Singhal Professor & Head, Civil Engg. Deptt, DCRUST, Murthal), Dr. Vikas Garg, Dr Kheraj, Er Deepak Rana, Er Ayush Vashist | |
| Review of Curriculum B. Tech-Civil Engineering as per AICTE Guidelines | | |

**Recommendations**

| | |
|---|---|
| 1 | The Syllabus & Scheme for BTech(UG) third and fourth semester was discussed and finalised |
| 2 | Paper setters for theory papers for Fourth Semester& VIth Semester have been discussed and finalised |
| 3 | Examiners for Practical Examination for Fourth Semester& VIth Semester have been discussed and finalised |
| 4 | PhD in Civil Engineering proposed to start from next academic session |

Dr D V S Verma

Dr Dhirendra Singhal 13/2/19

Dr Vikas Garg 13/02/19

Dr Kheraj 13/02/2019

Er Deepak Rana 13/2/19

Er Ayush Vashisth 13/02/19

# CENTRAL UNIVERSITY OF HARYANA

## School of Engineering and Technology

## Syllabus for Third & Fourth Semester

## CIVIL ENGINEERING

## Choice Based Credit Scheme w.e.f. 2019-20

**CENTRAL UNIVERSITY OF HARYANA**
**SCHEME OF STUDIES & EXAMINATIONS**
**B.Tech. 2nd YEAR (SEMESTER – III: CIVIL ENGINEERING)**
**Choice Based Credit Scheme w.e.f. 2019-20**

| S. No. | Course No. | Course Title | Teaching Schedule | | | Marks of Class work | Examination Marks | | Total | Credit | Duration of Exam |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | L | T | P/D | | Theory | Practical | | | |
| 1 | BT MAT 215A | MATHS III (TRANSFORM AND DISCRETE MATHEMATICS) | 3 | - | - | 30 | 70 | - | 100 | 3 | 3 |
| 2 | BT CE 201A | STRENGTH OF MATERIALS | 3 | 1 | - | 30 | 70 | - | 100 | 4 | 3 |
| 3 | BT CE 203A | SURVEYING | 3 | 1 | - | 30 | 70 | - | 100 | 4 | 3 |
| 4 | BT CE 205A | FLUID MECHANICS-I | 3 | 1 | - | 30 | 70 | - | 100 | 4 | 3 |
| 5 | BT CE 207A | BUILDING CONSTRUCTION AND MATERIALS | 3 | - | - | 30 | 70 | - | 100 | 3 | 3 |
| 6 | | GEC-I | 3 | 1 | 0 | 30 | 70 | | 100 | 4 | 3 |
| 7 | BT CE 209A | STRENGTH OF MATERIALS LAB | - | - | 2 | 30 | | 70 | 100 | 1 | 3 |
| 8 | BT CE 211A | SURVEYING LAB | - | - | 2 | 30 | | 70 | 100 | 1 | 3 |
| 9 | BT CE 213A | FLUID MECHANICS LAB | - | - | 2 | 30 | | 70 | 100 | 1 | 3 |
| 10 | BT AUD 201 | ENVIRONMENTAL SCIENCES | 2 | - | - | 30 | 70 | - | 100 | 0 | 3 |
| **Total** | | | **20** | **4** | **6** | **300** | **490** | **210** | **1000** | **25** | |

## CENTRAL UNIVERSITY OF HARYANA
## SCHEME OF STUDIES & EXAMINATIONS
### B.Tech. 2nd YEAR (SEMESTER – IV: CIVIL ENGINEERING)
### Choice Based Credit Scheme w.e.f. 2019-20

| S. No. | Course No. | Course Title | Teaching Schedule | | | Marks of Class work | Examination Marks | | Total | Credit | Durations of Exam |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | L | T | P | | Theory | Practical | | | |
| 1 | BT CE 202A | STRUCTURAL ANALYSIS - I | 3 | 1 | - | 30 | 70 | - | 100 | 4 | 3 |
| 2 | BT CE 204A | FLUID MECHANICS-II | 3 | 1 | - | 30 | 70 | - | 100 | 4 | 3 |
| 3 | BT CE206A | GEOMATIC ENGG | 3 | - | - | 30 | 70 | - | 100 | 3 | 3 |
| 4 | BT CE208A | TRANSPORTATION ENGINEERING - I | 3 | 0 | - | 30 | 70 | - | 100 | 3 | 3 |
| 5 | BT CE 218 A | MECHANICAL ENGINEERING | 3 | 0 | - | 30 | 70 | - | 100 | 3 | 3 |
| 6 | | GEC-II | 3 | 1 | - | 30 | 70 | - | 100 | 4 | 3 |
| 7 | BT CE 210A | STRUCTURAL ANALYSIS – I LAB | - | - | 2 | 30 | | 70 | 100 | 1 | 3 |
| 8 | BT CE 212A | FLUID MECHANICS-II LAB | - | - | 2 | 30 | | 70 | 100 | 1 | 3 |
| 9 | BT CE 214A | GEOMATIC ENGINEERING LAB | - | - | 2 | 30 | | 70 | 100 | 1 | 3 |
| 10 | BT CE216A | TRANSPORTATION ENGINEERING – I LAB | - | - | 2 | 30 | | 70 | 100 | 1 | 3 |
| 11 | BT CE 202A | GENERAL FITNESS IN CIVIL ENGINEERING | - | - | - | - | - | 70 | 70 | - | 3 |
| **Total** | | | **18** | **3** | **8** | **300** | **420** | **350** | **1070** | **25** | |

## BT CE AUD 201 (Environmental Studies)

| L | T | P/D | Credits | | | |
|---|---|---|---|---|---|---|
| 2 | -- | -- | 0 | Field Work | : | 30 Marks |
| | | | | Examination (Theory/Practical) | : | 70 Marks |
| | | | | Total | : | 100 Marks |
| | | | | Duration of Examination | : | 3 Hours |

### UNIT I

The Multidisciplinary Nature of Environmental Studies. Introduction to Environment Definition, Scope, and importance of environmental studies; need for public awareness.

Environmental Pollution Definition, Cause and effects of Air pollution, Water pollution, Soil pollution, Marine pollution, Noise pollution. Role of an individual in prevention of pollution, Pollution case studies

### UNIT- II

Natural Resources: Water resources, over-utilization, floods, drought, dams-benefits and problems, Mineral resources: Use and exploitation, environmental effects; Food resources : changes caused by modern agriculture, fertilizer-pesticide problems, water logging, Energy resources Growing energy needs, renewable and non renewable energy sources, Land resources Land as a resource, land degradation, man induced landslides, soil erosion and desertification

### UNIT –III

Ecosystems and Biodiversity: Concept of an ecosystem, Structure and function, Energy flow, Ecological succession, ecological pyramids. Concept of Biodiversity, definition and types, Hot-spots of biodiversity, Threats to biodiversity, Endangered and endemic species of India, Conservation of biodiversity

### UNIT –IV

Social Issues and Environment. Water conservation, rain water harvesting, Environmental ethics: Issues and possible solutions. Climate change, global warming, acid rain, ozone layer depletion, Public awareness Population growth, variation among nations, Family Welfare Programme. Human Population and the Environment - Population growth, Population explosion, Women and Child Welfare.

Field Work - Visit to a local area to document environmental assets--river/forest/grassland/hill/ mountain. Visit to a local polluted site -Urban/Rural/Industrial/Agricultural. Study of common plants, insects, birds. Study of simple ecosystems—pond, river, hill slopes, etc
(Field work equal to 5 lecture hours)

REFERNCE BOOKS:


1 **A Textbook of Environmental Studies** by Asthana D K and Asthana Meera 2010

2. **Fundamental Concepts in Environmental Studies** by Mishra D D 2012

3 **Environmental Studies** by S.C Sharma M.P Poonia 2005

4 **Textbook of Environmental Studies for Undergraduate** by Erach Bharucha 2018

5. **Environmental Studies: Third Edition** by R. Rajagopalan April 2015

## Mathematics-III(TRANSFORM AND DISCRETE MATHEMATICS)

| L | T | P/D | Credits | | | |
|---|---|---|---|---|---|---|
| 3 | -- | -- | 0 | Field Work | : | 30 Marks |
| | | | | Examination (Theory/Practical) | : | 70 Marks |
| | | | | Total | : | 100 Marks |
| | | | | Duration of Examination | : | 3 Hours |

### UNIT – I

Laplace Transform: Definition and existence of Laplace transform, Properties of Laplace Transform and formulae, Unit Step function, Dirac Delta function, Heaviside function, Laplace transform of periodic functions. Finding inverse Laplace transform by different methods, convolution theorem. Evaluation of integrals by Laplace transform, solving ODEs by Laplace transforms method.

### UNIT – II

Fourier Transform: Fourier Complex, Sine and Cosine transform, properties and formulae, inverse Fourier transforms, Convolution theorem. Fourier transform applications to solve ordinary and partial differential equations

### UNIT – III

**Set Theory**: Algebra of sets, Classes of sets, Power Sets, Multi sets, Cartesian Product, Representation of relations, Types of relation, Equivalence relations and partitions, Partial ordering relations

**Techniques of Counting**: Permutations with and without repetition, Combination, Pigeonhole principle

### UNIT – IV

**Algebric Structures**: Definition and examples of a monoid, Semigroup, Groups and rings, Homomorphism, Isomorphism and Automorphism, Subgroups and Normal subgroups, Cyclic groups, Integral domain and fields, Cosets, Lagrange's theorem.

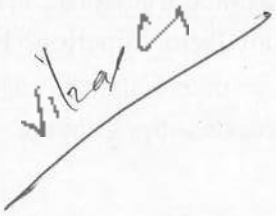
**Text Books:**


1. E Kreyszig, *Advanced Engineering Mathematics*, 10 edition. Hoboken, NJ: Wiley, 2011.
2. J.-P. Tremblay and R. Manohar, *Discrete Mathematical Structures with Applications to Computer Science*, 1 edition. New Delhi, India: McGraw Hill Education, 2017
3. B. Kolman, R. Busby, and S. C. Ross, *Discrete Mathematical Structures*, 6 edition

Upper Saddle River, NJ: Pearson, 2015.
4 B S. Grewal, *Higher Engineering Mathematics 44th Edition*. Khanna Publishers, 2017.

**Reference Books:**

1. S. Lipschutz, M. L. Lipson, and V H. Patil, *Discrete Mathematics*, Revised Third edition. McGraw Hill Education, 2017.
2. C L. Liu. and Mohapatra, *Elements of Discrete Mathematics: A Computer Oriented Approach*, 4th edition. New York: Mc Graw Hill India, 2017.
3 J. Bird, *Higher Engineering Mathematics, 7th ed.* 7 edition Abingdon, Oxon; New York, NY: Routledge, 2014
4. R. K. Jain and S R. K Iyengar, *Advanced Engineering Mathematics 4/e* ], Fourth edition edition. Oxford: Narosa Publishing House Pvt. Ltd. - New Delhi, 2014.



## BT CE 201A: STRENGTH OF MATERIALS

**B. Tech. 2nd Year (Semester – III)**

| L | T | P | Credits | | | |
|---|---|---|---|---|---|---|
| 3 | 1 | -- | 4 | Class Work | : | 30 Marks |
| | | | | Examination | : | 70Marks |
| | | | | Total | : | 100 Marks |
| | | | | Duration of Examination | : | 3 Hours |

UNIT - I

**Introduction:** Concept of stress and strain, generalized Hooke's law, Stress-strain diagram of ductile and brittle material, thermal stresses, volumetric stresses and strains, Analysis of Principal stresses and Strains, Mohr's stress circle, Relationship among elastic constants

**Shear force and Bending moment diagrams:** Types of load on beam and Itames, classification of beams, statically determinate problems, shear force and bending moment diagrams simply supported, overhang and cantilever beams subjected to any combination of point loads, uniformly distributed and varying load and moment, relationship between load, shear force and bending moment.

UNIT – II

**Theory of pure bending:** Flexural Stresses-Theory of simple bending – Assumptions Derivation of bending equation: $M/I = f/y = E/R$ - Neutral axis – Determination of bending stresses Section modulus of rectangular and circular sections (Solid and Hollow), I, T and Channel sections.

**Shear Stresses in Beams:** Shear stress formula for beams, shear stress distribution in beams like rectangular, circular, triangular, I, T sections Numericals

UNIT – III

**Torsion of Circular shafts:** Basic assumptions, torsion formula, power transmitted by shafts, design of solid and Hollow shafts based on strength and stiffness.

**Columns & Struts** Column under axial load, concept of instability and buckling, slenderness ratio, derivation of Euler's formulae for the elastic buckling load. Rankine Gordon Formula, Secant Formula, eccentric compression of a short strut of rectangular & circular sections, Numericals

UNIT – IV

**Slope & Deflection:** Relationship between bending moment, slope & deflection, Mohr's theorem, moment area method, conjugate beam method, method of integration, Macaulay's method, calculations for slope and deflection of (i) cantilevers and (ii) simply supported beams with or without overhang under concentrated load, Uniformly distributed loads or combination of concentrated and uniformly distributed loads, Numericals.

**Strain energy:** strain energy under axial, bending, shear, torsion, gradual, sudden and impact loading

**Text Books**

1. Strength of Materials by G H Ryder, ELBS publishers 2016
2. Elements of Strength of Materials by Timoshenko & Young, East- West Press, New Delhi, 2003.
3. Mechanics of Materials by Beer and Johnston. Tata McGraw Hill. 2015
4. Elementary Structural Analysis, Norris & Wilbur. McGraw Hill Publisher 1991
5. Strength of Materials. R K Bansal, Luxmi Publications 2018
6. Strength of Materials, U C Jindal, Pearson Publications 2012

**Reference Books**

1. Strength of Materials by Sadhu Singh, Khanna Publishers 2014
2. Basic Structural Analysis, C.S. Reddy, Tata McGraw Hill Publication. 2010
3. Fundamentals of Solid Mechanics by M L Gambhir, Prentice Hall of India 2011
4. Strength of Materials Ramamurtham and Narayanan, S Chand & Co. 2014
5. Fundamentals of Structural Analysis B D Nautiyal, New Age Publishers 2001

## BT CE 205A: FLUID MECHANICS-1
### B. Tech. 2nd Year (Semester – III)

| L | T | P | Credits | | | |
|---|---|---|---|---|---|---|
| 3 | 1 | - | 4 | Class Work | : | 30 Marks |
| | | | | Examination | : | 70 Marks |
| | | | | Total | : | 100 Marks |
| | | | | Duration of Examination | : | 3 Hours |

### UNIT-I

**Introduction:**

Fluid properties, mass density, specific weight, specific volume and specific gravity, surface tension, capillarity, pressure inside a droplet and bubble due to surface tension, compressibility viscosity, Newtonian and Non-newtonian fluids, real and ideal fluids

**Kinematics of Fluid Flow:**

Steady & unsteady, uniform and non-uniform, laminar & turbulent flows, one, two & three dimensional flows, stream lines, streak lines and path lines, continuity equation in differential form, rotation and circulation, elementary explanation of stream function and velocity potential, rotational and irrotational flows, graphical and experimental methods of drawing flownets

### UNIT-II

**Fluid Statics:**

Pressure-density-height relationship, gauge and absolute pressure, simple differential and sensitive manometers, two liquid manometers, pressure on plane and curved surfaces, center of pressure, Buoyancy, stability of immersed and floating bodies, determination of metacentric height, fluid masses subjected to uniform acceleration, free and forced vortex.

### UNIT-III

**Dynamic of Fluid Flow:**

Euler's equation of motion along a streamline and its integration, limitation of Bernoulli's equation, Pitot tubes, venturimeter, orificemeter, flow through orifices & mouth pieces, sharp crested weirs and notches, aeration of nappe

**Dimensional Analysis and Hydraulic Similude:**

Dimensional analysis, Buckinghum theorem, important dimensionless numbers and their

significance, geometric, kinematic and dynamic similarity, model studies, physical modeling, similar and distorted models.

## UNIT-IV

**Boundary layer analysis:**

Boundary layer thickness, boundary layer over a flat plate, laminar boundary layer, turbulent boundary layer, laminar sub-layer, smooth and rough boundaries, local and average friction coefficient, separation and its control.

