1. **Conditions for Admission:**

(a) Candidates for admission to the first semester of the 8 semester B.Tech Degree programme should be required to have passed:

The Higher Secondary Examination of the (10+2) curriculum (Academic Stream) prescribed by the Government of Tamil Nadu or any other examination equivalent there to with minimum of 45% marks (a mere pass for OBC and SC/ST candidates) in aggregate of subjects – Mathematics, Physics and any one of the following optional subjects: Chemistry / Biotechnology / Computer Science / Biology (Botany & Zoology) or an Examination of any University or Authority recognized by the Executive Council of the Pondicherry University as equivalent thereto.

(b) For Lateral entry in to third semester of the eight semester B.Tech programme:

The minimum qualification for admission is a pass in three year diploma or four year sandwich diploma course in engineering / technology with a minimum of 60 % marks ( 50% marks for OBC and a mere pass for SC/ST candidates) in aggregate in the subjects covered from 3rd to final semester or a pass in any B.Sc. course with mathematics as one of the subjects of study with a minimum of 60 % marks ( 50% marks for OBC and a mere pass for SC/ST candidates) in aggregate in main and ancillary subjects excluding language subjects. The list of diploma programs approved for admission for each of the degree programs is given in Annexure A.

2. **Age Limit:**

The candidate should not have completed 21 years of age as on 1st July of the academic year under consideration. For Lateral Entry admission to second year of degree programme , candidates should not have completed 24 years as on 1st July of the academic year under consideration. In the case of SC/ST candidates, the age limit is relaxable by 3 years for both the cases.

3. **Duration of Programme:**

The Bachelor of Technology degree programme shall extend over a period of 8 consecutive semesters spread over 4 academic years – two semesters constituting one academic year. The duration of each semester shall normally be 15 weeks excluding examinations.
4. **Eligibility for the award of Degree:**

No candidate shall be eligible for the award of the degree of Bachelor of Technology, unless he/she has undergone the course for a period of 8 semesters (4 academic years) / 6 semesters (3 academic years for Lateral Entry candidates) in the faculty of Engineering and has passed the prescribed examinations in all the semesters.

5. **Branches of Study:**

- Branch I - Civil Engineering
- Branch II - Mechanical Engineering
- Branch III - Electronics & Communication Engineering
- Branch IV - Computer Science & Engineering
- Branch V - Electrical & Electronics Engineering
- Branch VI - Chemical Engineering
- Branch VII - Electronics & Instrumentation Engineering
- Branch VIII - Information Technology
- Branch IX - Instrumentation & Control Engineering
- Branch X - Biomedical Engineering

or any other branches of study as and when offered. The branch allocation shall be ordinarily done at the time of admission of the candidate to the first semester.

6. **Subjects of Study:**

The subjects of study shall include theory and practical courses as given in the curriculum and shall be in accordance with the prescribed syllabus. The subjects of study for the first two semesters shall be common for all branches of study.

7. **Examinations:**

The theory and practical examinations shall comprise continuous assessment throughout the semester in all subjects as well as university examinations conducted by Pondicherry University at the end of the semester (November / December or April / May).

(a) Theory courses for which there is a written paper of 75 marks in the university examination.

The Internal Assessment marks of 25 has to be distributed as 10 marks each for two class tests and 5 marks for class attendance in the particular subject. The distribution of marks for attendance is as follows.

- 5 marks for 95% and above
- 4 marks for 90% and above but below 95%
- 3 marks for 85% and above but below 90%
- 2 marks for 80% and above but below 85%
- 1 mark for 75% and above but below 80%
In total, three tests are to be conducted and the better two are to be considered for assessment.

(b) Practical courses for which there is a university practical examination of 50 marks:
The internal assessment marks of 50 has to be distributed as 20 marks for the periodic practical works and records submitted thereof, 15 marks for an internal practical examination, 5 marks for an internal viva voce, and 10 marks for class attendance in the particular subject. The distribution of marks is as given below.

- 10 marks for 95% and above
- 8 marks for 90% and above but below 95%
- 6 marks for 85% and above but below 90%
- 4 marks for 80% and above but below 85%
- 2 marks for 75% and above but below 80%

8. Requirement for appearing for University Examination:

A candidate shall be permitted to appear for university examinations at the end of any semester only if:

(i) He / She secures not less than 75% overall attendance arrived at by taking into account the total number of periods in all subjects put together offered by the institution for the semester under consideration.

(Candidates who secure overall attendance greater than 60% and less than 75% have to pay a condonation fee as prescribed by University along with a medical certificate obtained from a medical officer not below the rank of Asst. Director)

(ii) He / She earns a progress certificate from the Head of the institution for having satisfactorily completed the course of study in all the subjects pertaining to that semester.

(iii) His / Her conduct is found to be satisfactory as certified by the Head of the institution.

A candidate who has satisfied the requirement (i) to (iii) shall be deemed to have satisfied the course requirements for the semester.

9. Procedure for completing the course:

A candidate can join the course of study of any semester only at the time of its normal commencement and only if he/she has satisfied the course requirements for the previous semester and further has registered for the university examinations of the previous semester in all the subjects as well as all arrear subjects if any.

However, the entire course should be completed within 14 consecutive semesters (12 consecutive semesters for students admitted under lateral entry).
10. **Passing Minimum:**

(i) A candidate shall be declared to have passed the examination in a subject of study only if he/she secures not less than 50% of the total marks (Internal Assessment plus University examination marks) and not less than 40% of the marks in University examination.