**Drag and Lift:**

Types of drag, drag on a sphere, flat plate, cylinder and airfoil, development of lift on immersed bodies like circular cylinder and airfoil, flow around a sphere-Stokes' law

**Books:**


1. Fluid Mechanics by Modi & Seth , Standard Book House, New Delhi 2018
2. Fluid Mechanics Through Problems by R J Garde 2011
3. Engineering Fluid Mechanics by R.J.Garde & A G.Mirajgaoker 2010
4. Fluid Mechanics A.K.Jain Khanna Publishers, New Delhi


**Reference books**


1. Introduction to Fluid Mechanics by Robert W Fox & Alan T.McDonald 2011
2. Fluid Mechanics Through Problems by R.J Garde 2011
3. Streeter V.L., Fluid mechanics, Tata McGraw Hill, 1998.
4. Fluid Mechanics John F. Douglas, Gasiorek & Swaffield, Pearson Education 2006

## BTCE 207A: BUILDING CONSTRUCTION AND MATERIALS

**B. Tech. 2nd Year (Semester – III)**

| L | T | P | Credits | | | |
|---|---|---|---|---|---|---|
| 3 | -- | - | 3 | Class Work | : | 30 Marks |
| | | | | Examination | : | 70 Marks |
| | | | | Total | : | 100 Marks |
| | | | | Duration of Examination | : | 3 Hours |

### UNIT - I

**Bricks:** Composition of good brick earth, harmful ingredient, manufacture of bricks, characteristics of good bricks, testing of bricks, classification of bricks as per IS 1077-1985.

**Rocks and Stones:** Classification of rocks, test for stones, characteristics of a good building stone, deterioration of stones, common building stones of India, comparison of the brick work and stone work

**Timber:** Classification of timbers, structure of timber, seasoning of timber, defects in timber, fire proofing of timber

### UNIT - II

**Cement:** Types, Manufacture, basic properties of cement compounds, grades, packing, storage, quality control and curing, additives, special cements, all testing as per IS

**Steel:** Manufacture of steel, market forms of steel e.g. mild steel and HYSD steel bars, rolled steel sections, stainless steel mortars

**Aggregates:** Classification of Aggregates, Characteristics of Aggregate, Deleterious Materials and Organic Impurities, Soundness, Alkali-Aggregate Reaction, Thermal Properties of Aggregate, Fine Aggregate, Coarse Aggregate, Broken Brick Coarse Aggregate, Testing of Aggregates

### UNIT - III

**Masonry**, stone masonry, basic terms, materials for stone masonry, classification, dressing of stones, joints in stone masonry, Brick Masonry, laying tools, basic terms, bonding of bricks, tools, inspection of brickwork, strength of brick work, Cavity walls, features, wall ties, construction of cavity wall, Lintels.

**Construction equipment's:** Modern equipment's used in the construction of multi storey buildings and bridges

### UNIT - IV

**Damp proof course** requirement in buildings, D P C at Plinth level, in basement and roof tops etc. Basement & Retaining walls, Drawings

**Foundation** types and suitability, spread, arch, combined, cantilevered, Raft, Grillage, Piles & wells, Footings in black cotton soil, IS Specifications and drawings

**Stairs & Stair cases:** Suitability of location, stairs in multi-storeyed buildings, Residential and public buildings, dimensions, Requirements, classification, types of stairs, Lift & escalators, drawings.

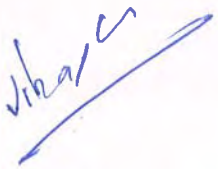
**Text Books**


1. Building Materials by P C Varghese, PHI, 2015
2. Engineering Materials, by S.C. Rangawala, Charotar Publishing House, Anand 2017

3. Building Construction by Sushil Kumar, Standard Publisher and Distributors. 2014
4. Building Construction by B. C. Punima, Laxmi Publisher House 2016

**Reference Books**


1. Engineering Materials, by Sushil Kumar, Metropolitan Press 2014
2. Engineering Materials by N.C. Choudhary, Technical Publishers.2012
3. Materials Science, J.C. Anderson & KDB Lever, ELBS. 2008.
4. Indian Practical Civil Engg. Handbook, P N Khanna, Engineers Publishers, 2012.
5. National Building Code, B. I. S. 2016

## BT CE 209A: STRENGTH OF MATERIALS LAB

**B. Tech. 2nd Year (Semester – III)**

| L | T | P | Credits | | | |
|---|---|---|---|---|---|---|
| -- | -- | 2 | 1 | Class Work | : | 30 Marks |
| | | | | Examination | : | 70 Marks |
| | | | | Total | : | 100 Marks |
| | | | | Duration of Examination | : | 3 Hours |

**List of Experiments:**

1. To determine Rockwell hardness number of the specimen of steel/soft metal.
2. To determine Brinnel hardness number of the specimen of steel/soft metal
3. To study the behavior of ductile material under tension on Universal Testing Machine
4. To study the behavior of brittle material under tension on Universal Testing machine
5. To study the behavior of brittle material under compression on Universal Testing machine
6. To determine the Torsional rigidity of shaft on torsion testing machine.
7. To determine the impact strength of M.S./C.I. specimen on Izod impact testing machine
8. To determine the impact strength of M.S./C.I. specimen on Charpy impact testing machine
9. To determine flexural rigidity of a beam simply supported at the ends and carrying a concentrated load at the center

## BT CE – 211A: SURVEYING LAB

**B. Tech. 2nd Year (Semester – III)**

| L | T | P | Credits |
|---|---|---|---|
| – | – | 2 | 1 |

| | | |
|---|---|---|
| Class Work | : | 30 Marks |
| Examination | : | 70 Marks |
| Total | : | 100 Marks |
| Duration of Examination | : | 3 Hours |

---

List of Experiments

1. Chain Survey of an area
2. Compass Surveying
3. Plane table survey of an area.
4. Leveling Exercises
5. Measurement of vertical and horizontal angles with Theodolite
6. Tachometric Constants
7. Tachometric Survey
8. Two point / three point problem.
9. Setting out a simple circular curve by different methods.
10. Measurements with Total Station.

## BT CE – 213A: FLUID MECHANICS LAB

B. Tech. 2nd Year (Semester – IV)

| L | T | P | Credits |
|---|---|---|---|
| -- | -- | 2 | 1 |

| | | | |
|---|---|---|---|
| Class Work | | : | 30 Marks |
| Examination | | : | 70 Marks |
| Total | | : | 100 Marks |
| Duration | of | : | 3 Hours |
| Examination | | | |

---

**List of Experiments**

1. Verification of Bernoulli's Theorem
2. Calibration of Venturimeter.
3. Calibration of an orifice meter
4. Determination of Hydraulics Coefficients of a circular orifice
5. Determination of friction factor for pipes.
6. Visualization of laminar and turbulent flow and estimating critical Reynold's number.
7. Determination of metacentric height of a ship model.
8. To measure the velocity distribution over a flat surface in a wind tunnel and to determine the Reynold's no and boundary layer thickness along the plate.
9. To measure the pressure distribution around a cylinder in a wind tunnel and to calculate the coefficient of drag at different Reynold's number

# IV Semester

## CE – 202 A: STRUCTURAL ANALYSIS I

**B. Tech. 2nd Year (Semester – IV)**

| L | T | P | Credits | | | |
|---|---|---|---|---|---|---|
| 3 | 1 | -- | 4 | Class Work | : | 30 Marks |
| | | | | Examination | : | 70Marks |
| | | | | Total | : | 100 Marks |
| | | | | Duration of Examination | : | 3 Hours |

### UNIT I

**Analysis of Determinate Trusses** Introduction, various types, stability, determination of forces in member of trusses by method of joints, method of sections, zero force members.

**Deflection of Beams** Review of Double Integration Method and Macaulay's Method, moment area theorem, conjugate beam method, unit method and strain energy method Maxwell's reciprocal theorem

### UNIT II

**Fixed and Continuous Beams:** Degree of static and kinematic indeterminacies,Analysis of fixed beams, continuous beams and propped cantilevers by moment-area theorem and strain energy method, fixed end moments due to different types of loadings, effects of sinking and rotation of supports, bending moment and shear force diagrams for fixed beams and propped cantilevers, slope and deflection of fixed beams, analysis of continuous beams by the three moment theorem (Clapeyron's theorem) due to different types of loadings

### UNIT III

**Rolling Loads:** Introduction to rolling loads and influence lines, Determination of shear force, bending moment at a section and absolute shear force and bending moment due to single point load, uniformly distributed load, several
point loads etc.

**Influence Lines:** Construction of Influence lines for reaction, shear forces and bending moment for simply supported, overhanging and compound beams, influence lines for girders with floor beams, Influence lines for forces in members of frames.

### UNIT IV

**Analysis of Two hinged and Three Hinged Arches:**
Parabolic and circular Arches, Bending Moment Diagram for various loadings, Temperature effects, Rib shortening, Axial thrust and Radial Shear force diagrams

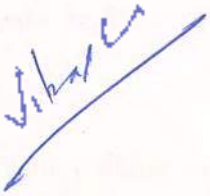
**Cables and suspension Bridges:** Introduction, shape of a loaded cable, cable carrying point loads and UDL, cables with ends at different level, cable subjected to temperature stresses, suspension bridge with two hinged and three hinged stiffening girder.

**Text Books**


1. Elementary Structural Analysis, Norris & Wilbur, McGraw Hill Publisher. 1991
2. Basic Structural Analysis, C.S. Reddy, Tata McGraw Hill Publication.2110
3. C K WANG, " Intermediate Structural Analysis" McGraw Hill Publisher 2014

**Reference Books**


1. Structural Analysis (A unified approach), D.S. Parkash Rao, University Press.1996
2. Theory of structures, Punmia and Jain, Luxmi Publications.2017
3. Structural Analysis Thandvamoorthy TS Oxford University Press 2011
4. Structural Analysis Devdas Menon Narosa Publishing House 2017

## CE – 204 A: FLUID MECHANICS-II
### B. Tech. 2nd Year (Semester – IV)

| L | T | P | Credits |
|---|---|---|---|
| 3 | 1 | -- | 4 |

Class Work : 30 Marks
Examination : 70Marks
Total : 100 Marks
Doration of Examination : 3 Hours

### UNIT-I

**Flow in Open Channels:** Difference between pipe flow and channel flow, Types of channels, Classification of flows, Sub Critical and Supercritical Flows, Velocity distribution in channel, Design of Channels. Most efficient channel sections

**Flow Measurement:** Flow over notches and weirs. Pitot tube floats and current meters for velocity measurement, Flow over Spillways, Sluice gates. Free overfall flow.

### UNIT- II

**Concepts of Specific energy and specific Force:** Specific energy and specific curve, Momentum Equation in open channels, Specific force & specific force curve Critical depth and its computation

**Hydraulic jump:** Froude number and types of hydraulic jump, Applications Jumps in channels. Unsteady flow equation, Pre jump and post jump depths, length of Hydraulic Jump and energy dissipation. Surges

### Unit III

**Gradually Varied Flow:** Channel transitions. Non-uniform flow in open channels, Dynamic equation for GVF. Water surface profiles, GVF flow computations. Design of Channels, Most efficient channel sections

### UNIT-IV

**Flow through pipes:** Types of flows-Reynold's experiment, laminar flow through pipes-Hagen Poiseuille law, shear stress on turbulent flow, boundary layer in pipes-Establishment of flow, velocity distribution for turbulent flow in smooth and rough pipes, resistance to flow of fluid in smooth and rough pipes. Stanton and Moody's diagram. Darcy's weisbach equation, other energy losses in pipes, loss due to sudden expansion, hydraulic gradient and total energy lines, pipes in series and in parallel, equivalent pipe, branched pipe, pipe networks, Hardy Cross method, water hammer

**Books:**


1 Fluid Mechanics by Modi & Seth , Standard Book House, New Delhi 2018

2 Fluid Mechanics Through Problems by R J Garde 2011

3 Engineering Fluid Mechanics by R.J.Garde & A.G.Mirajgaoker 2010

4 Fluid Mechanics A.K.Jain Khanna Publishers, New Delhi 2010

5 Open Channel Hydraulics Van te Chow McGraw Hill 2015

6 Open Channel Hydraulics Subramanya 2015

**Reference books**

1 Introduction to Fluid Mechanics by Robert W.Fox & Alan T McDonald 2011

2 Fluid Mechanics Through Problems by R.J Garde 2011

3 Streeter V.L. , Fluid mechanics, Tata McGraw Hill, 1998

4 Fluid Mechanics John F. Douglas, Gasiorek & Swaffield, Pearson Education 2006

## CE – 206A: GEOMATICS ENGINEERING

**B. Tech. 3rd Year (Semester – IV)**

| L | T | P | Credits |
|---|---|---|---|
| 3 | 0 | -- | 3 |

| | | |
|---|---|---|
| Class Work | : | 30 Marks |
| Examination | : | 70Marks |
| Total | : | 100 Marks |
| Duration of Examination | : | 3 Hours |

### UNIT – I

**Introduction to Geomatic Engineering-** Introduction to map and Geographic coordinate system-Map projections, projected coordinate system, application of coordinate systems, Global positioning system (GPS)- Elements, satellite constellation and signals and GPS measurements

### UNIT - II

**Remote Sensing:** Definition and scope of Remote sensing, Nature and spectrum of Electromagnetic radiation. Reflectance, Transmission and Absorption, Thermal Emission - Plank's formula, Stefan – Boltzman Law, Wein's Displacement Law, Emissivity – Kirchoff's Law: Interaction of EMR with Atmosphere Scattering, Refraction, Absorption, Transmission Atmospheric Windows, Interaction of EMR with Earth Surface: Spectral Reflectance Curves, Interaction of earth surface with EM radiation in visible, Near Infrared, Thermal Infrared and Microwave regions Idealised & Real sequence of remote sensing.

### UNIT III

**Remote sensing- Platforms and sensors:** Platforms, Orbital characteristics, sensor parameters- spatial resolution, spectral resolution, radiometric resolution, Storage and Retrieval of data
Indian Remote Sensing satellite systems- Introduction, Stages of development. Sensors, Types of scanning system.

**Data Processing:** Initial data statistics. Pre-processing – Atmospheric, Radiometric and Geometric corrections. Image Histogram, Classification of images and interpretation.
Application- Application of remote sensing to various engineering fields.

### UNIT – IV

**Geographical Information system (GIS):** Definition, and Components, Geographical data: types and characteristics, Spherical and plane coordinate systems in GIS, geo-referencing, Digital representation of geographic data: Data structure, spatial data model, raster and vector models; GIS data standards concepts and components, Integration of Remote sensing and GIS; GIS project design and planning methodologies, GIS data base management systems; Application of GIS in civil engineering

**Text Books**

1 Geomatic Engineering, Manoj K Arora, RC Badjatiya, Nem Chand & Bros 2009

2 Remote Sensing and Image Interpretation, by Lillisand, T.M. & Kiefer R.W., John Wiley and Sons. 2015
3. Introduction to Remote Sensing, by Campbell, J.B. Taylor and Francis.2007
4. Principles of Geographic information systems, Burrough, P.A and MacDonnel, R a , Oxford University press 2016
5 Concepts and Techniques of GIS, C.P.Lo,Albert K.W.Yeung, PHI 2009

**Reference Books**

1 Digital Remote Sensing, by Nag. P. & Kudrat, M. Concept Publication Company.1998
2 Remote Sensing and Photogrammetry - Principles and Applications, by Jhanwar, M.L. and Chouhan, T.S. Vigyan Prakashan, Jodhpur 2004

## BT CE- 208A: TRANSPORTATION ENGINEERING – I

**B. Tech. 2nd Year (Semester – IV)**

| L | T | P | Credits |
|---|---|---|---|
| 3 | 1 | – | 4 |

**Class Work** : **30 Marks**
**Examination** : **70 Marks**
**Total** : **100 Marks**
**Duration of Examination** : **3 Hours**

### UNIT – I

**Highways development Planning:** Introduction, Different modes of transport, Development of Transport System. Phased development of Roads in India. Highway Surveys & Alignment, Design, Drawings, Estimates & Project Report.

**Highway materials and testing** sub grade, sub base and base course materials, bituminous materials, testing of soil, aggregate and bitumen

### UNIT – II

**Geometric Design of Highways:** Introduction, Highways Classification, Right of way, Land width, width of formation, width of pavement, Sight Distances, camber, horizontal and vertical Road Curves, Transition Curves.

**Design of Pavements** Types of pavements, Factors affecting design of pavements, wheel load factor, Climatic Factors. Structure of Flexible pavement, Function of various components of Flexible pavement, design of flexible pavements by G.I. & CBR methods, stresses in rigid pavements, design of rigid pavements by IRC method.

### UNIT – III

**Traffic Studies:** Road user characteristics, Importance of traffic studies, spot speed, speed and delay and origin and destination studies Vehicular flow models Stream variables: Spacing and concentration, headway and flow, mean speed. Time distance diagram of flow. Traffic operations and control devices, intelligent transport systems.

**Road Safety Audits** Road Safety Audits: Safety concerns in highway projects, Systems approach, various stages of Safety Audit, Preparation of Audit Reports

### UNIT – IV

**Highway construction** road types--earth roads, gravel roads, water bound macadam, bituminous pavement including surface treatment, premix carpet, mastic asphalt, bituminous macadam, bituminous concrete and cement concrete roads Construction of earth, gravel and water bound macadam roads, Construction Equipments.

**Maintenance:** Introduction. Maintenance of Earth, gravel, WBM, GSB, WMM Roads, Bituminous Roads. Maintenance of berms, Side Slopes. Pavement edge and draining work. Failures of flexible and rigid pavements: Maintenance, evaluation and its strengthening.

**Text Books**

1 Highway Engineering by Khanna and Justo, Nem Chand & Brothers, Roorkee 2015
2 Highway Engineering by L R Kadyali, Nem Chand & Brothers, Roorkee 2015

**Reference Books**

1 Highway Engineering by Oglesby and Hews 2010
2. Transportation Engineering by G V Rao, Tata McGraw Hill Publisher, New Delhi 2009

## BT CE – 218A: MECHANICAL ENGINEERING

**B. Tech. 2nd Year (Semester – IV)**

| L | T | P | Credits |
|---|---|---|---|
| 3 | -- | -- | 3 |

| | | |
|---|---|---|
| Class Work | : | 30 Marks |
| Examination | : | 70 Marks |
| Total | : | 100 Marks |
| Duration of Examination | : | 3 Hours |

### UNIT-I

**THERMODYNAMICS** – Elementary definitions in thermodynamics, fundamentals of first and 2nd law of thermodynamic, concept of internal energy, enthalpy and entropy, heat pump and refrigerator, elementary numerical problems.

**PROPERTIES OF STEAM & BOILERS:** properties of steam, use of steam tables and mollier diagram , measurement of dryness fraction of steam, Carnot and Rankin cycle, elementary numerical problems. Classification of boilers. Comparison of water and fire tube boilers mounting and accessories with their functions, Constructional and operational details of Cochran and Babcock and Wilcox boilers, elementary numerical problems.

**STEAM TURBINES AND CONDENSERS:** Classification of turbines and their working principles, Types of condensers and their uses

### UNIT-II

**I.C. ENGINES AND GAS TURBINES:** Introduction, Classification, Constructional details and working of two-stroke and four-stroke diesel and petrol engines, Efficiency of Otto & Diesel cycles , Working principle of gas turbine, elementary numerical problems

**REFRIGERATION AND AIR CONDITIONING-** rating of refrigeration machine, coefficient of performance, simple vapor compression cycle, fundamentals of air conditioning, use of Psychrometric charts.

### UNIT-III

**WATER TURBINES AND PUMPS :** Introduction, Classification, Construction details and working principle of Pelton, Francis and Kaplan turbines,

Classification of water pumps.

**SIMPLE LIFTING MACHINES:** Definition of machine, Velocity ratio, Mechanical advantage, Efficiency, Laws of machines, Reversibility of machine, Wheel and axle, Differential pulley block, Single, double and triple start worm and worm wheel, Single and double purchase winch crabs, Simple and compound screw jacks, elementary numerical problems.

## UNIT-IV

**INTRODUCTION TO POWER TRANSMISSION AND DEVICES:** Belt drive, Rope drive, Chain drive, Types of gear and Gear train, Types and function of clutches, Types and function of brakes

**STRESSES AND STRAIN S:** Introduction, Concept & types of Stresses and strains, Poison's ratio, stresses and strains in simple and compound bars under axial loading, Stress-strain diagrams, Hooks law , Elastic constants & their relationships Concept of shear force and bending moments in beams, elementary numerical problems.

**TEXT BOOKS:**


1. Hydraulic and Fluid Mechanics – Modi and Seth, Pub. – Standard Book House, New Delhi 2018
2. Engineering Thermodynamics – C.P. Arora, Pub - TMH, New Delhi 2017
3. Thermal Engineering - A.S Sarad, Pub - Satya Prakashan, New Delhi. 2016
4. Engineering Mechanics – K.I. Kumar, Pub. - TMH, New Delhi. 2017
5. Theory of Machines - S S. Rattan, Pub. – TMH. New Delhi. 2017


**Reference Books:**


1. Basic Mechanical Engineering by Pravin Kumar, Pearson
2. Fundamental of Mechanical Engineering by G.S. Sawhney, PHI Publication New Delhi
3. Elements of Mechanical Engineering by Sadhu Singh S. Chand Publication

## BT CE – 210A: STRUCTURAL ANALYSIS-I LAB

**B. Tech, 2nd Year (Semester – IV)**

| L | T | P | Credits |
|---|---|---|---|
| -- | -- | 2 | 1 |

**Class Work** : 30 Marks
**Examination** : 70 Marks
**Total** : 100 Marks
**Duration of Examination** : 3 Hours

---

**List of Experiments:**

1. To verify Betti's Law
2. To determine the flexural rigidity (EI) of a given beam.
3. To verify Moment-Area Theorems for slope and deflection of a beam.
4. To study the behavior of different types of struts.
5. To determine the elastic displacement of curved members.
6. To determine the horizontal displacement of the roller end in a curved beam.
7. To make computer programs for theoretical verification of the above experiments.

## BT CE -212A: FLUID MECHANICS-II LAB

**B. Tech. 2nd Year (Semester – IV)**

| L | T | P | Credits |
|---|---|---|---|
| -- | — | 2 | 1 |

| | | |
|---|---|---|
| **Class Work** | : | **30 Marks** |
| **Examination** | : | **70 Marks** |
| **Total** | : | **100 Marks** |
| **Duration of Examination** | : | **3 Hours** |

---

**List of Experiments:**

1. To determine Manning's co-efficient of roughness for the rough bed of a given flume.
2. To measure the velocity distribution in a rectangular channel by Prandtl Pitot tube and to determine the energy correction factors
3. To study the flow through a horizontal contraction in a rectangular open channel.
4. To calibrate a current meter
5. To study the formation of hydraulic jump in a horizontal rectangular open channel (Measurement of Froude no. and energy loss)
6. To study the flow over a hump in a channel bed.
7. To study the pressure distribution along the spillway surface for different heads.
8. To calibrate a broad-crested weir and to study the pressure distribution along its surface.
9. To study the flow under a sluice gate and formation of hydraulic jump at different Froude no.

## BT CE – 214A: GEOMATICS ENGINEERING LAB

B. Tech. 2nd Year (Semester – IV)

| L | T | P | Credits |
|---|---|---|---|
| -- | -- | 2 | 1 |

Class Work : 30 Marks

Examination : 70 Marks

Total : 100 Marks

Duration of Examination : 3 Hours

---

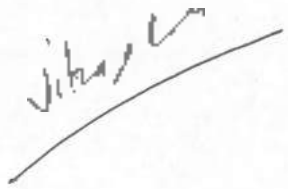
**List of Experiments**

1 Study and image interpretation of remote sensing data

2 Introduction to CAD/GIS/Image Processing software

3 Study of digital image characteristics such as

- DN value,
- Histogram,
- Color image generation,
- Simple Image enhancement,
- On-screen digitization from images.
- Area computation,
- Geo-registration of images etc.



## BT CE- 216A : TRANSPORTATION ENGINEERING-I LAB

**B. Tech. 3rd Year (Semester – IV)**

| L | T | P | Credits |
|---|---|---|---|
| -- | -- | 2 | 1 |

| | | |
|---|---|---|
| **Class Work** | : | **30 Marks** |
| **Examination** | : | **70 Marks** |
| **Total** | : | **100 Marks** |
| **Duration of Examination** | : | **3 Hours** |

---

**List of Experiments:**

1. To test toughness of road Aggregates by Impact Test
2. To test hardness of aggregates by Los Angles Abrasion Test
3. To perform Crushing Strength Test on Aggregates
4. To identify grade of bitumen using Penetration Test
5. To test the ductility of bitumen using Ductility test
6. To test water absorption and specific gravity of road aggregates using density basket.
7. To find out Softening Point of Bitumen.
8. To find out Flash & fire point of bitumen.
9. To determine spot speed of traffic by radar speedometer and endoscope
10. To conduct CBR test on samples of subgrade.
11. To perform classified traffic Volume count on a road section.

**Annexure-XII**


सत्यमेव जयते

विश्वविद्यालय अनुदान आयोग
University Grants Commission
मानव संसाधन विकास मंत्रालय, भारत सरकार
(Ministry of Human Resource Development, Govt. of India)
बहादुरशाह जफर मार्ग नई दिल्ली – 110 002
Bahadurshah Zafar Marg, New Delhi-110002
Phone : 011-23406308, 011-23406309

ज्ञान-विज्ञान विमुक्तये


**Speed Post**

**F.No.81-1/2019 (CU)** **18th January, 2019**

The Registrar
All Central Universities (40)
Fully funded Deemed to be Universities (8)
Principal of Delhi Colleges (54)
Principal of BHU Colleges (4)
Principal of Constituent Colleges of University of Allahabad (11)
(As per list enclosed)

18 JAN 2019

**Subject : Reservation for Economically Weaker Sections (EWSs) for admission in Central Educational Institutions.**

Sir/Madam,

I am directed to enclose herewith a copy of the MHRD Office Memorandum No.12-4/2019-U1 dated 17th January, 2019 regarding the implementation of reservation for Economically Weaker Sections (EWSs) for admission in Central Educational Institutions, in accordance with One Hundred and Third Amendment of Constitution of India, for its immediate implementation and compliance.

You are requested to implement the above mentioned instructions from the academic session 2019-2020. The scheme for implementing the reservation for the EWS shall be displayed on the website of the institution as soon as possible.

You are further requested to furnish the seat matrix, programme wise, along with possible financial requirements to UGC before 31st January, 2019.

Yours faithfully,

**(Dr. Jitendra K. Tripathi)**
**Joint Secretary**

**Encl.: As above.**

(i) Ms. Smita Srivastava, Director, Government of India, Ministry of Human Resource Development, Department of Higher Education, Shastri Bhawan, New Delhi-110001.
(ii) JS (DU)/JS (DC) for information.
(iii) Publication Officer for uploading on the UGC website.

**(Dr. Jitendra K. Tripathi)**
**Joint Secretary**

**F No: 12-4/2019-U1**
**Government of India**
**Ministry of Human Resource Development**
**Department of Higher Education**
*****

Shastri Bhawan, New Delhi
Dated: 17th January, 2019

## OFFICE MEMORANDUM

**Subject: Reservation for Economically Weaker Sections (EWSs) for admission in Central Educational Institutions.**

In accordance with the provisions of the Constitution (One Hundred and Third Amendment) Act 2019, and the reference of Ministry of Social Justice and Empowerment vide OM No. 20013/01/2018-BC-II dated 17th January 2019, enabling provision of reservation for the Economically Weaker Sections (EWSs) who are not covered under the existing scheme of reservations for the Scheduled Castes, the Scheduled Tribes and the Socially and Educationally Backward Classes, it has been decided to provide reservation in admission to educational institutions subject to a maximum of ten per cent of the total seats in each category. This would not apply to the minority educational institutions referred to in clause (1) of Article 30 of the Constitution of India.

2. The provision of reservations to the Economically Weaker Sections shall be in accordance with the directions contained in the OM No. 20013/01/2018-BC-II dated 17th January 2019 of the Ministry of Social Justice & Empowerment and shall be subject to the following:

a) The reservations shall be provided to EWSs for admission in Central Educational Institutions, (as defined in clause (d) of section (2) of The Central Educational Institutions (Reservation in Admission) Act, 2006) from the academic year 2019-20 onwards.
b) The above reservation would not be applicable to the 8 institutions of excellence, research institutions, institutions of national & strategic importance as specified in the Schedule to The Central Educational Institutions (Reservation in Admission) Act, 2006, as amended from time to time, and appended to this OM, and to the minority educational institutions referred to in clause (1) of article 30 of the Constitution.
c) Every Central Educational Institution shall, with the prior approval of the appropriate authority (as defined in clause (c) of section 2 of The Central Educational Institutions (Reservation in Admission) Act, 2006), increase the number of seats over and above its annual permitted strength in each branch of

17/1/19

study or faculty so that the number of seats available, excluding those reserved for the persons belonging to the EWSs, is not less than the number of such seats available, in each category, for the academic session immediately preceding the date of the coming into force of this O.M.

d) Where, on a representation by any Central Educational Institution, the appropriate authority is satisfied that for reasons of financial, physical or academic limitations or in order to maintain the standards of education, the annual permitted strength in any branch of study or faculty of such institution cannot be increased for the academic session following the commencement of this Act, it may permit such institution to increase the annual permitted strength over a maximum period of two years beginning with the academic session following the commencement of this Act; and then, the extent of reservation for the Economically Weaker Sections shall be limited for that academic session in such manner that the number of seats made available to the Economically Weaker Sections for each academic session shall not reduce the number and the percentage of reservations provided for SC/ST/OBC categories.

e) The scheme for implementing the reservation for the EWS shall be displayed on the website of the institution as soon as possible, but no later than 31st March 2019.

3. The Chairman UGC, Chairman AICTE and Chairperson NCTE and the Bureau Heads of the Department of Higher Education in the Ministry of Human Resource Development responsible for management of the Institutions of National Importance are requested to ensure immediate compliance of this OM.

4. This issues with the approval of the Minister for Human Resource Development.

Encl: As above

12/1/19

**(Smita Srivastava)**
**Director**

1. **Chairman UGC**
2. **Chairman AICTE**
3. **Chairperson NCTE**
4. **All Bureau Heads of Department of Higher Education**

**Copy to:**

**Chief Secretaries of all State Governments/UTs:** with a request to give effect to the provisions of the Constitution (One Hundred and Third Amendment) Act, 2019 for all higher educational institutions funded/aided, directly or indirectly, by the State Government in such manner that the provision for reservation for EWS would become operational from the academic year 2019-20.

मानव-विज्ञान विभूतये
प्रो. रजनीश जैन
सचिव
Prof. Rajnish Jain
Secretary

सत्यमेव जयते

विश्वविद्यालय अनुदान आयोग
University Grants Commission
(मानव संसाधन विकास मंत्रालय, भारत सरकार)
(Ministry of Human Resource Development, Govt. of India)
बहादुर शाह जफर मार्ग, नई दिल्ली-110002
Bahadur Shah Zafar Marg, New Delhi-110002
Ph.: 011-23236288/23239337
Fax : 011-2323 8858
E-mail : secy.ugc@nic.in

**No.F.25-1/2018(PS/MISC.)** **28th January, 2019**

To,

The Registrar
All Universities

**Subject: Revised guidelines for enhancement of the Rates of Honorarium of Guest Faculty.**

Madam/Sir,

The Commission in its 537th meeting held on 10th December, 2018 considered the issue of enhancement of the rates of Honoranum of Guest Faculty in universities and colleges consequent upon the implementation of the recommendations of the 7th Pay Commission and resolved as follows :

1. The Honorarium for Guest Faculty be enhanced to Rs.1500/- per lecture subject to a maximum of Rs.50,000/- per month.

2. The Guest Faculty be appointed only against sanctioned post. However, for the universities where the sanctioned posts are not adequate as per the teaching working load, the number of Guest Faculty to be appointed can be up to 20% over and above the sanctioned posts.

3. The qualification for Guest Faculty shall be the same as those prescribed for the regular Assistant Professors of Universities/Colleges in UGC Regulations.

4. The Selection procedure for appointing Guest Faculty shall be the same as those of regularly appointed Assistant Professors. However, the composition of the Selection Committee shall be as follows:

   (i) The Vice-Chancellor or his/her nominee shall be the Chairperson of the Selection Committee
   (ii) One expert in the concerned subject nominated by the Vice-chancellor.
   (iii) Dean of the concerned Faculty: wherever applicable
   (iv) Head/Chairperson of the Department/School

Contd. 2

(v) An academician representing SC/ST/OBC/Minority/Women/Differently-abled categories to be nominated by the Vice-Chancellor or Acting Vice-Chancellor, if any of the candidates representing these categories is the applicant and if any of the above members of the Selection Committee does not belong to that category.

At least four members, including one outside subject expert shall constitute the quorum.

5. Guest Faculty will not be treated like regular teachers for the purpose of voting rights or for becoming the members of the various statutory bodies of the university.

6 The superannuated teachers may also be considered for engagement as Guest Faculty subject to a maximum age limit of 70 years.

7. The Guest Faculty will not be given the benefit of allowances, pension, gratuity and leave etc. as admissible to the regular teachers.

**These guidelines will come into force with effect from the date of issue of this letter.**

The contents of the letter may be brought to the notice of the affiliated colleges/institutions also.