(ii) A candidate who has been declared “Failed” in a particular subject may reappear for that subject during the subsequent semesters and secure a pass. However, there is a provision for revaluation of failed or passed subjects provided he/she fulfills the following norms for revaluation.

(a) Applications for revaluation should be filed within 4 weeks from the date of declaration of results or 15 days from the date of receipt of marks card whichever is earlier.

(b) The candidate should have attended all the college examinations as well as university examinations.

(c) If a candidate has failed in more than two papers in the current university examination, his/her representation for revaluation will not be considered.

(d) The request for revaluation must be made in the format prescribed duly recommended by the Head of the Institution along with the revaluation fee prescribed by the University.

The internal assessment marks obtained by the candidate shall be considered only in the first attempt for theory subjects alone. For the subsequent attempts, University examination marks will be made up to the total marks. Further the University examination marks obtained in the latest attempt shall alone remain valid in total suppression of the University examination marks obtained by the candidate in earlier attempts.

11 **Award of Letter Grades:**

The assessment of a course will be done on absolute marks basis. However, for the purpose of reporting the performance of a candidate, letter grades, each carrying certain points, will be awarded as per the range of total marks (out of 100) obtained by the candidate, as detailed below:
<table>
<thead>
<tr>
<th>Range of Total Marks</th>
<th>Letter Grade</th>
<th>Grade Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>90 to 100</td>
<td>S</td>
<td>10</td>
</tr>
<tr>
<td>80 to 89</td>
<td>A</td>
<td>9</td>
</tr>
<tr>
<td>70 to 79</td>
<td>B</td>
<td>8</td>
</tr>
<tr>
<td>60 to 69</td>
<td>C</td>
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<td>55 to 59</td>
<td>D</td>
<td>6</td>
</tr>
<tr>
<td>50 to 54</td>
<td>E</td>
<td>5</td>
</tr>
<tr>
<td>0 to 49</td>
<td>F</td>
<td>0</td>
</tr>
<tr>
<td>Incomplete</td>
<td>FA</td>
<td></td>
</tr>
</tbody>
</table>

‘F’ denotes failure in the course. ‘FA’ denotes absent / detained as per clause 8.

After results are declared, grade sheets will be issued to the students. The grade sheets will contain the following details:

(a) The college in which the candidate has studied.

(b) The list of courses enrolled during the semester and the grades scored.

(c) The Grade Point Average (GPA) for the semester and The Cumulative Grade Point Average (CGPA) of all enrolled subjects from first semester onwards.

(d) GPA is the ratio of sum of the products of the number of credits (C) of courses registered and the corresponding grades points (GP) scored in those courses, taken for all the courses and sum of the number of credits of all the courses

\[
GPA = \frac{\text{Sum of } (C \times GP)}{\text{Sum of } C}
\]

CGPA will be calculated in a similar manner, considering all the courses enrolled from first semester. FA grades are to be excluded for calculating GPA and CGPA.

The conversion of CGPA into percentage marks is as given below

\[
\% \text{ Marks} = (CGPA - 0.5) \times 10
\]

12 Award of Class and Rank:

(i) A candidate who satisfies the course requirements for all semesters and who passes all the examinations prescribed for all the eight semesters (six semesters for lateral entry candidates) within a maximum period of 7 years (6 years for lateral entry candidates) reckoned from the commencement of the first semester to which the candidate was admitted shall be declared to have qualified for the award of degree.

(ii) A candidate who qualifies for the award of the degree passing in all subjects pertaining to semesters 3 to 8 in his/her first appearance within 6 consecutive semesters (3 academic years) and in addition secures a CGPA of 8.50 and above for the semesters 3 to 8 shall be declared to have passed the examination in **FIRST CLASS** with **DISTINCTION**.
(iii) A candidate who qualifies for the award of the degree by passing in all subjects relating to semesters 3 to 8 within a maximum period of eight semesters after his/her commencement of study in the third semester and in addition secures CGPA not less than 6.5 shall declared to have passed the examination in **FIRST CLASS**.

(iv) All other candidates who qualify for the award of degree shall be declared to have passed the examination in **SECOND CLASS**.

(v) For the Award of University ranks and Gold Medal for each branch of study, the CGPA secured from 1st to 8th semester alone should be considered and it is mandatory that the candidate should have passed all the subjects from 1st to 8th semester in the first attempt. Rank certificates would be issued to the first ten candidates in each branch of study.

13. **Provision for withdrawal:**

A candidate may, for valid reasons, and on the recommendation of the Head of the Institution be granted permission by the University to withdraw from writing the entire semester examination as one Unit. The withdrawal application shall be valid only if it is made earlier than the commencement of the last theory examination pertaining to that semester. Withdrawal shall be permitted only once during the entire course. Other conditions being satisfactory, candidates who withdraw are also eligible to be awarded **DISTINCTION** whereas they are not eligible to be awarded a rank.

14. **Discontinuation of Course:**

If a candidate wishes to temporarily discontinue the course for valid reasons, he/she shall apply through the Head of the Institution in advance and obtain a written order from the University permitting discontinuance. A candidate after temporary discontinuance may rejoin the course only at the commencement of the semester at which he/she discontinued, provided he/she pays the prescribed fees to the University. The total period of completion of the course reckoned from the commencement of the first semester to which the candidate was admitted shall not in any case exceed 7 years, including of the period of discontinuance.