Yours faithfully,

**(Rajnish Jain)**
**Secretary**

Copy to :

1. All State Higher Education Secretaries.
2. All Regional Offices of the UGC.
3. Publication Officer, UGC for uploading on UGC website.

# Central University of Haryana, Mahandergarh

## Department of Printing and Packaging Technology

## School of Engendering and Technology

## Proceeding/ minutes of the BOS held on 13.02.2019

**The meeting of the board of studies was held on 13.02.2019 at 10 a.m. The following were present**

1. **Dr. Ajay Kumar Bansal, Dean and Chairman**
2. ***Prof. A.K. Baral, GJUS&T, Hisar***
3. **Mr. Tarun Singh**
4. **Mr. Shammi Mehra**
5. **Mr. Amit Kumar**

Following points were disused and approved

1. The scheme and the syllabus 3rd and 4th semester of B.Tech (Printing and Packaging Technology) (Annexure-1.)
2. The list of paper setters and practical examiners for the 4th and 6th of B.Tech (Printing and Packaging Technology) (Annexure-2.)

13/2/19

**Dr. Ajay Kumar Bansal, Dean and Chairman**
Hisar

13.02.19

**Prof. A.K. Baral, GJUS&T.**

13/02/2019

**Mr. Tarun Singh**

13/02/19

**Mr. Shammi Mehra**

13/02/19

**Mr. Amit Kumar**

# Scheme & Syllabus for B.Tech in Printing and Packaging Technology according to Choice Based Credit System (CBCS)

## (Semester III to Semester IV)

## Department of Printing and Packaging Technology
## (Batch 2018-19 onwards)

## School of Engineering & Technology

## CENTRAL UNIVERSITY OF HARYANA
## MAHENDERGARH-123031
## HARYANA

**Department of Printing and Packaging Technology**
**Central University of Haryana, Mahendergarh**
**B.Tech. 2nd YEAR (SEMESTER – III)**
**Choice Based Credit System Scheme of Studies & Examinations w.e.f. 2019-20**

| Sl. No. | Course Code | Course Title | Teaching Schedule | | | Marks of Class work | Examination Marks | | Total | Credits | Duration of Exam |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Theory | Practical | | | |
| | | | L | T | P | | | | | | |
| 1 | BT PPT 301A | Basics of Printing Technology | 3 | 1 | 0 | 30 | 70 | 0 | 100 | 4 | 3 |
| 2 | BT PPT 302A | Basics of Packaging Technology | 3 | 1 | 0 | 30 | 70 | 0 | 100 | 4 | 3 |
| 3 | BT PPT 303A | Printing Process Lab. | 0 | 0 | 2 | 30 | 0 | 70 | 100 | 1 | 3 |
| 4 | BT PPT 304A | Electronic composition | 3 | 1 | 0 | 30 | 70 | 0 | 100 | 4 | 3 |
| 5 | BT PPT 305A | Electronic Composition Lab | 0 | 0 | 2 | 30 | 0 | 70 | 100 | 1 | 3 |
| 6 | BT PPT 306A | Printing & Packaging Materials Science-I | 3 | 1 | 0 | 30 | 70 | 0 | 100 | 4 | 3 |
| 7 | BT PPT 307A | GEC | 3 | 1 | 0 | 30 | 70 | 0 | 100 | 4 | 3 |
| 8 | BT AUD 308A | Environment Studies | 3 | 0 | 0 | 30 | 70 | 0 | 100 | 0 | 3 |
| **Total** | | | **18** | **05** | **04** | **240** | **420** | **140** | **800** | **22** | **24** |

**L= Lecture, T = Tutorial, P = Practical, AUD = Audit Course, & C = Credits, GEC = Generic Elective Course**

**NOTE**: Examinees will be allowed to use only non-programmable scientific calculators in the examination. Other electronic gadgets and sharing of materials will not be permitted during the examinations.

- GEC to be taken from other department.

List of GEC (General Elective Course) "For Students of Other Departments"

1. Basics of Printing and Packaging Technology- BT PPT 307A

**Department of Printing and Packaging Technology**
**Central University of Haryana, Mahendergarh**
**B.Tech. 2nd YEAR (SEMESTER – IV)**
**Choice Based Credit System Scheme of Studies & Examinations w.e.f. 2019-20**

| Sl. No. | Course Code | Course Title | Teaching Schedule | | | Marks of Class work | Examination Marks | | Total | Credits | Duration of Exam |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | L | T | P | | Theory | Practical | | | |
| 1 | BT PPT401A | Offset Technology | 3 | 0 | 0 | 30 | 70 | | 100 | 3 | 3 |
| 2 | BT PPT402A | Offset Technology Lab | 0 | 0 | 2 | 30 | 0 | 70 | 100 | 1 | 3 |
| 3 | BT PPT403A | Packaging Process-I | 3 | 1 | 0 | 30 | 70 | 0 | 100 | 4 | 3 |
| 4 | BT PPT404A | Packaging Process-I Lab | 0 | 0 | 2 | 30 | 0 | 70 | 100 | 1 | 3 |
| 5 | BT PPT405A | Essentials of Management | 3 | 0 | 0 | 30 | 70 | | 100 | 3 | 3 |
| 6 | BT PPT 406A | Printing & Packaging Materials Science-II | 3 | 1 | 0 | 30 | 70 | 0 | 100 | 4 | 3 |
| 7 | BT PPT 407A | Costing, Estimating and ERP | 3 | 0 | 0 | 30 | 70 | 0 | 100 | 3 | 3 |
| 8 | BT PPT 408A | Printing & Packaging Materials Testing Lab | 0 | 0 | 2 | 30 | 0 | 70 | 100 | 1 | 3 |
| 9 | BT PPT 409A | GEC | 3 | 1 | 0 | 30 | 70 | 0 | 100 | 4 | 3 |
| 10 | BT AUD 410A | Indian Constitution | 3 | 0 | 0 | 30 | 70 | 0 | 100 | 0 | 3 |
| **Total** | | | **21** | **03** | **06** | **300** | **490** | **210** | **1000** | **24** | **30** |

**L= Lecture, T = Tutorial, P = Practical, AUD = Audit Course, & C = Credits, GEC = Generic Elective Course**

Note: Examinees will be allowed to use only non-programmable scientific calculators in the examination. Other electronic gadgets and sharing of materials will not be permitted during the examinations.

- GEC to be taken from other department.

List of GEC (General Elective Course) "For Students of Other Departments"

1. Printing and Packaging Materials- BT PPT 409A

# Basics of Printing Technology (BT PPT 301A)

Course Title : Basics of Printing Technology
Course Code : BT PPT 301A

| L | T | P | Credits |
|---|---|---|---|
| 3 | 1 | 0 | 4 |

Class-work Marks : 30
Exam Marks : 70
Total Marks : 100
Duration of Examination : 3 Hours

**Course Objectives:**

- To study about the history of printing.
- To study about different developments in printing.
- To study about different printing process.
- To study about basic operation in printing.

**Unit: I**

Brief history of printing in the western countries and India. A brief survey of the evolution of printing processes and methods from to the present day technology. Introduction to printing processes, basic principles, characteristics, identification and application of letter press, flexography, offset, gravure, screen and Electrostatic printing etc. Suitability and limitations of various processes of printing. Equipment and tool used for relief printing processes.

**Unit: II**

Letterpress machines: Classification, types of platen, cylinder and Rotary presses their working principles, inking com common printing defects, causes and their remedies.

Lithographic printing process: Introduction, characteristics of lithographic printing, classification of offset printing, different units of offset machine, pre-make ready & make-ready steps, machine production, introduction of offset plates, inks & substrates.

**Unit: III**

Flexography printing process: Introduction, characteristics of flexography, components of flexo press, flexo plates, flexo presses, introduction to flexo inks & substrates. Gravure printing process: Introduction, characteristics of Gravure, Principles of Gravure printing, basic components of gravure press, brief introduction to image carrier preparation for Gravure printing, Gravure ink & substrate.

**Unit: IV**

Screen printing process: Introduction, application of screen printing, tools, equipment's & accessories used in screen printing, Stencils – knife cut stencils, photo stencils – Indirect stencil systems, direct photo stencil systems, capillary systems, and direct/indirect photo stencil systems screen printing process steps, Introduction to screen inks, substrates & image carriers. Digital printing: Introduction, various, digital printing technologies & Brief introduction to digital inks & substrates.

**Reference Books:**


1. "Flexography: Principles & Practices", 5th Edition, FTA, 2000.
2. "FIRST: Flexographic Image Reproduction Specifications & Tolerances", 3rd Edition, FTA, 2003.
3. Samuel B. Hoff, "Screen Printing – A Contemporary Approach", Delmar Publishers, 1997.
4. Ingram, Samuel, "Screen Printing Primer", GATF press, 2nd Edition, 1999.
5. Handbook of Printing Processes (GATF publications) by Deborah L Stevenson (Author), Charles Lucas (Illustrator)
6. Printing Technology 5th edition, Publisher: Delmar, 2002
7. The Gutenberg Revolution: How Printing Changed the Course of History.


**Course Outcomes:**

- Students know about the invention of printing.
- Students know about the developments of printing.
- Students know about different printing processes.

**Note:**

- The paper setter will set a first compulsory question comprising of 6 to 10 sub parts (short questions), covering the entire syllabus and two questions (with/without parts) from each unit. The examinee will attempt five questions in all, along with the compulsory question (with all it sub parts), selecting one question from each unit. All questions will carry equal marks i.e. 14 marks each.
- The use of programmable devices such as programmable calculators etc. is not allowed during the exam. Sharing of materials will not be permitted during examination.

## Basics of Packaging Technology (BT PPT 302A)

Course Title : Basics of Packaging Technology
Course Code : BT PPT 302A

| L | T | P | Credits |
|---|---|---|---|
| 3 | 1 | 0 | 4 |

| | |
|---|---|
| Class-work Marks | : 30 |
| Exam Marks | : 70 |
| Total Marks | : 100 |
| Duration of Examination | : 3 Hours |

**Course Objectives:**

- To study about different packaging element of packaging.
- To study about different developments in packaging.
- To study about different packaging processes.
- To study about basic operation in printing.

**Unit: I**

Basics of Packaging: Definition and historical back ground, purposes and functions of packaging, Packaging media, Mechanical, chemical and biological protective functions of packaging, odour and flavor contamination, shelf life, Interaction between package and its contents, Types of packaging.

**Unit: II**

Packaging Design: Consumer research and sales promotion through package design, Factors influences design, Surface design to suit production limitations, Consideration of design and marketing.

**Unit: III**

Packaging Technology: Paper based packaging; applications, advantages and limitations, Glass and plastic based packaging; applications, advantages and limitations, Wood, jute and textile based packaging; applications, advantages and limitations.

**Unit: IV**

Packaging Materials: Paper and board; Characteristics and uses performance requirements – grammage, caliper, stiffness, bursting strength, surface finish etc. Different kinds of fiber boards: Solid boards, corrugated boards, conversion properties, advantages and limitations, Cellulose film: properties, manufacturing, applications, and limitations, Plastic based packaging materials: Different materials, applications and limitations, Flexible packaging materials: Different materials used, flexible laminates, various combinations and applications, characteristics and limitations, Metal bases packaging materials; kind's applications, advantages and limitations.

**Reference Books:**

1. The Big Book of Packaging - Mr. Sandeep Kumar Goyal
2. The Eight Elements of Powerful Package Design Paperback – November 19, 2013 by Fumi Sasada (Author), Giles Murray

**Course Outcomes:**

- Students know about the invention of packaging.
- Students know about the element and principal of package design.
- Students know about the developments of packaging.
- Students know about different packaging processes.

**Note:**

- The paper setter will set a first compulsory question comprising of 6 to 10 sub parts (short questions), covering the entire syllabus and two questions (with/without parts) from each unit. The examinee will attempt five questions in all, along with the compulsory question (with all it sub parts), selecting one question from each unit. All questions will carry equal marks i.e. 14 marks each.
- The use of programmable devices such as programmable calculators etc. is not allowed during the exam. Sharing of materials will not be permitted during examination.

## Printing Process Lab (BT PPT303A)

Course Title : Printing Process Lab
Course Code : BT PPT303A

| L | T | P | Credits |
|---|---|---|---|
| 0 | 0 | 2 | 1 |

Class-work Marks : 30
Exam Marks : 70
Total Marks : 100
Duration of Examination : 3 Hours

**List of Experiments:**

1. Identification of different tools & equipment used in various printing process.
2. Introduction of different printing process.
3. Schematic diagram of different printing processes.
4. Study of various types of Image carriers for different printing process.
5. Overview pre-make ready & make ready.
6. Study of different printing press.
7. Overview of machine production for multi-color printing.
8. Study of running & printing faults on different printing process machine.

## Electronic Composition (BT PPT 304A)

Course Title : Electronic composition
Course Code : BT PPT 304A

| L | T | P | Credits |
|---|---|---|---|
| 3 | 1 | 0 | 4 |

| | |
|---|---|
| Class-work Marks | : 30 |
| Exam Marks | : 70 |
| Total Marks | : 100 |
| Duration of Examination | : 3 Hours |

**Course Objective**

- To know about different computer input and output devices.
- To know about pre-press for copy preparation.
- To know about DTP software

**Unit: I**

Preparing copy for press. Input output devices: keyboards, mouse, light pen, touch screen, desktop scanners, pointing device, and automatic-voice recognition. Optical character recognition: working principle, factors affecting performance. Proofing, different proofs, proofing stages, proof correction marks, correction of type set matter.

**Unit: II**

Basic principle, image setter Small, Medium and Large format image setters. Computer to film and computer to plate processing, environmental issues, other factors. Page description languages. Post Script Language – Introduction. PostScript Fundamentals-Structure of PS file. Adobe acrobat, reader and Distiller.

**Unit: III**

Desk Top Publishing: introduction, Origin, components of DTP, applications of DTP. Benefits of DTP. Developments of DTP. Software for DTP – word processing, Graphic programs. Illustration programs, Business Graphics, CAD design programs, Type manipulation software, OCR software, Image software. Presentation graphics. Image editing software: Image editing commands-crop, marquee tools, cloning tool, cut & paste, image filters. Page make up software – approach, typography, document & text handling, applications. Standard program features – Adobe PageMaker, Corel Draw, and Quark Xpress. Hardware & software for colour. Peripherals & add ones – front–end peripherals, graphics tablets, scanners for text, line art & images, video digesters. DTP as a typesetting front end – distributed desktop, Exploring MS- Office.

Unit: IV

Digital Fonts, True type fonts, Post Script Type 1, Bitmapped fonts, Adobe type manager, Transferring fonts, Font manipulation software, Vector & Bitmap text and Graphic creation, Raster Image Processing, Digital O/P, Creation of type for digital system, Future trends and developments.

**Reference Books:**


1. Desk Top Publishing 4th edition – Kirty wilson, Davis, Ron Strutt.
2. Typesetting-Composition-Geoff, Barlow
3. Word Processor to Printed Page - Micheal Card
4. Digital Typography-Donald E.Knuth Introduction to Prepress - High Speirs
5. Introduction to Printing Technology - Hugh Speirs Composing and Typography Today - Mendiratta.B.D. Hand Book of Typography - Kailas Takle. Guide to DTD-James Cavuoto
6. Printing Technology - Adams Printing in a Digital World – David Bergsland


**Course outcomes:**

- The students will be able to prepare a copy/dummy in prepress.
- Read about proofing and correct the mistake in before OK to print.
- Use the input and output devices for printing.

**Note:**

- The paper setter will set a first compulsory question comprising of 6 to 10 sub parts (short questions), covering the entire syllabus and two questions (with/without parts) from each unit. The examinee will attempt five questions in all, along with the compulsory question (with all it sub parts), selecting one question from each unit. All questions will carry equal marks i.e. 14 marks each.
- The use of programmable devices such as programmable calculators etc. is not allowed during the exam. Sharing of materials will not be permitted during examination.

## Electronic Composition Lab. (BT PPT 305A)

Course Title : Electronic composition
Course Code : BT PPT 305A

| L | T | P | Credits |
|---|---|---|---|
| 0 | 0 | 2 | 1 |

Class-work Marks : 30
Exam Marks : 70
Total Marks : 100
Duration of Examination : 3 Hours

**List of Experiments:**

1. Familiarizing with Key Board.
2. M.S. Word – Commands, designing and practicing.
3. Adobe Illustrator – Commands, designing and practicing.
4. Photo Shop – Commands, designing and practicing.
5. CorelDraw – Commands, designing and practicing.
6. Working of Digital printing.
7. Working with DTP.
8. Few new design software.