15. **Revision of Regulations and Curriculum:**

The University may from time to time revise, amend or change the regulations of curriculum and syllabus as and when found necessary.
<table>
<thead>
<tr>
<th>B.Tech courses in which admission is sought</th>
<th>Diploma courses eligible for admission</th>
</tr>
</thead>
<tbody>
<tr>
<td>Civil Engineering</td>
<td>Civil Engineering</td>
</tr>
<tr>
<td></td>
<td>Civil and Rural</td>
</tr>
<tr>
<td></td>
<td>Engineering Architectural</td>
</tr>
<tr>
<td></td>
<td>Assistantship Architecture</td>
</tr>
<tr>
<td></td>
<td>Agricultural Engineering</td>
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<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Mechanical Engineering</td>
<td>Mechanical Engineering</td>
</tr>
<tr>
<td></td>
<td>Automobile Engineering</td>
</tr>
<tr>
<td></td>
<td>Agricultural Engineering</td>
</tr>
<tr>
<td></td>
<td>Mechanical and Rural</td>
</tr>
<tr>
<td></td>
<td>Engineering Refrigeration and</td>
</tr>
<tr>
<td></td>
<td>Air-conditioning Agricultural</td>
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<tr>
<td></td>
<td>Engineering &amp; Farm Equipment</td>
</tr>
<tr>
<td></td>
<td>Technology</td>
</tr>
<tr>
<td></td>
<td>Metallurgy</td>
</tr>
<tr>
<td></td>
<td>Production Engineering</td>
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<tr>
<td></td>
<td>Machine Design &amp; Drafting</td>
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<tr>
<td></td>
<td>Machine tool maintenance and Repairs</td>
</tr>
<tr>
<td></td>
<td>Printing Technology / Engineering</td>
</tr>
<tr>
<td></td>
<td>Textile Engineering / Technology</td>
</tr>
<tr>
<td></td>
<td>Tool Engineering</td>
</tr>
<tr>
<td>Electrical and Electronics Engineering</td>
<td>Electrical Engineering</td>
</tr>
<tr>
<td></td>
<td>Electrical and Electronics Engineering</td>
</tr>
<tr>
<td></td>
<td>Electronics and Instrumentation</td>
</tr>
<tr>
<td></td>
<td>Engineering</td>
</tr>
<tr>
<td></td>
<td>Instrumentation Engineering</td>
</tr>
<tr>
<td></td>
<td>Instrumentation Engineering / Technology</td>
</tr>
<tr>
<td></td>
<td>Electronics and Communication Engg.</td>
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<td></td>
<td>Electronics Engineering</td>
</tr>
<tr>
<td></td>
<td>Medical Electronics</td>
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<td>Instrumentation and Control Engineering</td>
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<tr>
<td></td>
<td>Applied Electronics</td>
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<td>Chemical Engineering</td>
<td>Chemical Engineering</td>
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<td></td>
<td>Chemical Technology</td>
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<td></td>
<td>Petrochemical</td>
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<tr>
<td></td>
<td>Technology Petroleum</td>
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<td>Engineering Ceramic</td>
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<td>Technology</td>
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<td>Plastic Engineering</td>
</tr>
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<td></td>
<td>Paper &amp; Pulp Technology</td>
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<td>Polymer Technology</td>
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Information Technology

Computer Science & Engineering

Computer Science and Engineering

Computer Technology

Electrical and Electronics Engineering

Electronics & Communication Engineering

Engineering Electronics & Instrumentation Engineering

Instrumentation Engineering / Technology
### I Semester

<table>
<thead>
<tr>
<th>Code No.</th>
<th>Name of the Subjects</th>
<th>Periods</th>
<th>Credits</th>
<th>Marks</th>
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<td>T</td>
<td>P</td>
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<tr>
<td>T101</td>
<td>Mathematics – I</td>
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<td>T104</td>
<td>Basic Electrical and</td>
<td>3</td>
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<tr>
<td></td>
<td>Electronics Engineering</td>
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<tr>
<td>T105</td>
<td>Engineering Thermodynamics</td>
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<tr>
<td>T106</td>
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<tr>
<td></td>
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<td>P101</td>
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<tr>
<td></td>
<td>Lab</td>
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<tr>
<td>P102</td>
<td>Engineering Graphics</td>
<td>2</td>
<td>-</td>
<td>3</td>
</tr>
<tr>
<td>P103</td>
<td>Basic Electrical and</td>
<td>-</td>
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<tr>
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<td>Total</td>
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*To be completed in I and II semesters, under Pass / Fail option only and not counted for CGPA calculation.*

### II Semester

<table>
<thead>
<tr>
<th>Code No.</th>
<th>Name of the Subjects</th>
<th>Periods</th>
<th>Credits</th>
<th>Marks</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>L</td>
<td>T</td>
<td>P</td>
</tr>
<tr>
<td>T107</td>
<td>Mathematics – II</td>
<td>3</td>
<td>1</td>
<td>-</td>
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<tr>
<td>T108</td>
<td>Material Science</td>
<td>4</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>T109</td>
<td>Environmental Science</td>
<td>4</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>T110</td>
<td>Basic Civil and</td>
<td>4</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Mechanical Engineering</td>
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<td></td>
</tr>
<tr>
<td>T111</td>
<td>Engineering Mechanics</td>
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<tr>
<td>T112</td>
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<td>Practicals</td>
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<td>P104</td>
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<td>P106</td>
<td>Workshop Practice</td>
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<td>P107</td>
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### III Semester

<table>
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<tr>
<th>Code No</th>
<th>Name of the Subjects</th>
<th>Theory</th>
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<th>T</th>
<th>P</th>
<th>IA</th>
<th>UE</th>
<th>TM</th>
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<tbody>
<tr>
<td>MA T31</td>
<td>Mathematics III</td>
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<tr>
<td>IT T32</td>
<td>Electronic Devices and circuits</td>
<td>4</td>
<td>-</td>
<td>-</td>
<td>4</td>
<td>25</td>
<td>75</td>
<td>100</td>
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<tr>
<td>IT T33</td>
<td>Principles of Programming Languages</td>
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<td>1</td>
<td>-</td>
<td>3</td>
<td>25</td>
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<td>100</td>
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<tr>
<td>IT T34</td>
<td>Digital System Design</td>
<td>3</td>
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<td>-</td>
<td>4</td>
<td>25</td>
<td>75</td>
<td>100</td>
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<tr>
<td>IT T35</td>
<td>Data Structures</td>
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<td>25</td>
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<tr>
<td>IT T36</td>
<td>Computer Organization and Architecture</td>
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<td>1</td>
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<td>IT P31</td>
<td>Electronic circuits lab</td>
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<td>-</td>
<td>3</td>
<td>2</td>
<td>50</td>
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<td>100</td>
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<td>IT P32</td>
<td>Digital lab</td>
<td>-</td>
<td>-</td>
<td>3</td>
<td>2</td>
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<td>IT P33</td>
<td>Data Structures lab</td>
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<td>3</td>
<td>2</td>
<td>50</td>
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Total: 19 5 9 28 300 600 900

### IV Semester

<table>
<thead>
<tr>
<th>Code No</th>
<th>Name of the Subjects</th>
<th>Theory</th>
<th>L</th>
<th>T</th>
<th>P</th>
<th>IA</th>
<th>UE</th>
<th>TM</th>
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<tbody>
<tr>
<td>MA T41</td>
<td>Discrete Mathematics and Graph Theory</td>
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<td>1</td>
<td>-</td>
<td>4</td>
<td>25</td>
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<tr>
<td>IT T42</td>
<td>Communication Engineering I</td>
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<tr>
<td>IT T43</td>
<td>Microprocessors and Applications</td>
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<td>1</td>
<td>-</td>
<td>4</td>
<td>25</td>
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<tr>
<td>IT T44</td>
<td>Design and analysis of algorithms</td>
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<td>1</td>
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<td>4</td>
<td>25</td>
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<tr>
<td>IT T45</td>
<td>Operating systems</td>
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<td>1</td>
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<td>4</td>
<td>25</td>
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<tr>
<td>IT T46</td>
<td>Object Oriented design and Programming</td>
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<td>1</td>
<td>-</td>
<td>4</td>
<td>25</td>
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<td>IT P41</td>
<td>Object Oriented Programming and Algorithms lab</td>
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<td>-</td>
<td>3</td>
<td>2</td>
<td>50</td>
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<td>IT P42</td>
<td>Microprocessor lab</td>
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<td>3</td>
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<td>IT P43</td>
<td>Operating Systems lab</td>
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Total: 19 5 9 29 300 600 900

* Under Pass / Fail option only and not accounted for CGPA calculation
## V Semester

<table>
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<tr>
<th>Code No</th>
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<th>Periods</th>
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<td>IT T53</td>
<td>Automata Languages and computation</td>
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<td>Java and Internet Programming</td>
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<td>System software and compilers</td>
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<td>Information Coding Techniques</td>
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## VI Semester

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### VII Semester

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<td>Embedded systems</td>
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<td>Project work (Phase I)</td>
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### VIII Semester

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<td>Management concepts and strategies</td>
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11
### Electives for 6th semester

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<tr>
<td>1</td>
<td>IT E61</td>
<td>Bio Informatics</td>
</tr>
<tr>
<td>2</td>
<td>IT E62</td>
<td>Parallel computing</td>
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<td>3</td>
<td>IT E63</td>
<td>Computer Graphics</td>
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<td>4</td>
<td>IT E64</td>
<td>Soft computing</td>
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<td>5</td>
<td>IT E65</td>
<td>Digital signal processing</td>
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<td>6</td>
<td>IT E66</td>
<td>Computer Hardware and Trouble shooting</td>
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### Electives for 7th semester

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<tbody>
<tr>
<td>1</td>
<td>IT E71</td>
<td>Mathematical statistics and numerical methods</td>
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<tr>
<td>2</td>
<td>IT E72</td>
<td>Business Process Management</td>
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<td>3</td>
<td>IT E73</td>
<td>Image processing</td>
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<td>4</td>
<td>IT E74</td>
<td>Web Technology</td>
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<td>IT E75</td>
<td>Mobile communication networks</td>
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<td>6</td>
<td>IT E76</td>
<td>User Interface Design</td>
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<td>IT E77</td>
<td>Software architecture</td>
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<td>GIS and Remote Sensing</td>
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<td>Unix Internals</td>
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### Electives for 8th semester

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<td>2</td>
<td>IT E82</td>
<td>Data mining and warehousing</td>
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<td>C# and .Net framework</td>
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<td>IT E89</td>
<td>Grid Computing</td>
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</table>
Unit I - Calculus
Curvature, radius of curvature, evolutes and involutes. Beta and Gamma functions and their properties.