## Printing & Packaging Materials Science-I (BT PPT 306A)

Course Title : Printing & Packaging Materials Science-I
Course Code : BT PPT 306A

| L | T | P | Credits |
|---|---|---|---|
| 3 | 1 | 0 | 4 |

Class-work Marks : 30
Exam Marks : 70
Total Marks : 100
Duration of Examination : 3 Hours

**Course Objectives:**

- To study about polymer materials.
- To study about surface chemistry.
- To study about various substrates and metals.

**Unit: I**

Polymers: Monomers and polymers, photopolymers and copolymers. Type of polymerization reactions-addition and condensation, mechanism. Type of polymer-plastic, rubber and fibres, mechanical properties, Chemical properties, vulcanization of rubber. Composition and characteristic of polymers-printing ink, resin, vehicles, adhesive, and film base cellulose and gelatin.

**Unit: II**

Colloids and Surface Characteristics: Kinds, characteristics and properties, application in printing industry. Surface Tension, contact angles and capillary action.

**Unit: III**

Substrate: Fibrous and non-fibrous raw material used in paper and board, their relative properties. Varieties of paper and board, characteristic, classification and testing-mechanical, optical. Other substrates-metal foil, plastic, cellulose, synthetics. Brief description of machine, steps of pulping process, sizing, improvement of properties, calendaring, and coating-materials required.

**Unit: IV**

Metals and Alloys: Steel, Nickel, Chromium, Aluminum Electroplating, Galvanizing Alloy. Heat treatment of Steel.

**Reference Books:**


1. Printing Science - L C Young.
2. Printing Materials - Bob Thompson.
3. Printing Material - Prakash Shetty
4. Material for printing process by Focal Publishers.
5. Advance Science for Learning.

**Course Outcomes:**

- Students know about the application of science in printing and packaging.
- Students know about application of colloids & role of surface chemistry in printing.
- Students know about various substrates and metals used in printing.

**Note:**

- The paper setter will set a first compulsory question comprising of 6 to 10 sub parts (short questions), covering the entire syllabus and two questions (with/without parts) from each unit. The examinee will attempt five questions in all, along with the compulsory question (with all it sub parts), selecting one question from each unit. All questions will carry equal marks i.e. 14 marks each.
- The use of programmable devices such as programmable calculators etc. is not allowed during the exam. Sharing of materials will not be permitted during examination.

## Basics of Printing and Packaging Technology (BT PPT 307A)

Course Title : Basics of Printing and Packaging Technology
Course Code : BT PPT 307A

| L | T | P | Credits |
|---|---|---|---|
| 3 | 1 | 0 | 4 |

| | |
|---|---|
| Class-work Marks | : 30 |
| Exam Marks | : 70 |
| Total Marks | : 100 |
| Duration of Examination | : 3 Hours |

**Course Objectives:**

- To study about basics of packaging.
- To study about different printing processes.
- To study about basic operation in printing and packaging.

### Unit-I

Introduction to Major Printing: Letterpress Printing-Introduction, Classification of letterpress printing machines, Advantages and dis-advantages, and applications. Flexography-Introduction, flexographic market and products, mechanical principles of flexography-Fountain roll, Anilox roll, cylinder and impression cylinder. Flexography press types –Stack press, central impression cylinder press and inline press.

### Unit-II

Gravure: Introduction, Different units of Gravure Printing Machin ,Pre-make ready & make ready steps and its application Screen printing- Digital printing process-Introduction and application. Advantages and dis-advantages.

### Unit-III

Basics of Packaging: Introduction, Classification of Packaging, Functions & roles of a packaging, Factors influencing design of a package. Types of Packaging - Flexible package, rigid package & semi-rigid package. Markings on package – Handling marks, routing marks, information marks.

### Unit-IV

Folding cartons – Production steps, types. Corrugated containers – classifications, components in a corrugated board, flutes & stages in preparation in corrugated boards. Plastic corrugated boards-features & advantages. Introduction to Innovative Packaging Techniques: Vacuum packaging, shrink packaging, stretch wrapping, blister packaging, skin packaging, and strip packaging.

**Reference Books:**


1. The Big Book of Packaging - Mr. Sandeep Kumar Goyal
2. The Eight Elements of Powerful Package Design Paperback – November 19, 2013 by Fumi Sasada (Author).
3. Printing Technology 5th edition, Publisher: Delmar, 2002
4. Art and Print Production - N.N. Sarkar.


**Course Outcomes:**

- Students know about basic elements of packaging.
- Students know about different printing processes.
- Students know about innovative packaging techniques.

**Note:**

- The paper setter will set a first compulsory question comprising of 6 to 10 sub parts (short questions), covering the entire syllabus and two questions (with/without parts) from each unit. The examinee will attempt five questions in all, along with the compulsory question (with all it sub parts), selecting one question from each unit. All questions will carry equal marks i.e. 14 marks each.
- The use of programmable devices such as programmable calculators etc. is not allowed during the exam. Sharing of materials will not be permitted during examination.

# Environment Studies (BT AUD308A)

Course Title : Environment Studies
Course Code : BT AUD 308A

| L | T | P | Credits |
|---|---|---|---|
| 3 | 0 | 0 | 0 |

Class-work Marks : 30
Exam Marks : 70
Total Marks : 100
Duration of Examination : 3 Hours

## Unit: I

The Multidisciplinary nature of environmental studies, Definition, scope and importance. Natural Resources: Renewable and non-renewable resources: Natural resources and associated problems.

a) Forest resources: Use and over-exploitation: deforestation, case studies, Timber exploitation, mining, dams and their effects and forests tribal people.

b) Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems.

c) Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies.

d) Food resources: World food problems, changes, caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies.

e) Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources; case studies.

f) Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification.

Role of an individual in conservation of natural resources. Equitable use of resources for sustainable lifestyles.

## Unit: II

Ecosystems: Concept of an ecosystem. Structure and function of an ecosystem.
Producers, consumers and decomposers. Energy flow in the ecosystem. Ecological succession. Food chains, food webs and ecological pyramids. Introduction, types, characteristic features, structure and function of the following eco-system:

a) Forest ecosystem.

b) Grassland ecosystem.

c) Desert ecosystem.

d) Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries).

## Unit: III

Biodiversity and its conservations:

Introduction – Definition: Genetic, species and ecosystem diversity.

Biogeographically classification of India. Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values. Biodiversity at global, National and local levels. India as a mega-diversity nation. Hot-spots of biodiversity. Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts. Endangered and endemic species of India.

## Unit: IV

Environmental Pollution: Definition, causes, effects and control, measures of: a) Air pollution

b) Water pollution
c) Soil pollution
d) Marine pollution
e) Noise pollution
f) Thermal Pollution
g) Nuclear hazards

Solid waste management: Causes effects and control measures of urban and industrial wastes. Role of an individual in prevention of pollution.

Pollution case studies. Disaster management: Floods, earthquake, cyclone and landslides.

Social issues and the Environment:

a) From unsustainable to sustainable development
b) Urban problems related to energy
c) Water conservation, rain water harvesting, watershed management
d) Resettlement and rehabilitation of people; its problems and concerns, case studies
e) Environmental ethics: Issues and possible solutions
f) Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust, Case studies g) Wasteland reclamation
h) Consumerism and waste products

**Text Books:**


1. Bharucha, Franch, The Biodiversity of India, Mapin Publishing Pvt. Ltd., Ahmedabad – 380013, India.
2. Brunner R.C. 1989, Hazardous Waste Incineration, Mc. Graw Hill Inc. 480pp.
3. Clark R.S., Marine Pllution, Slanderson Press Oxford (TB).
4. Cunningham, W.P. Cooper, T.H. Gorhani, E & Hepworth, M.T. 2001, Environmental
5. Encyclopedia, Jaico Pub. House, Mumbai. 1195p.
6. De A.K., Environmenal Chemistry, Wiley Eastern Ltd. Down to Earth, Centre for Science and Environment ®.

**Reference Books:**


1. Gleick, H.P., 1993. Water in Crisis, Pacific Institute for Studies in Dev., Environment & Security, Stockholm Env. Institute, Oxford Univ., Press 473p.
2. Hawkins R.E. Encyclopedia of Indian Natural History. Bomaby Natural History Scociety, Bombay (R).
3. Heywood, V.H. & Watson, R.T. 1995. Global Biodiversity Assessment. Cambridge Univ. Press, 1140p.
4. Jadhav, H & Bhosale, V.M. 1995. Environmental Protection and Laws, Himalaya Pub. House, 7. Helhi 284p.
5. McKinney, M.L. & Schoch, RM 1996. Environmental Sciences Systems & Solutions, Web enhanced Edition 639p


**Note:**

- The paper setter will set a first compulsory question comprising of 6 to 10 sub parts (short questions), covering the entire syllabus and two questions (with/without parts) from each unit. The examinee will attempt five questions in all, along with the compulsory question (with all it sub parts), selecting one question from each unit. All questions will carry equal marks i.e. 14 marks each.
- The use of programmable devices such as programmable calculators etc. is not allowed during the exam. Sharing of materials will not be permitted during examination.

## Offset Technology (BT PPT 401A)

Course Title : Offset Technology
Course Code : BT PPT 401A

| L | T | P | Credits |
|---|---|---|---|
| 3 | 1 | 0 | 4 |

Class-work Marks : 30
Exam Marks : 70
Total Marks : 100
Duration of Examination : 3 Hours

**Course Objectives:**

- To study about the history of lithography.
- To study about different developments in lithography.
- To study about different section of lithography machine.

**Unit: I**

History of lithography. Print media and Classification of Printing Organizations. Recent trends in offset press technology. Basic principles of sheet fed offset printing. Construction and categories of sheet fed offset press. Safe handling of tools, equipment and materials in offset press.

**Unit: II**

Feeding unit: Functions of the feeding section, sheet feeding types, feeding cycle, components of feeder, sheet conveying mechanisms, sheet detectors, sheet register, front lay and side lay, sheet insertion systems, grippers. Inking unit: role and function of inking system, different parts of inking system, split duct techniques, types of rollers in the inking system, setting of the rollers, care and maintenance of rollers, different inking systems, shore durometer.

**Unit: III**

Dampening system: role and function of the dampening system, fountain solution, pH and conductivity of the fountain solutions, role of water in fountain solution, role of alcohol or alcohol substitutes in fountain solution, different rollers in the dampening system, roller coverings, doctor dwell, desensitizing the metal rollers, different dampening systems, cure and maintenance of the dampening system. Printing unit: different cylinders and their construction, cylinder gears, cylinder gap, bearers, undercut, cylinder packing, patching, printing pressures, cylinder setting theories, cylinder balancing. Pre-make ready and make ready. Progressive print out.

**Unit: IV**

Delivery section: role and function of delivery section, transfer cylinder, sheet transfer, sheet delivery, short and extended delivery systems, sheet control devices, anti-setoff spray powder unit. Machine production. Trouble shooting. Printing machine maintenance. Recent Advancement in quality control in sheet fed offset ISO: 12647.

**Reference Books:**


1. Sheet Fed Offset Technology- Dr. Anjan Kumar Baral
2. John MacPhee, "Fundamentals of Lithographic Printing", Vol.1 Mechanics of Printing, GATF Press, 2002.
3. A.S.Porter, "A Manual of Lithographic Press Operation", Lithographic Training Services, London, 1998.
4. Helmut Kippan, "Handbook of Print media", Springer publications, 2004.


**Course Outcomes:**

- Students know about the invention of offset printing process.
- Students know about the different parts of offset printing machine.
- Students know about recent advancements in offset printing process.

**Note:**

- The paper setter will set a first compulsory question comprising of 6 to 10 sub parts (short questions), covering the entire syllabus and two questions (with/without parts) from each unit. The examinee will attempt five questions in all, along with the compulsory question (with all it sub parts), selecting one question from each unit. All questions will carry equal marks i.e. 14 marks each.
- The use of programmable devices such as programmable calculators etc. is not allowed during the exam. Sharing of materials will not be permitted during examination.

## Offset Technology Lab (BT PPT 402A)

Course Title : Offset Technology Lab
Course Code : BT PPT 402A

| L | T | P | Credits |
|---|---|---|---|
| 0 | 0 | 2 | 1 |

Class-work Marks : 30
Exam Marks : 70
Total Marks : 100
Duration of Examination : 3 Hours

**List of Experiments:**

1. Study of various controls and operations.
2. Setting the feeder, feed board, lays.
3. Setting the delivery system.
4. Setting the water and ink rollers.
5. Fixing the plate.
6. Study of make-ready operations.
7. Single color printing.
8. Two color printing.

## Packaging Process-I (BT PPT403A)

Course Title : Packaging Process-I
Course Code : BT PPT403A

| L | T | P | Credits |
|---|---|---|---|
| 3 | 1 | 0 | 4 |

Class-work Marks : 30
Exam Marks : 70
Total Marks : 100
Duration of Examination : 3 Hours

**Course Objectives:**

- To study about the need and function of packaging.
- To study about packaging processes.
- To study about specialty packaging.

### Unit-I

Introduction: Need for packaging, functions of packaging-types and selection of package, packaging hazards, interaction of package and shelf life-estimation, Packaging materials-selection criteria, Materials and machine interface, life cycle assessment.

### Unit-II

Package Design: Package design, Package specification types of design, structural, graphics, Factors influencing design, fundamentals of graphic layout design, Package colour- Selection criteria- applications, Types of load, unit load - safe stacking load, elements and principles of design, Structural design – cans, bottles, folding cartons, corrugated boxes.

### Unit-III

Manufacturing Process: carton manufacturing –Cutting; creasing; die making-punching. Machineries-types, flexible pouches forming machines, corrugated box manufacturing process, Rigid boxes manufacturing process, Collapsible tubes, Flexible pouches forming machines; Metal foil packaging.

### Unit-IV

Speciality Packaging :Aerosol packaging, blister packaging, anti-static packaging, Aseptic packaging, Child resistant packages - closures, Modified Atmospheric Packaging (MAP), Vacuum Packaging, Retort packaging, Food packaging - Advancement and developments in packaging; RFID in packaging, Eco-friendly packaging, Export packaging, Labels – Types, functions; Closures-application and types; Cushion Packaging – Need, types, Design Requirements.

**Reference Books:**


1. Walter Soroka, Fundamentals of Packaging Technology, Institute of packaging professionals.
2. Bill Stewart, "Packaging Design Strategies", Pira International.
3. Aaron L.Brody & Kenneth S.Marsh, "Encyclopedia of Packaging Technology",
4. Walter Stern, "Handbook of Package Design Research", Wiley Interscience.
5. Paine, "Packaging Development", PIRA International, 1990.
6. Arthur Hirsch, "Flexible Food Packaging", Van Nostor and Reinhold, New York.
7. Susan E.M.Selke & et al, Plastics Packaging, Hansar.
8. S. Natarajan, M. Govindarajan,and B Kumar "Fundamental of Packaging Technology" PHI.


**Course Outcomes:**

- Students know about the function of packaging and package design.
- Students know about various package manufacturing process.
- Students know about application of specialty packaging.

**Note:**

- The paper setter will set a first compulsory question comprising of 6 to 10 sub parts (short questions), covering the entire syllabus and two questions (with/without parts) from each unit. The examinee will attempt five questions in all, along with the compulsory question (with all it sub parts), selecting one question from each unit. All questions will carry equal marks i.e. 14 marks each.
- The use of programmable devices such as programmable calculators etc. is not allowed during the exam. Sharing of materials will not be permitted during examination.

## Packaging Process –I Lab (BT PPT 404A)

Course Title : Packaging Process –I Lab
Course Code : BT PPT 404A

| L | T | P | Credits |
|---|---|---|---|
| 0 | 0 | 2 | 1 |

Class-work Marks : 30
Exam Marks : 70
Total Marks : 100
Duration of Examination : 3 Hours

**List of Experiments:**

1. Measurement of Thickness of Paper and board.
2. Measurement of Compression Strength of Paper and board.
3. Measurement of Stiffness of Paper and board.
4. Measurement of Moisture content of Paper and board.
5. Measurement of Folding Endurance of Paper and board.
6. Measurement of Cobb value of Paper and board.
7. Measurement of bursting strength of Paper and board.
8. Drop Test.

## Essentials of Management (BT PPT 405A)

Course Title : Essentials of Management
Course Code : BT PPT 405A

| L | T | P | Credits |
|---|---|---|---|
| 3 | 0 | 0 | 3 |

Class-work Marks : 30
Exam Marks : 70
Total Marks : 100
Duration of Examination : 3 Hours

**Objectives:**
To understand the principles of management and their application to the functioning of an Organization.

### Unit: I

Introduction To Management And Organizations: Definition of management, science or art, manager vs entrepreneur; Types of managers- managerial roles and skills; Evolution of management- scientific, human relations, system and contingency approaches; Types of Business Organizations, sole proprietorship, partnership, company, public and private enterprises; Organization culture and environment;
Current trends and issues in management.