Unit II - Multiple Integrals And Applications
Multiple integrals – change of order of integration. Applications: Areas (double integration) and volumes by triple integration (Cartesian and polar) – mass and center of mass (constant and variable densities).

Unit III - Analytical Solid Geometry
Directional cosines and ratios – angle between two lines – the equation of plane - equations to a straight line and shortest distance between two skew lines.

Unit IV - Differential Equations
Exact equations, First order linear equations, Bernoulli’s equation, orthogonal trajectories, growth and decay, geometrical applications and electric circuits. Equations not of first degree: equations solvable for p, equations solvable for y, equations solvable for x and Clairaut’s type.

Unit V - Differential Equations (Higher order)
Linear differential equations of higher order – with constant coefficients, the operator D - Euler’s linear equation of higher order with variable coefficients - simultaneous linear differential equations – solution by variation of parameters method – simple applications to electric circuits.

Text Books

Reference Books
Unit I – Acoustics & NDT

Ultrasonics - Ultrasonic Waves Productions (Piezoelectric & Magnetostriction method) – Detections (Acoustic Grating)

Acoustics - Factors affecting Acoustic of Buildings (Reverberation, Loudness, Focusing, Echo, Echelon Effect and Resonance) and their Remedies - Sabine’s formula for Reverberation Time

NDT applications - Pulse Echo Method - Liquid Penetrant Method

Unit II – Optics

Interference - Air Wedge – Michelson’s Interferometer – Wavelength Determination – Interference Filter – Antireflection Coatings

Diffraction - Diffraction Grating – Dispersive power of grating - Resolving Power of Grating & Prism


Unit III – Lasers & Fiber Optics


Fiber Optics - Principle and Propagation of light in optical fiber – Numerical aperture and acceptance angle – Types of optical fibers (material, refractive index, mode)

Unit IV – Wave mechanics


Unit V – Nuclear energy source


Text Books


Reference Books

Unit I - Water

Unit II – Polymers

Unit III - Electrochemical Cells
Galvanic cells, single electrode potential, standard electrode potential, electromotive series. EMF of a cell and its measurement. Nernst equation. Electrolyte concentration cell. Reference electrodes-hydrogen calomel, Ag /AgCl & glass electrodes. Batteries - primary and secondary cells, lacanche cell, lead acid storage cell, Ni-Cd battery & alkaline battery. Fuel cells - \( H_2-O_2 \) fuel cell.

Unit IV - Corrosion And Its Control

Unit V - Phase Rule
Definition and derivation of phase rule. Application to one component system - water and sulphur systems. Thermal analysis, condensed phase rule. Two component alloy systems - Pb-Ag, Cu-Ni and Mg-Zn systems.

Text books

Reference Books
Part A - Electrical
Unit – I

Unit – II
Node and mesh methods of analysis of DC circuits and simple AC circuits. Introduction to three phase circuits, Introduction to three phase system - phase and line parameters – relations, power measurement – voltmeter and ammeter method, two and three wattmeter methods.

Unit – III
Principle of DC generator and motor, Transformer, synchronous generator, induction motor (single phase). Sources for electrical energy conversion-thermal and hydraulic plant (Block diagram approach only). Components of AC transmission and distributions systems – line diagram.

Part B – Electronics
Unit – IV
Half-wave rectifier and Full-wave rectifier- filters - Amplifiers-common emitter and common collector amplifiers- Hartley oscillator and RC phase shift oscillator. Transducers – Resistance temperature detector (RTD) – Linear variable differential transformer (LVDT) - Strain gauge – Piezo electric transducer.

Unit – V

Unit – VI
Model of communication system – Analog and digital – Wired and wireless channel. Block diagram of various communication systems – Microwave, satellite, optical fiber and cellular mobile system. Network model – LAN, MAN and WAN – Circuit and packet switching – Overview of ISDN.

Text Books

Reference Books
Unit I  - Basic Concepts and Definitions
Energy conversion and efficiencies - System, property and state - Thermal equilibrium - Temperature - Zeroth law of Thermodynamics.

Unit II  - First Law of Thermodynamics
The concept of work and adiabatic process - First law of thermodynamics - Conservation of Energy principle for closed and open systems - Calculation of work for different processes of expansion of gases

Unit III  - Second Law of Thermodynamics
Equilibrium and the second law - Heat engines - Kelvin-Planck statement of second law of thermodynamics - Reversible and irreversible processes - Carnot principle - Clausius inequality-Entropy

Unit IV  - Gas Power Cycles
Air standard cycles: The air standard Carnot cycle - Air standard Otto cycle, diesel cycle, dual cycle and Bryton cycles and their efficiencies

Unit V  - Refrigeration Cycles and Systems
Reverse Carnot cycle - COP - Vapor compression refrigeration cycle and systems (only theory) - Gas refrigeration cycle - Absorption refrigeration system (only theory)- Liquifaction and solidification of gases

Text Books

Reference Books
Unit – I


Unit – II

Problem solving techniques – Program – Program development cycle – Algorithm design – Flowchart - Pseudo code.
Introduction to C – C tokens – data types – Operators and expressions – I/O functions

Unit – III

Decision making statements – branching and looping – arrays – multidimensional arrays – Functions – Recursion – Passing array to functions
Storage classes – Strings – String library functions

Unit – IV

Structures – Arrays and Structures – nested structures – passing structures to functions – user defined data types – Union
Pointers – pointers and arrays – pointers and functions - pointers and strings - pointers and structures

Unit – V

Files – operations on a file – Random access to files – command line arguments
Introduction to preprocessor – Macro substitution directives – File inclusion directives – conditional compilation directives – Miscellaneous directives

Text Books

Reference Book
List of Exercises

OS Commands, Word Processor and Spreadsheets
1. Study of OS commands-Compilation and execution of simple C programs
2. Use of mail merge in word processor
3. Use of spreadsheet to create Charts (XY, Bar, Pie) and apply the formulae wherever necessary C Programming (Flowcharts and algorithms are essential for the programming exercises)
4. Greatest of three numbers using conditional operator and if statement
5. Read two numbers and swap those two numbers using temporary variable and without using temporary variable.
6. Solve quadratic equation for different sets of inputs.
7. Use of Switch….Case statements
8. Generation of prime and Fibonacci series
9. Evaluate the COSINE series using for, while and do while loops
10. Matrix operations
   a) Addition
   b) Transpose
   c) Multiplication
11. Evaluate the sin(x) series using functions and recursive functions
12. Read a string and find solution to remove the duplicates of a given string from the given sentence
13. Create an array of structures for a list of items with the following details

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<thead>
<tr>
<th>Item - Code</th>
<th>Item_ Name</th>
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<tbody>
<tr>
<td>102</td>
<td>Paste – Colgate</td>
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<tr>
<td>102</td>
<td>Paste – Pepsodent</td>
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<tr>
<td>102</td>
<td>Paste – Close-up</td>
</tr>
<tr>
<td>101</td>
<td>Soap – Cinthol</td>
</tr>
<tr>
<td>101</td>
<td>Soap – Lux</td>
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<td>Soap – Hamam</td>
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<td>Soap – Dove</td>
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Arrange the set of items in ascending order of its Item_Code and descending order of its Item_name as given below

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<th>Item_Name</th>
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<tbody>
<tr>
<td>101</td>
<td>Soap – Lux</td>
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<td>Soap – Hamam</td>
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<td>Soap – Dove</td>
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<td>Paste – Pepsodent</td>
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<td>Paste – Colgate</td>
</tr>
<tr>
<td>102</td>
<td>Paste – Close-up</td>
</tr>
</tbody>
</table>

14. Use of Structure to define a user defined data types, input the data and write the data into the file
15. Use of pointers and array of pointers
16. Functions with static data types
17. Write command line program to implement the following DOS commands using files
   - Del
   - Copy
Unit 0
Introduction to Standards for Engineering Drawing practice, Lettering, Line work and Dimensioning

Unit I
Conic sections, Involute, Spirals, Helix. Projection of Points, Lines and Planes

Unit II
Projection of Solids and Sections of Solids.

Unit III
Development of surfaces - Intersection of surfaces (cylinder-cylinder, cylinder-cone)

Unit IV
Isometric projections and Orthographic projections

Unit V
Computer Aided Drafting: Introduction to Computer Aided Drafting hardware - Overview of application software - 2D drafting commands (Auto CAD) for simple shapes - Dimensioning.

Text Books

Reference Books
Electrical Lab

1. Study of tools and accessories
2. Study of joints
3. Staircase wiring
4. Doctor’s room wiring
5. Godown wiring
6. Tube Light and Fan connection
7. Lamp controlled from three different places-wiring

Electronics Lab

1. Rectifiers
   Construction of half wave and full wave rectifiers with and without filters – Calculation of ripple factors.

2. Frequency Response of RC Coupled Amplifiers
   Determination of frequency response of given RC coupled amplifier - Calculation of bandwidth.

3. Verification of Kirchoff’s Voltage and Current Laws
   Determine the voltage and current in given circuits using Kirchoff’s laws theoretically and verify the laws experimentally.

4. Study of Logic Gates
   a. Verification of Demorgan’s theorems
   b. Verification of truth tables of OR, AND, NOT, NAND, NOR, EX-OR, EX-NOR gates and Flipflops - JK, RS, T and D
   c. Implementation of digital functions using logic gates

5. Study of CRO
   a. Measurement of AC and DC voltages
   b. Frequency and phase measurements (using Lissajou’s figures)

6. Study of Transducers
   a. Displacement and load measurements with transducers
   b. Temperature measurement with thermocouple
Unit I - Algebra
Binomial, exponential and logarithmic series (without proof) – problems on summation, approximation and coefficients.

Unit II – Matrices
Inverse of matrix by row transformation – Eigen values and Eigen vectors - Cayley-Hamilton theorem (without proof) – Diagonalisation – rank of matrix – solution of a general system of m linear algebraic equations in n unknowns (m \leq n).

Unit III – Trigonometry
Expansions for \( \sin^n \theta, \cos^n \theta, \tan^n \theta, \sin (n\theta), \cos(n\theta), \tan (n\theta) \). Exponential, circular, hyperbolic, inverse hyperbolic and logarithmic functions of a complex variable – separation of real and imaginary parts.

Unit IV - Vector Analysis
Scalar fields and Vector fields – Gradient, Divergence and Curl – their properties and relations – Gauss and Stokes theorems (without proof), simple problems for their verification.