### Unit: II

Planning & Organizing: Nature and purpose of Planning, Planning process, types of Planning, Objectives, Policies, Strategic Management Planning Tools and Techniques, Decision making steps & processes.
Nature and purpose of Organizing, formal and informal organization, organization structure types- line and staff authority, departmentalization, delegation of authority, centralization and decentralization,

### Unit: III

HRM & Directing: Job design, human resource management, HR planning, Recruitment & selection, Training & Development, Performance Management, Career planning and Management. Directing, Foundations of individual and group behavior, motivation theories, motivational techniques, job satisfaction, job enrichment, leadership, leadership- types & theories, communication – process of communication – barrier in communication – effective communication – communication and IT.

### Unit: IV

Controlling: Controlling, system and process of controlling, budgetary and non-budgetary control techniques, use of computers and IT in management control, productivity problems and management, control and performance, direct and preventive control, reporting.

**Reference Books:**


1. Robins S.P. and Couiter M., Management, Prentice Hall India, 10th ed., 2009.
2. Stoner JAF, Freeman RE and Gilbert DR, Management, 6th ed., Pearson Education, 2004.
3. Tripathy PC & Reddy PN, Principles of Management, Tata McGraw Hill, 1999.


**Course Outcomes:**

- Upon completion of this course, the students will get a clear understanding of management
- Functions in an organization

**Note:**

- The paper setter will set a first compulsory question comprising of 6 to 10 sub parts (short questions), covering the entire syllabus and two questions (with/without parts) from each unit. The examinee will attempt five questions in all, along with the compulsory question (with all it sub parts), selecting one question from each unit. All questions will carry equal marks i.e. 14 marks each.
- The use of programmable devices such as programmable calculators etc. is not allowed during the exam. Sharing of materials will not be permitted during examination.

## Printing & Packaging Materials Science-II (BT PPT 406A)

Course Title : Printing & Packaging Materials Science-II
Course Code : BT PPT 406A

| L | T | P | Credits |
|---|---|---|---|
| 3 | 1 | 0 | 4 |

| | |
|---|---|
| Class-work Marks | : 30 |
| Exam Marks | : 70 |
| Total Marks | : 100 |
| Duration of Examination | : 3 Hours |

**Course Objectives:**

- To study about the bio-degradable materials.
- To study about printing and packaging ink.
- To study about adhesive and organic compound.

### Unit: I

Printing Ink: Constituents of printing inks, general characteristics and requirement of printing ink for various printing processes, rheology, concept in ink manufacturing. Basic drying methods and their suitability for printing processes. Three and four colour process ink for different printing process. Special ink- heat set quick set, fugitive metallic, gloss, moisture set magnetic ink for UV and infrared, florescent and their suitability to different applications, improvements of various properties, testing and measurement of properties.

### Unit: II

Acid, alkalis and pH: Definition of pH, pH scales and testing of pH, concentration and pH value, Buffer solution. Significance of pH control in various paper and printing. Measurement of pH using indicator, comparator and meter. Principle and concentration of digital pH meter.

### Unit: III

Eco-friendly Material and Pollution Control: Bio-degradable materials, toxic materials, recycling waste treatment and cleaning agent.

### Unit: IV

Adhesive, coating and organic compound: physical and chemical factors classifications. Introduction to carbon compound, diazo compounds, aromatic compounds, organic coating and varnish.

**Reference Books:**


1. Printing Science - L C Young.
2. Printing Materials - Bob Thompson.
3. Printing Material - Prakash Shetty
4. Material for printing process by Focal Publishers.
5. Advance Science for Learning.


**Course Outcomes:**

- Students know about bio-degradable materials used in printing and packaging.
- Students know about constituents of printing and packaging inks.
- Students know about adhesive and organic compound and its applications.

**Note:**

- The paper setter will set a first compulsory question comprising of 6 to 10 sub parts (short questions), covering the entire syllabus and two questions (with/without parts) from each unit. The examinee will attempt five questions in all, along with the compulsory question (with all it sub parts), selecting one question from each unit. All questions will carry equal marks i.e. 14 marks each.
- The use of programmable devices such as programmable calculators etc. is not allowed during the exam. Sharing of materials will not be permitted during examination.

## Costing, Estimating and ERP (BT PPT 407A)

Course Title : Costing, Estimating and ERP
Course Code : BT PPT 407A

| L | T | P | Credits |
|---|---|---|---|
| 3 | 0 | 0 | 3 |

Class-work Marks : 30
Exam Marks : 70
Total Marks : 100
Duration of Examination : 3 Hours

**Course Objective**

- To study about costing system.
- To study about calculation of paper and board wastage formulas.
- To study about costing of ink and thread.

**Unit: I**

Brief introduction to India and Federation Costing system. Importance of costing and estimating in printing and publishing trade, definition of cost, price and profit.

**Unit: II**

Estimating and it's inter relationship with purchasing sales and management. Importance of accurate estimating, Requirements, Qualifications and tools of an estimator. Estimating errors and their rectification, estimating on the basis of price lists, reprint work, change back system, standard catalogues, etc. Calculation of paper, board, ink covering and other finishing materials, wastage formulas. Estimating for the warehouse operations. Estimating for letter assembly, camera work, processing and planning, various methods of image carrier preparation, and machine hours for various processes of printing. Operational times and current market rates.

**Unit: III**

Definition, purposes and functions, aims and objects of costing, elements of cost, principles of scientific costing system. Foundations of costing system, classes of department, allocation and apportionment of expenses, basis of apportionments. Direct and indirect cost, hourly rates, recovery of elements of cost distribution of expenses. Calculation of machine hour rates. Fixed cost and variable cost, total cost and unit cost, break-even analysis- determination and graphical representation. Principles, stages, forms and specimens, costing routine.

**Unit: IV**

Making of estimates of complete jobs from designing to binding and finishing, original and reprint jobs, estimation and consideration for filler works, repeat works, outsource works, rush works, for new customers and contact works. Definition ERP, various factions and application in printing and packaging industry.

**References Books:**


1. Printer's Costing & Estimating - B. D. Mendiratta
2. Costing for the smaller Printing Business, BPIF, and London.
3. Estimating for the Printing Business, BPIF, and London. Published by Orion Publishing Group, London.
4. Printing Estimating Principles and practice by Philip Kent Rugged, California Polytechnic State University.


**Course outcomes:**

- Students know about costing system.
- Calculation of paper and board wastage formulas.
- Students know about costing of ink and thread.

Note:

- The paper setter will set a first compulsory question comprising of 6 to 10 sub parts (short questions), covering the entire syllabus and two questions (with/without parts) from each unit. The examinee will attempt five questions in all, along with the compulsory question (with all it sub parts), selecting one question from each unit. All questions will carry equal marks i.e. 14 marks each.
- The use of programmable devices such as programmable calculators etc. is not allowed during the exam. Sharing of materials will not be permitted during examination.

## Printing & Packaging Materials Testing Lab (BT PPT 408A)

Course Title : Printing & Packaging Materials Testing Lab
Course Code : BT PPT 408A

| L | T | P | Credits |
|---|---|---|---|
| 0 | 0 | 2 | 1 |

Class-work Marks : 30
Exam Marks : 70
Total Marks : 100
Duration of Examination : 3 Hours

**List of Experiments:**

1 .Measurement of GSM of paper and paperboard.
2 .Measurement of moisture of paper and paperboard.
3 .Measurement of Tearing Strength of paper and paperboard.
4. Measurement of Surface Oil Absorption Test (SOAT).
5. Measurement of Gloss and Brightness of paper and paperboard.
6. Measurement of Opacity of paper and paperboard.
7 .Measurement of Water absorbency of paper and paperboard.
8. Measurement of RH.

## Printing and Packaging Materials (BT PPT 409A)

Course Title : Printing and Packaging Materials
Course Code : BT PPT 409A

| L | T | P | Credits |
|---|---|---|---|
| 3 | 1 | 0 | 4 |

| | |
|---|---|
| Class-work Marks | : 30 |
| Exam Marks | : 70 |
| Total Marks | : 100 |
| Duration of Examination | : 3 Hours |

**Course Objectives:**

- To study about polymer materials.
- To study about printing and packaging Ink.
- To study about photographic materials, adhesive and paper substrate.

### Unit: I

Fundamentals of Polymers, Classification of Polymers, Types of Polymers—Plastic, Thermoplastic, Thermosetting plastic, Rubber-natural, Synthetic rubber, Fibers, Physical, Chemical and Mechanical properties and characteristics of polymer, Metallized films.

### Unit: II

Paper: Introduction, nature of paper, types of paper, Properties-physical, strength and printing properties. Adhesive-Introduction, types of adhesive and application in printing and packaging technology.

### Unit: III

Photographic Materials & Aluminum foil: Introduction, base material, photographic emulsions and Light sensitive materials. AL foil-Aluminum foil, properties, application & uses in packaging.

### Unit: IV

Printing and Packaging Inks and Fountain Solution: Introduction, Types of Printing Inks, Ingredients in Printing Inks-Vehicle, Pigments and Additives. Properties of Inks- Drying, Rheology and end-use properties. Fountain Solution-Introduction, Composition and functions.

**Reference Books:**


1. Printing Science - L C Young.
2. Printing Materials - Bob Thompson
3. Printing Material - Prakash Shetty


**Course outcomes:**

- Students know about different polymers.
- Students know about component of ink and properties.

**Note:**

- The paper setter will set a first compulsory question comprising of 6 to 10 sub parts (short questions), covering the entire syllabus and two questions (with/without parts) from each unit. The examinee will attempt five questions in all, along with the compulsory question (with all it sub parts), selecting one question from each unit. All questions will carry equal marks i.e. 14 marks each.
- The use of programmable devices such as programmable calculators etc. is not allowed during the exam. Sharing of materials will not be permitted during examination.

## Indian Constitution (BT AUD 410A)

Course Title : Indian Constitution
Course Code : BT AUD 410A

| L | T | P | Credits |
|---|---|---|---|
| 3 | 1 | 0 | 4 |

Class-work Marks : 30
Exam Marks : 70
Total Marks : 100
Duration of Examination : 3 Hours

**CONSTITUTION OF INDIA– BASIC FEATURES AND FUNDAMENTAL PRINCIPLES**

The Constitution of India is the supreme law of India. Parliament of India cannot make any law which violates the Fundamental Rights enumerated under the Part III of the Constitution. The Parliament of India has been empowered to amend the Constitution under Article 368, however, it cannot use this power to change the "basic structure" of the constitution, which has been ruled and explained by the Supreme Court of India in its historical judgments. The Constitution of India reflects the idea of "Constitutionalism" – a modern and progressive concept historically developed by the thinkers of "liberalism" – an ideology which has been recognized as one of the most popular political ideology and result of historical struggles against arbitrary use of sovereign power by state. The historic revolutions in France, England, America and particularly European Renaissance and Reformation movement have resulted into progressive legal reforms in the form of "constitutionalism" in many countries. The Constitution of India was made by borrowing models and principles from many countries including United Kingdom and America.

The Constitution of India is not only a legal document but it also reflects social, political and economic perspectives of the Indian Society. It reflects India's legacy of "diversity". It has been said that Indian constitution reflects ideals of its freedom movement, however, few critics have argued that it does not truly incorporate our own ancient legal heritage and cultural values. No law can be "static" and therefore the Constitution of India has also been amended more than one hundred times. These amendments reflect political, social and economic developments since the year 1950.

The Indian judiciary and particularly the Supreme Court of India has played an historic role as the guardian of people. It has been protecting not only basic ideals of the Constitution but also strengthened the same through progressive interpretations of the text of the Constitution. The judicial activism of the Supreme Court of India and its historic contributions has been recognized throughout the world and it gradually made it "as one of the strongest court in the world".

**Unit: 1**

1. Meaning of the constitution law and constitutionalism.
2. Historical perspective of the Constitution of India.
3. Salient features and characteristics of the Constitution of India.
4. Scheme of the fundamental rights.

**Unit: 2**

1. The scheme of the Fundamental Duties and its legal status.
2. The Directive Principles of State Policy – Its importance and implementation.
3. Federal structure and distribution of legislative and financial powers between the Union and the States.

**Unit: 3**

1. Parliamentary Form of Government in India – The constitution powers and status of the President of India
2. Amendment of the Constitutional Powers and Procedure
3. The historical perspectives of the constitutional amendments in India
4. Emergency Provisions: National Emergency, President Rule, Financial Emergency

**Unit: 4**

1. Local Self Government – Constitutional Scheme in India
2. Scheme of the Fundamental Right to Equality
3. Scheme of the Fundamental Right to certain Freedom under Article 19
4. Scope of the Right to Life and Personal Liberty under Article 21

**Reference Books:**


1. The Constitutional Law of India 9th Edition, by Pandey. J. N.
2. The Constitution of India by P.M.Bakshi
3. Constitution Law of India by Narender Kumar
4. Bare Act by P. M. Bakshi.


**Note:**

- The paper setter will set a first compulsory question comprising of 6 to 10 sub parts (short questions), covering the entire syllabus and two questions (with/without parts) from each unit. The examinee will attempt five questions in all, along with the compulsory question (with all it sub parts), selecting one question from each unit. All questions will carry equal marks i.e. 14 marks each.
- The use of programmable devices such as programmable calculators etc. is not allowed during the exam. Sharing of materials will not be permitted during examination.

DEPT. OF COMPUTER SCIENCE & ENGINEERING
CENTRAL UNIVERSITY OF HARYANA, MAHENDERGARH

# Proceedings / Minutes of the Meeting of 2nd Board of Studies in Computer Science &Engg. Held on 15.02.2019

The meeting of the Board of Studies in Computer Science &Engg. was held on 15.02.2019. The following were present

1. Dr. Ajay Kumar Bansal, HOD, CSE- Chairperson
2. Dr. Nasib Singh Gill, Subject Expert- Member
3. Dr Phool Singh, Associate Professor- Member
4. Ms Eakta Kumari, Assistant Professor- Member
5. Ms. Sangeeta, Assistant Professor- Special Invitee
6. Mr. Nalin Chaudhary, Assistant Professor- Special Invitee

After detailed deliberations, the board recommends as under:

1. Confirmation of minutes of last BOS meeting held on 10.10.2018.
2. The scheme of study & examination and Syllabi for B.Tech CSE 3rd and 4th semester for 2018 batch onwards(to be implemented from session 2019-20 onwards) was finalized and recommended for necessary approvals.(Annexure-1 &2)
3. The Panels of question paper setters & practical examiners for B.Tech. Computer Science & Engineering for the forthcoming examinations were prepared and recommended. (Annexure-3,4 & 5)
4. The committee also resolved to recommended SWAYAM/MOOC courses to be opted by the students of B.Tech Computer Science & Engineering under the GEC out of the list of courses identified.(Annexure-6)

The meeting ended with vote of thanks to the Chair.