Unit V - Statistics
Moments, kurtosis and skewness based on moments only. Probability distributions: Binomial, Poisson and Normal - evaluation of statistical parameters for these three distributions. Correlation and regression – rank correlation.

Text Books

Reference Book
Unit I - Crystal structure and Defects
Crystal Systems – Bravais Lattices – Coordination Number, Atomic Radius, Packing Factor for FCC & HCP structures – Miller Indices for a cubic crystal – Powder X Ray Diffraction Method - Lattice defects – Qualitative ideas of point, line, surface and volume defects

Unit II – Dielectric properties
Dielectric Polarization and Mechanism – Internal or local Field - Clausius-Mossotti relation – Dielectric loss - Temperature and frequency dependence of dielectric constant – Measurement of Dielectric constant and loss using Scherring bridge – Elementary ideas of Piezoelectrics, Ferroelectrics and Pyroelectric materials and its Applications

Unit III – Magnetic Properties

Unit IV – Semiconductors and superconductors

Unit V – Advanced Materials
Liquid Crystals – Types – Application as Display Devices – Metallic Glasses – Nanomaterials (one, Two & three Dimensional) – Physical Properties and Applications of Carbon Nano Tubes

Text books

Reference Books
Unit I - Environmental Segments And Natural Resources


Unit II - Ecosystem & Biodiversity


Unit III - Air Pollution

Air pollution-sources of air pollution. Sources, effects and control measures of oxides of nitrogen, oxides of sulphur, oxides of carbon, hydrocarbon, chlorofluro carbons and particulates. Green house effect-causes and effects on global climate and consequences. Ozone depletion-causes, mechanism and effect on the environment. Smog-sulfurous and photochemical smog-effect on the environment. Acid rain-theory of acid rain and effects.

Unit IV - Water Pollution And Solid Waste Management

Sources, effects and control measures of –water pollution, soil pollution, marine pollution, noise pollution, thermal pollution and radioactive pollution. Solid waste management – causes, effect and control measures of urban and industrial wastes.

Unit V - Social Issues And The Environment

Text Books

Reference Books
2) Sodhi G. S., Fundamental concepts of environmental chemistry, Narosa publishing house, New Delhi
Part-A Civil Engineering

Unit I - Buildings, Building Materials
Buildings-Definition-Classification according to NBC-plinth area, Floor area, carpet area, floor space index-construction materials-stone, brick, cement, cement-mortar, concrete, steel- their properties and uses.

Unit II - Buildings and their components
Buildings- Various Components and their functions. Soils and their classification Foundations-Functions and types of foundations, Masonry, Floors-functions and types of floors, Roofs and types of roofs.

Unit III - Basic Infrastructure

PART - B Mechanical Engineering

Unit IV - Internal and external combustion systems
Working principles of IC engines – Classification – Diesel and petrol engines: two stroke and four stroke engines. Steam generators(Boilers) – Classification – Constructional features (of only low pressure boilers) – Boiler mountings and accessories.

Conventional Power Generation Systems
Hydraulic, steam and gas turbines power plants – Schemes and layouts – Selection criteria of above power plants.

Unit V - Non-Conventional Energy Systems (Description Only)
Solar thermal systems – Solar photovoltaic – Solar pond – wind, wave, tidal, geothermal and ocean thermal energy conversion systems.

Casting
Green and dry sand moulding processes for ferrous and non-ferrous metals – applications.

Unit VI - Metal Joining
Elements of arc and gas welding, brazing and soldering – Bolted joint types – Adhesive Bonding; classification of adhesives – applications. Sheet Metal Processing Punching, blanking, shearing, bending, and deep drawing processes; descriptions and applications
Text Books

For Part –A

For Part –B

Reference Books
Unit I - Fundamental of Mechanics

Basic Concepts Force System and Equilibrium, Definition of Force, Moment and Couple, Principle of Transmissibility, Varignon’s theorem, Resultant of force system – Concurrent and non concurrent coplanar forces, Condition of static equilibrium for coplanar force system, stability of equilibrium, concept of free body diagrams, applications in solving the problems on static equilibrium of bodies.

Unit II - Plane Trusses

Degrees of freedom, Types of supports and reactions, Types of loads, Analysis of Trusses-method of joints, method of sections.
Friction. Introduction, Static dry friction, simple contact friction problems, ladders, wedges, screws and belt friction.

Unit III - Properties of Surfaces

Properties of sections – area, centroids of lines, areas and volumes, moment of inertia first moment of inertia, second moment of inertia and product moment of inertia, polar moment of inertia, radius of gyration, mass moment of inertia.

Unit IV - Kinematics and Kinetics of Particles


Unit V - Kinematics and Kinetics of Rigid bodies

Plane motion, Absolute motion, Relative motion, translating axes and rotating axes, work and energy, impulse and momentum

Text Books

Reference Books
T112 COMMUNICATIVE ENGLISH

Unit I – Basic Communication Theory
Importance of Communication – stages of communication, modes of communication – barriers to communication – strategies for effective communication – Listening: Importance, types, barriers – Developing effective listening skills.

Unit II – Comprehension And Analysis
Comprehension of technical and non-technical material – Skimming, scanning, inferring-Note making and extension of vocabulary, predicting and responding to context- Intensive Reading and Reviewing

Unit III – Writing
Effective sentences, cohesive writing, clarity and conciseness in writing – Introduction to Technical Writing – Better paragraphs, Definitions, Practice in Summary Writing – Four modes of writing – Use of dictionaries, indices, library references – making bibliographical entries with regard to sources from books, journals, internet etc.