Mr. Nalin Chaudhary

Ms. Sangeeta

Ms Eakta Kumari

Dr Phool Singh 1/2/19

Dr. Nasib Singh Gill 15/2/2019

Dr. Ajay Kumar Bansal 15/2/19

# Scheme & Syllabus for B.Tech (Computer Science & Engineering) (II$^{nd}$ Year) according to Choice Based Credit System (CBCS)

## (Semester III$^{rd}$ and Semester IV$^{th}$)

## For Session 2019-20 onwards
## (Batch 2018-2019 onwards)



## Department of Computer Science & Engineering
## School of Engineering & Technology

## CENTRAL UNIVERSITY OF HARYANA
## MAHENDERGARH-123031
## HARYANA

## Scheme –B. Tech. (CSE 2nd Year)
### THIRD SEMESTER

| CODE | SUBJECT | L | T | P | CREDIT | Theory | Practical | Internal Assessment | Total Marks |
|---|---|---|---|---|---|---|---|---|---|
| BT CS 301 | Data Structures and Algorithms | 3 | 1 | - | 4 | 70 | - | 30 | 100 |
| BT MT 301 | Mathematics-III | 3 | 1 | - | 4 | 70 | - | 30 | 100 |
| BT CS 302 | Digital Electronics | 3 | - | - | 3 | 70 | - | 30 | 100 |
| | GEC-I* | 3 | 1 | - | 4 | 70 | - | 30 | 100 |
| BT HUM 304 | Fundamentals of Management | 3 | - | - | 3 | 70 | - | 30 | 100 |
| BT CS 303 | Computer Organization & Architecture | 3 | 1 | - | 4 | 70 | - | 30 | 100 |
| BT CS 304 | Data Structures & Algorithms Lab | - | - | 2 | 1.0 | - | 35 | 15 | 50 |
| BT CS 305 | Digital Electronics Lab | - | - | 2 | 1.0 | - | 35 | 15 | 50 |
| | Total | 18 | 4 | 4 | 24 | 420 | 70 | 210 | 700 |

*GEC to be taken from other department

**List of GEC for other department**

| CODE | GEC SUBJECTS |
|---|---|
| BT CS 301 | Data Structure & Algorithms |
| BT CS 303 | Computer Organization & Architecture |

15/12/2015

## FOURTH SEMESTER

| CODE | SUBJECT | L | T | P | CREDIT | Theory | Practical | Internal Assessment | Total Marks |
|---|---|---|---|---|---|---|---|---|---|
| BT CS 401 | Database Management System (DBMS) | 3 | 1 | - | 4 | 70 | - | 30 | 100 |
| BT CS 402 | Object Oriented Programming using C++ (OOPS) | 3 | 1 | - | 4 | 70 | - | 30 | 100 |
| BT ECO 507A | Economics | 3 | - | - | 3 | 70 | - | 30 | 100 |
| BT AUD 308A | Environmental Sciences | 3 | - | - | - | 70 | - | 30 | 100 |
| BT CS 403 | Discrete Structures | 3 | - | - | 3 | 70 | - | 30 | 100 |
| | GEC-II* | 3 | 1 | - | 4 | 70 | - | 30 | 100 |
| BT CS 404 | DBMS Lab | - | - | 2 | 1.0 | - | 35 | 15 | 50 |
| BT CS 405 | C++ Programming LAB | - | - | 2 | 1.0 | - | 35 | 15 | 50 |
| | Total | 18 | 3 | 4 | **20** | 420 | 70 | 210 | 700 |

*GEC to be taken from other department

**List of GEC for other department**

| CODE | GEC SUBJECTS |
|---|---|
| BT CS 402 | Object Oriented Programming using C++ (OOPS) |

## Third Semester
## Data Structures & Algorithms

**BT CS 301**

L - T - P
3 - 1 - 0

**UNIT-1**

**Data structures and Algorithms: an overview**: concept of data structure, choice of right data structures, types of data structures, basic terminology Algorithms, how to design and develop an algorithm: stepwise refinement, use of accumulators and counters; algorithm analysis, complexity of algorithms Big-oh notation.

**Arrays: Searching Sorting**: Introduction, One Dimensional Arrays, **Operations Defined**: traversal, selection, searching, insertion, deletion, and sorting. Multidimensional arrays, address calculation of a location in arrays.

**Searching:** Linear search, Recursive and Non recursive binary Search.

**Sorting:** Selection sort, Bubble sort, Insertion sort, Merge sort, Quick sort, Shell sort, Heap sort

**UNIT-2**

**Stacks and queues**: Stacks, array representation of stack, Applications of stacks. Queues, Circular queues, array representation of Queues, Deque, priority queues, Applications of Queues.

**Pointers**: Pointer variables, Pointer and arrays, array of pointers, pointers and structures, Dynamic allocation.

**Linked Lists**: Concept of a linked list,. Circular linked list, doubly linked list, operations on linked lists. Concepts of header linked lists. Applications of linked lists, linked stacks, linked Queues.

**UNIT-3**

**Trees**: Introduction to trees, binary trees, representation and traversal of trees, operations on binary trees, types of binary trees, threaded binary trees, B Trees, Application of trees.

**Graphs**: Introduction, terminology, 'set, linked and matrix' representation, Graph traversal techniques: BFS, DFS, operations on graphs, Minimum spanning trees, Applications of graphs

**UNIT-4**

Introduction to file handling, Data and Information, File concepts, File organization, files and streams, working with files. AVL trees, Sets, list representation of sets, applications of sets.

**Text Books:**


1 A.M. Tenenbaum, Langsam, Moshe J. Augentem , "Data Structures using C", Pearson
2 Reema Thareja ,"Data Structures using C", OUP India Pub.


**Reference Books:**


1 A.V. Aho, J.E. Hopcroft and T.D. Ullman,"Data Structures and Algorithms", Original edition, Addison-Wesley.
2 Ellis Horowitz & Sartaj Sahni,"Fundamentals of Data Structure", OBS Pub.
3 Introduction to Computers Science -An algorithms approach, Jean Paul Tremblay, Richard B. Bunt, T.M.H.
4 Lipschutz Seymour ,"Data Structures with C (Schaum's Outline Series)", Megraw Hill

## Mathematics-III

**BT MT 301**

**L-T-P**
**3- 1- 0**

**UNIT-1**

Multivariable Calculus (Differentiation): Limit, continuity and differentiability of functions of two or more variables. Partial differentiation, Euler's theorem on homogeneous functions, change of variables, chain rule, Taylor's theorem (two variables), approximate calculations, Jacobian, maxima and minima of two independent variables, Lagrange's method of multipliers.

**UNIT-2**

Ordinary differential Equations of first order and first degree: Exact, Reducible to Exact, linear and Bernoulli's equations. Linear differential Equations of higher order with constant coefficients, Cauchy – Euler Differential Equation, Legendre Linear Equation, Method of variation of parameters, Method of undetermined coefficient. Application of ordinary differential equations.

**UNIT-3**

Laplace Transform: Definition and existence of Laplace transform, Properties of Laplace Transform and formulae, Unit Step function, Dirac Delta function, Heaviside function, Laplace transform of periodic functions. Finding inverse Laplace transform by different methods, convolution theorem. Evaluation of integrals by Laplace transform, solving ODEs by Laplace transforms method.

**UNIT-4**

Fourier Series: Periodic functions, Fourier series, Euler's formula, Change of intervals, Half range sine and cosine series.

Fourier Transform: Fourier Complex, Sine and Cosine transform, properties and formulae, inverse Fourier transforms, Convolution theorem.

**Text Books:**

[1] E. Kreyszig, *Advanced Engineering Mathematics*, 10 edition. Hoboken, NJ: Wiley.
[2] B. Ramana, *Higher Engineering Mathematics*, 1st edition. New Delhi: McGraw Hill Education.
[3] B. S. Grewal, *Higher Engineering Mathematics 44th Edition*. Khanna Publishers.
[4] R. K. Jain and S. R. K. Iyengar, *Advanced Engineering Mathematics 4/e )*, Fourth edition edition. Oxford: Narosa Publishing House Pvt. Ltd. - New Delhi.

**Reference Books:**

[1] J. R. Hass, C. E. Heil, and M. D. Weir, *Thomas' Calculus*, 14 edition. Boston? Pearson.
[2] P. S. Das and C. Vijayakumari, *Engineering Mathematics*, First edition. Place of publication not identified: Pearson Education.
[3] J. Bird, *Higher Engineering Mathematics, 7th ed.*, 7 edition. Abingdon, Oxon ; New York, NY: Routledge.
[4] T. Veerarajan, *Engineering Mathematics*. McGraw Hill Education India Pvt Ltd.

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## Digital Electronics

**BT CS 302**

L- T- P
3 - 0 - 0

**UNIT - 1**

**Binary Systems:** Digital Systems, Binary Numbers, Number base conversions, Octal and Hexadecimal Numbers, complements, Signed binary numbers, Binary codes, Binary Storage and Registers, Binary logic.

**Boolean Algebra And Logic Gates:** Basic Definitions, Axiomatic definition of Boolean Algebra, Basic theorems and properties of Boolean algebra, Boolean functions canonical and standard forms, other logic operations, Digital logic gages, integrated circuits.

**UNIT -2**

**Gate – Level Minimization:** The map method, Four-variable map, Five-Variable map, product of sums simplification Don't-care conditions, NAND and NOR implementation other Two-level implementations, Exclusive – Or function, Hardware Description language (HDL).

**Combinational Logic:** Combinational Circuits, Analysis procedure Design procedure, Binary Adder-Subtractor, Decimal Adder, Binary multiplier, magnitude comparator, Decoders, Encoders, Multiplexers, HDL for combinational circuits.

**UNIT -3**

**Synchronous Sequential Logic:** Sequential circuits, latches, Flip-Flops Analysis of clocked sequential circuits, HDL for sequential circuits, State Reduction and Assignment, Design Procedure.

**Registers and Counters:** Registers, shift Registers, Ripple counters synchronous counters, other counters, HDL for Registers and counters.

**UNIT -4**

**Memory, CPLDs, and FPGAs:** -Introduction, Random-Access Memory, Memory Decoding, Error Detection and correction Read-only memory, Programmable logic Array programmable Array logic, Sequential Programmable Devices.

**Asynchronous Sequential Logic:** Introduction, Analysis Procedure, Circuits with Latches, Design Procedure, Reduction of state and Flow Tables, Race-Free state Assignment Hazards, Design Example.

**Text Books :**


1. JAIN, *MODERN DIGITAL ELECTRONICS 4E*, Tata McGraw-Hill Education.
2. Mano and Ciletti, *Digital Design*, Pearson Education India.
3. Gill Nasib Singh and Dixit J.B., Digital Design and Computer Organisation, University Science Press (An Imprint of Laxmi Publications Pvt. Ltd.), New Delhi.
4. M. M. Morris, *Computer System Architecture 3e (Update) by Pearson*, Third edition, Pearson Education.


**Reference Books :**


1. H. Taub and D. L. Schilling, *Digital Integrated Electronics*, McGraw-Hill.
2. A. P. Malvino and D. P. Leach, *Digital principles and applications*, McGraw-Hill.
3. W. Stallings, *Computer Organization and Architecture: Designing for Performance (ninth Edition)*.
4. D. A. Patterson and J. L. Hennessy, *Computer Organization and Design: The Hardware-software Interface*, Morgan Kaufmann.

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## Fundamentals of Management

BT HUM 304

L-T-P
3-0-0

**Unit-1**
Meaning of management, Definitions of Management, Characteristics of management, Importance of Management; Management as Art, Science and Profession; Development of Management thoughts- – Fayol's principles of Management, Taylors Scientific Management, Elton Mayo's Human Relations School, System's Approach to Management; Principles of Management, Management Processes- Planning, Organizing, Staffing, Leading and Controlling; Delegation and Decentralization.

**Unit-2**
Production Management : Definition, Objectives, Functions and Scope, Production Planning and Control; its significance, stages in production planning and control. Brief introduction to the concepts of material management, inventory control; its importance and various methods.

**Unit-3**
Marketing Management - Definition of marketing, Marketing concept, objectives & Functions of marketing, Marketing Research - Meaning: Definition; objectives; Importance; Limitations; Process. Advertising - meaning of advertising, objectives, functions, criticism.

**Unit-4**
An Introduction of Financial Management, Objectives of Financial Management, Functions and Importance of Financial Management, Role of Financial Manager. Brief Introduction to the concept of capital structure and various sources of finance

**Text Books:**


1. Robins S.P. and Coulter M., Management, Prentice Hall India, 10th ed.
2. Stoner JAF, Freeman RE and Gilbert DR, Management, 6th ed., Pearson Education.
3. Tripathy PC & Reddy PN, Principles of Management, Tata McGraw Hill.


**Reference Books:**


1. Pandey I. P., Financial Management (11th ed.). New Delhi: Vikas Publishing House.
2. Kotler, P., Keller K. L. Marketing Management (5th ed.). Pearson.
3. Robbins, S. P., DeCenzo, D., Agarwal, M. N., & Bhattacharyya, S. Essentials of Management (6 ed.). New Delhi: Pearson Edcuation.

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## Computer Organization & Architecture

**BT CS 303**

L-T-P
3 -1 -0

**UNIT-1**

**Introduction:** Historical overview, economic trends, underlying technologies, Data Representation-Data Types, Complements, Fixed-Point Representation, Floating-Point Representation, Error Detection and Correction, Addition, Subtraction, Multiplication and Division algorithms and hardware.

**Register Transfer and Micro operations:** Register transfer language, Inter-Register Transfer, Arithmetic Micro-operations, Logic and Shift micro-operations Language, Control functions.

**UNIT-2**

**Arithmetic Logic Unit:** Arithmetic, logic and shift micro operations, Constructing an arithmetic logic shift unit

**Basic Computer Architecture and Design:** Computer registers, Computer Instructions-Instruction Set Completeness, Classifying Instruction Set Architecture, Basic steps of Instruction Execution, Hardwired Control, Micro programmed Control, Horizontal and Vertical Microprogramming, Interrupts.

**Central Processing Unit:** General Register Organization, Stack Organized CPU, Instruction Formats, Addressing Modes, Data Transfer and Manipulation, RISC Vs CISC.

**UNIT-3**

**Pipelining:** Parallel and pipeline Processing, Pipeline Control, Pipeline Implementations, Conflicts Resolution, and Pipeline Hazards, Vector Processing, and Array Processors.

**Memory Organization:** Memory Systems: principle of locality, principles of memory hierarchy Caches, associative memory, main memory, Virtual memory, Paging and Segmentation, Memory Interleaving.

**UNIT-4**

**Input Output Organization:** I/O performance measures, types and characteristics of I/O devices, I/O Modes-Programmed I/O, Interrupt Initiated I/O and DMA.Buses: connecting I/O devices to processor and memory, interfacing I/O devices to memory, processor, and operating system.

**Parallel Computers:** Classification, SIMD, MIMD Organizations, Connection Networks, Data Flow Machines, and Multithreaded Architectures

**Text Books :**


1. D. A. Patterson and J. L. Hennessy, *Computer Organization and Design MIPS Edition: The Hardware/Software Interface*, Newnes.
2. C. Hamacher and Z. Vranesic, *Computer Organization 5th Edition.* ,
3. Gill Nasib Singh and Dixli J.B., Digital Design and Computer Organisation, University Science Press (An Imprint of Laxmi Publications Pvt. Ltd.), New Delhi.


**Reference Books :**


1. W. Stallings, *Computer Organization and Architecture: Designing for Performance*, Pearson-Prentice Hall.
2. Zacker, *Networking: The Complete Reference*, Tata McGraw-Hill Education
3. J. P. Hayes, *Computer Architecture and Organization*, WCB McGraw-Hill

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## Data Structure & Algorithms Lab

**BT CS 304**

L - T -P
0 - 0 - 2

1. Write a program to search an element in a two-dimensional array using linear search.
2. Using iteration & recursion concepts write programs for finding the element in the array using Binary Search Method
3. Write a program to perform following operations on tables using functions only a) Addition b) Subtraction c) Multiplication d) Transpose
4. Using iteration & recursion concepts write the programs for Quick Sort Technique
5. Write a program to implement the various operations on string such as length of string concatenation, reverse of a string & copy of a string to another.
6. Write a program for swapping of two numbers using 'call by value' and 'call by reference strategies.
7. Write a program to implement binary search tree. (Insertion and Deletion in Binary search Tree)
8. Write a program to create a linked list & perform operations such as insert, delete, update, reverse in the link list
9. Write the program for implementation of a file and performing operations such as insert, delete, update a record in the file.
10. Create a linked list and perform the following operations on it
    a) add a node b) Delete a node
11. Write a program to simulate the various searching & sorting algorithms and compare their timings for a list of 1000 elements.
12. Write a program to simulate the various graph traversing algorithms.
13. Write a program which simulates the various tree traversal algorithms.

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## Digital Electronics Lab

**BT CS 305**

**L-T-P**
**0- 0- 2**

1. Study of TTL gates – AND, OR, NOT, NAND, NOR, EX-OR, EX-NOR.
2. Design & realize a given function using K-maps and verify its performance.
3. Design of half adder and full adder using NAND gates.
4. To verify the operation of multiplexer & Demultiplexer.
5. To verify the operation of comparator.
6. To verify the truth tables of S-R, J-K, T & D type flip flops.
7. Set up R-S & JK flip flops using NAND Gates.
8. To verify the operation of bi-directional shift register.
9. To design & verify the operation of 3-bit synchronous counter.
10. To design and verify the operation of synchronous UP/DOWN decade counter using J K flip-flops & drive a seven-segment display using the same.
11. To design and verify the operation of asynchronous UP/DOWN decade counter using J K flip-flops & drive a seven-segment display using the same.
12. Study of MUX & DeMUX Circuits and ICs

**NOTE:** At least ten experiments are to be performed; atleast seven experiments should be performed from above list. Remaining three experiments may either be performed from the above list or designed & set by the concerned institution as per the scope of the syllabus.



Fourth Semester
Database Management Systems

BT CS 401

L-T-P
3- 1- 0

**UNIT-1**

**Introduction:** An overview of database management system, database system Vs file system, Database system concepts and architecture, data models schema and instances, data independence and data base language and interfaces, Data definitions language, DML, Overall Database Structure.

**Data Modeling using the Entity Relationship Model:**
ER model concepts, notation for ER diagram, mapping constraints, keys, Concepts of Super Key, candidate key, primary key, Generalization, aggregation, reduction of an ER diagrams to tables, extended ER model.

**UNIT-2**

**Relational data Model and Language:** Relational data model concepts, integrity constraints: entity integrity, referential integrity, Keys constraints, Domain constraints, relational algebra, relational calculus, tuple and domain calculus.

**Introduction to SQL:** Characteristics of SQL. Advantage of SQL. SQL data types and literals. Types of SQL commands. SQL operators and their procedure. Tables, views and indexes. Queries and sub queries. Aggregate functions. Insert, update and delete operations. Joins, Unions, Intersection, Minus, Cursors in SQL.

**UNIT-3**

**Data Base Design & Normalization:** Functional dependencies, normal forms, first, second, third normal forms, BCNF, inclusion dependences, loss less join decompositions, normalization using FD, MVD, and JDs, alternative approaches to database design.

**Transaction Processing Concepts:** Transaction system, Testing of serializability, Serializability of schedules, conflict & view serializable schedule, recoverability, Recovery from transaction failures, log based recovery, checkpoints, deadlock handling.

**UNIT-4**

**Crash Recovery:** Failure classification, recovery concepts based on deferred update, recovery concepts based on intermediate update, shadow paging, check points, on-line backup during database updates

**Concurrency Control Techniques:** Concurrency control, locking Techniques for concurrency control, Time stamping protocols for concurrency control, validation based protocol, multiple granularity, Multi version schemes, Recovery with concurrent transaction.

**Text Books:**


1. A.Silberschatz, H.F. Korth and S. Sudarshan,"Database System Concepts" 6th edition. McGraw-Hill, International Edition.
2. Bipin Desai,"Introduction to Database Management system" Revised Edition, Galgotia Pub.
3. Shyamkant B. Navathe,"Fundamental of Database systems" 7th Edition, Pearson.

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**Reference Books:**


1. R.Elmasri and S.B. Navathe,"Fundamentals of Database Systems" 3rd edition, Addision-Wesley, Low Priced Edition.
2. C.J. Date,"An Introduction to Database Systems", 8th edition, Pearson.
3. C.J.Date and S. Swamynathan, "An Introduction to database system",8th Edition, Pearson Education.
4. Shio Kumar Singh,"Database System Concepts, designs and applications", 2nd Edition, Pearson Education.

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## Object Oriented Programming using C++

BT CS 402

L-T-P
3-1-0

UNIT-1

**Object oriented thinking**: Need for OOP Paradigm, Procedural programming vs object oriented programming, object oriented concepts.

**Functions**: Main function, function prototyping, inline functions, reference variables, call by reference, Defaults arguments, Function overloading, Math library functions.

UNIT-2

**Class**: Difference between C structure and class, specifying a class, Defining member functions: inside and outside class, scope resolution operator, Array within a class, array of objects, Static data members and member functions, Object as function arguments, Returning objects, Friend function, memory allocation for objects, Pointer to Members, pointer to object, This pointer local classes.

**Constructor and destructor**: Constructor, Types of constructors: Default, Parameterized and Copy constructor, Constructor overloading, constructor with default parameter, Dynamic initialization of objects, Destructor

UNIT-3

**Operator overloading and Type Conversion:** Defining operator overloading, overloading unary and binary operator, Data Conversion: Basic to User Defined , User defined to basic, Conversion from one user-defined to other.

**Inheritance and polymorphism**: Base class, derived class, visibility modes, derivation and friendship, Types of inheritance, Containership, virtual function binding, pure virtual functions, Abstract class, pointer to derived class.

UNIT-4

**Console IO operations**: C++ stream classes, Unformatted IO operations, formatted IO operations, managing output with manipulators.

**Working with files**: Classes for file stream operations, opening and closing files, detection of File opening modes, file Pointers, Error handling during file operations, command line arguments. Templates: Class template, class template with parameter, function template, function template with parameter.

**Text Books and Reference Books:**


1. Bjrane Stroustrup, "C++ Programming language",3rd edition, Pearson education Asja
2. Lafore R."Object oriented Programming in C++",4th Ed. Techmedia, New Delhi.
3. Yashwant Kenetkar,"Let us C++",1stEd.,Oxford University Press.
4. B.A. Forouzan and R.F. Gilberg,CompilerScience,"A structured approach using C++" Cengage Learning, New Delhi.

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## Economics

**BT- ECO-507A** **L-T-P**
**3-0-0**

**Unit-1**
**Introduction to Economics**
Definition of Economics-various definitions, circular flow of economic activity, Production possibility curve Economic laws and their nature. Relation between Science, Engineering, Technology and Economics. Concepts and measurement of utility, Law of Diminishing Marginal Utility, Law of equi-marginal utility - its practical application and importance, the concept of equilibrium

**Unit-2**
**Market Demand**
Meaning of Demand, Individual and Market demand schedule, Law of demand, shape of demand curve, Elasticity of demand, measurement of elasticity of demand, factors effecting elasticity of demand, practical importance & applications of the concept of elasticity of demand, the indifference curve theory, consumers surplus

**Unit-3**
**Various Concepts of Cost**
Objective of business firm, Meaning of production and factors of production; Law of variable proportions, Returns to scale, Internal and External economics and diseconomies of scale. Various concepts of cost - Fixed cost, variable cost, average cost, marginal cost, money cost, real cost opportunity cost. Shape of average cost, marginal cost, total cost etc. in short run and long run.

**Unit-4**
**Types of Market**
Meaning of Market, Types of Market - Perfect Competition, Monopoly, Oligoply, Monoplistic Competition (Main features of these markets) Supply and Law of Supply, Role of Demand & Supply in Price Determination and effect of changes in demand and supply on prices.
Nature and characteristics of Indian economy (brief and elementary introduction), national income concept, Privatization - meaning, merits and demerits, Balance of payment, Globalization of Indian economy - merits and demerits. Elementary Concepts of VAT, WTO, GATT & TRIPS agreement, IMF, World Bank.

**Text Books:**
1. P.N. Chopra,"Principles of Economics", (Kalyani Publishers).
2. K.K. Dewett," Modern Economic Theory" (S.Chand).
3. Stonier and Hague,"A Text Book of Economic Theory", (Longman's Landon)

**Reference Books:**
1. M.L. Jhingan," Micro Economic Theory", (S.Chand)
2. H.L. Ahuja,"Micro Economic Theory", (S.Chand)
3. S.K. Mishra,"Modern Micro Economics", (Pragati Publications) .
4. Mishra &Puri ,"Indian Economy".

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## Environmental Sciences

**BT AUD 308A** **L-T-P**

**3- 0- 0**

**UNIT-1**

**Introduction to Environmental Science and Natural Resources**

The multidisciplinary nature of Environmental Studies. Definition, scope and importance, need for public awareness

Renewable and non-renewable resources: Land resources: Land as a resource, land degradation, soil erosion and desertification. Forest resources: Use and over-exploitation, deforestation, case studies. Water resources: Use and over-utilization of surface and ground water

**UNIT-2**

**Ecosystems, Biodiversity and its Conservation**

Concept of an ecosystem. Structure and function of an ecosystem. Energy flow in the ecosystem. Food chains, food webs and ecological pyramids.

Definition: genetic, species and ecosystem diversity. Bio-geographical classification of India. Hot-spots of biodiversity. Threats to biodiversity. Endangered and endemic species of India. Conservation of biodiversity.

**UNIT-3**

**Environmental Pollution, Environment policies & laws**

Definition, Causes, effects and control measures of: (a) Air pollution (b) Water pollution (c) Soil pollution (d) Marine pollution (e) Noise pollution (f) Nuclear hazards. Solid waste management. Pollution case studies.

Environment Protection Act. Air (Prevention and Control of Pollution) Act. Water (Prevention and Control of Pollution) Act. Wildlife Protection Act. Forest Conservation Act. Issues involved in enforcement of environmental legislation. Public awareness.

**UNIT-4**

**Human Population and Environment and Fieldwork**

Human population growth, Impacts on environment, human health and welfare. Environmental Movements: Chipko, silent valley, Bishnois of Rajasthan.

Visit to a local area to document environmental assets—river/forest/grassland/hill/ mountain. Visit to a local polluted site—Urban/Rural/Industrial/Agricultural.Study of common plants, insects, birds. Study of simple ecosystems—pond, river, hill slopes, etc.

**Text Books and Reference books:**


1. Cunningham, W.P. and Saigo, B.W., Environmental Science. W.M.C. Brown Publishers, New York, USA.
2. Enger, D.E. and Smith B.F., Environment Science–A Study of Interrelationships. W.M.C. Brown Publishers, New York, USA.
3. Gupta, P.K., Elements of Biotechnology, Rastogi Publications, Meerut.


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4. Negi, B.S., Geography of Resources, Kedar Nath Ram Nath, Meerut.
5. Odum, E.P., Fundamentals of Ecology, Natraj Publishers, Dehradun.
6. Kaushik A' and Kaushik C P. Perspectives in Environmental Studies, New age International Publishers, New Delhi.
7. Rastogi, V.B., Environmental Biology and Biochemistry, Kedar Nath Ram Nath, Meerut and Delhi.

## Discrete Structures

**BT CS 403**

**L-T-P**
**3-0-0**

**UNIT-1**
**Set Theory**: Algebra of sets, Classes of sets, Power Sets, Multi sets, Cartesian Product, Representation of relations, Types of relation, Equivalence relations and partitions, Partial ordering relations.
**Recursion And Recurrence Relation**: Linear recurrence relation with constant coefficients, Homogeneous solutions, Particular solutions, Total solution of a recurrence relation using generating functions.

**UNIT-2**
**Propositional Calculus**: Basic operations: AND (^), OR (v), NOT (~), Implication and bi-implication, Truth value of a compound statement, propositions, tautologies, contradictions, Universal and Existential quantifiers, methods of proof, Mathematical Induction, Propositional logic, Hypothesis and Inference.
**Techniques of Counting**: Permutations with and without repetition, Combination, Pigeonhole principle.

**UNIT-3**
**Algebric Structures**: Definition and examples of a monoid, Semigroup, Groups and rings, Homomorphism, Isomorphism and Automorphism, Subgroups and Normal subgroups, Cyclic groups, Integral domain and fields, Cosets, Lagrange's theorem.

**UNIT-4**
**Graphs**: Introduction to graphs, Directed and Undirected graphs, Homomorphic and Isomorphic graphs, Subgraphs, Cut points and Bridges, Multigraph and Weighted graph, Paths and circuits, Shortest path in weighted graphs, Eurelian path and circuits, Hamilton paths and circuits, Planar graphs, Euler's formula, Coloring graph problem, Bipartite graphs, Travelling salesman problem, Trees, Spanning trees.

**Text Books:**

1 B. Kolman, R. Busby, and S. C. Ross, *Discrete Mathematical Structures*, 6 edition. Upper Saddle River, NJ: Pearson.
2 C.L. Liu, and · Mohapatra, *Elements of Discrete Mathematics: A Computer Oriented Approach*, 4th edition. New York: Mc Graw Hill India.
3 B. Ram, *Discrete Mathematics*, 1 edition. Pearson.
4 J.-P. Tremblay and R. Manohar, *Discrete Mathematical Structures with Applications to Computer Science*, 1 edition. New Delhi, India: McGraw Hill Education.

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**Reference Books:**


1. J. L. Gersting, *Mathematical Structures for Computer Science*, 6th Edition edition. New York: W. H. Freeman.
2. S. Lipschutz, M. L. Lipson, and V. H. Patil, *Discrete Mathematics*, Revised Third edition. McGraw Hill Education.
3. R. Johnsonbaugh, *Discrete Mathematics*, 7 edition. Upper Saddle River, N.J: Pearson.
4. A. Doerr and K. Levasseur, *Applied Discrete Structures for Computer Science*, Subsequent edition. New York: Macmillan Coll Div.

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## Database Management System Lab

**BT CS 404**

**L-T-P**
**0- 0- 2**

1. Write the queries for Data Definition and Data Manipulation language.
2. Write SQL queries using Logical operators (=,<,>,etc.).
3. Write SQL queries using SQL operators (Between.... AND, IN(List), Like, ISNULL and also with negating expressions ).
4. Write SQL query using character, number, date and group functions.
5. Write SQL queries for Relational Algebra (UNION, INTERSECT, and MINUS, etc.).
6. Write SQL queries for extracting data from more than one table (Equi-Join, Non-Equi-Join , Outer Join)
7. Write SQL queries for sub queries, nested queries.
8. Write programs by the use of PL/SQL.
9. Concepts for ROLL BACK, COMMIT & CHECK POINTS.
10. Create VIEWS, CURSORS, and TRIGGRS & write ASSERTIONS.
11. Create FORMS and REPORTS.
12. Creation, altering and droping of tables and inserting rows into a table (use constraints while creating tables) examples using SELECT command.
13. Queries (along with sub Queries) using ANY, ALL, IN, EXISTS, NOTEXISTS, UNION, INTERSET, Constraints. Example:- Select the roll number and name of the student who secured fourth rank in the class.
14. Queries using Aggregate functions (COUNT, SUM, AVG, MAX and MIN), GROUP BY, HAVING and Creation and dropping of Views.
15. Queries using Conversion functions (to_char, to_number and to_date), string functions (Concatenation, lpad, rpad, ltrim, rtrim, lower, upper, initcap, length, substr and instr), date functions (Sysdate, next_day, add_months, last_day, months_between, least, greatest, trunc, round, to_char, to_date)
16. i) Creation of simple PL/SQL program which includes declaration section, executable section and exception –Handling section (Ex. Student marks can be selected from the table and printed for those who secured first class and an exception can be raised if no records were found)
ii) Insert data into student table and use COMMIT, ROLLBACK and SAVEPOINT in PL/SQL block.
17. Develop a program that includes the features NESTED IF, CASE and CASE expression. The program can be extended using the NULLIF and COALESCE functions.
18. Program development using WHILE LOOPS, numeric FOR LOOPS, nested loops using ERROR Handling, BUILT –IN Exceptions, USE defined Exceptions, RAISE- APPLICATION ERROR.
20. Program development using creation of stored functions, invoke functions in SQL Statements and write complex functions.
21. Program development using creation of package specification, package bodies, private objects, package variables and cursors and calling stored packages.
22. Develop programs using features parameters in a CURSOR, FOR UPDATE CURSOR, WHERE CURRENT of clause and CURSOR variables.

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## C++ Programming Lab

**BT CS 405** L-T-P
0- 0- 2

1. Write a program to read a matrix of size m x n form the keyboard and display the same using function.
2. Program to make the use of inline function.
3. Write a function power () which raise a number m to a power n. The function takes double value of m and integer value of n and returns the result. Use a default value of n is 2 to make the function to calculate squares when this argument is omitted.
4. Program to show that the effect of default arguments can be alternatively achieved by overloading.
5. Write a class ACCOUNT that represents your bank account and then use it.
The class should allow you to deposit money, withdraw money, calculate interest,
send you a message if you have insufficient balance.
6. Write a class STRING that can be used to store strings, add strings, equate string, output strings.
7. Create the class TIME to store time in hours and minutes. Write a friend function to add two TIME objects.
8. Create two classes DM and DB. DM stores the distance in meter and centimeters and DB stores the distance in feet and inches. Write a program two add object of DM with the object of DB class.
9. Write a program to create an abstract class named Shape that contains an empty method named number Of Sides ( ).Provide three classes named Trapezoid, Triangle and Hexagon such that each one of the classes inherits the class Shape. Each one of the classes contains only the method number Of Sides ( ) that shows the number of sides in the given geometrical figures.
10. Program to demonstrate the concept of:
*a. Default constructor*
*b. Parameterized constructor*
*c. Copy constructor*
*d. Constructor overloading*
11. Program to demonstrate the concept of destructor.
12. Program to show multiple inheritance
13. Program to show multilevel inheritance
14. Program to show hybrid inheritance
15. Program to show the concept of containership.
16. Program to overload unary operator.
17. Program to overload binary operator
18. Program to show the concept of run time polymorphism using virtual function.
19. Program to work with formatted and unformatted IO operations.
20. Program to read the name and roll numbers of students from keyboard and write them into a file and then display it.
21. Program to copy one file onto the end of another, adding line numbers
22. Write a function template for finding the minimum value contained in an array.