Unit IV – Business Writing / Correspondence

Unit V – Oral Communication

Reference Books
P 104 PHYSICS LABORATORY

List of experiments (Any 10 Experiments)

1. Thermal conductivity – Lee’s DISC
2. Thermal conductivity - Radial flow
3. Spectrometer – Prism or Hollow prism
4. Spectrometer – Transmission grating
5. Spectrometer - Ordinary & Extraordinary rays
6. Newton’s rings
7. Air – wedge
8. Half shade polarimeter – Determination of specific rotatory power
9. Jolly’s experiment – determination of α
10. Magnetism: i – h curve
11. Field along the axis of coil carrying current
12. Vibration magnetometer – calculation of magnetic moment & pole strength
13. Laser experiment: wavelength determination using transmission grating, reflection grating (vernier calipers) & particle size determination
14. Determination of optical absorption coefficient of materials using laser
15. Determination of numerical aperture of an optical fiber

P105 CHEMISTRY LABORATORY

List of experiments (Any 10 Experiments)

1. Determination of dissolved oxygen in water.
2. Determination of total hardness of water by EDTA method.
3. Determination of carbonate and bicarbonate in water.
4. Estimation of chloride content in water.
5. Estimation of magnesium by EDTA.
7. Estimation of ferrous by permanganometry.
8. Estimation of ferrous and ferric iron in a solution mixture by dichrometry.
10. Estimation of copper in copper sulphate solution.
11. Estimation of calcium by permanganometry.
12. Estimation of iron by colorimetry.

Demonstration Experiments( Any two of the following )

1. Determination of COD of water sample.
2. Determination of lead by conductometry.
3. Percentage composition of sugar solution by viscometry.
P 106  WORKSHOP PRACTICE

<table>
<thead>
<tr>
<th>Sl.No.</th>
<th>Trade</th>
<th>List of Exercises</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Fitting</td>
<td>Study of tools and Machineries. Exercises on symmetric joints and joints with acute angle.</td>
</tr>
<tr>
<td>2.</td>
<td>Welding</td>
<td>Study of arc and gas welding equipment and tools – Edge preparation – Exercises on lap joint and V Butt joints – Demonstration of gas welding</td>
</tr>
<tr>
<td>4.</td>
<td>Carpentry</td>
<td>Study of tools and Machineries – Exercises on Lap joints and Mortise joints</td>
</tr>
</tbody>
</table>

List of Exercises

I Fitting

1. Study of tools and Machineries
2. Symmetric fitting
3. Acute angle fitting

II Welding

1. Study of arc and gas welding equipment and tools
2. Simple lap welding (Arc)
3. Single V butt welding (Arc)

III Sheet metal work

1. Study of tools and machineries
2. Funnel
3. Waste collection tray

IV Carpentry

1. Study of tools and machineries
2. Half lap joint
3. Corner mortise joint.
NCC/NSS training is compulsory for all Undergraduate students

1. The activities will include Practical/field activities/Extension lectures.
2. The activities shall be carried out outside class hours.
3. For the above activities, the student participation shall be for a minimum period of 45 hours.
4. The activities will be monitored by the respective faculty in charge and the First Year Coordinator.
5. Pass/Fail will be determined on the basis of participation, attendance, performance and behavior. If a candidate Fails, he/she has to repeat the course in the subsequent years.
6. Pass in this course is mandatory for the award of degree.
Unit I – Laplace Transform
Definitions - Laplace transform of unit impulse and step functions - Laplace transform of periodic functions - Exponential shift formula- Initial and final value theorems - Laplace transform of derivatives and integrals - Convolution theorem - Inverse Laplace transform - Methods of determining inverse Laplace transform - Solution of linear differential equations using Laplace transforms. (12 Hours)

Unit II – Function Of A Complex Variable
Functions of a complex variable - continuity, derivative and analytic function - Cauchy - Riemann equations – Necessary and sufficient conditions for analyticity - Harmonic and orthogonal properties of real and imaginary parts - Conformal mapping - Bilinear transformations. (12 Hours)

Unit III – Complex Integration
Cauchy’s theorem - Cauchy’s integral formula - Taylor’s and Laurent series - Residue theorem - Contour integration round the unit circle and semi-circular contour. (12 Hours)

Unit IV – Fourier Series
Dirichlet’s conditions - Expansion of periodic functions into Fourier series- Change of interval-Half-range Fourier series.
Complex form of Fourier series - Root mean square value - Parseval’s theorem on Fourier coefficients - Harmonic analysis. (10 Hours)

Unit V - Fourier Transform
Fourier Integral (statement only), Fourier transform, Inverse Fourier transform - Fourier sine and cosine transforms, definitions and properties. (12 Hours)

Text Books

Reference Books
Unit I – Diode and Its Applications
Diode equivalent circuits – diode as a switch – applications – Half wave and full wave rectifiers – 
Filters – Ripple factor and rectification efficiency – Clippers and clamping – Voltage doubler and 
trippler – Voltage regulation – Series and shunt voltage regulators.

Unit II – Small Signal Amplifiers
BJT – Transistor biasing and bias circuits – operating point – transistor modelling – ‘h’ parameters 
Analysis of low frequency transistor amplifier circuits for CE – CB and CC configuration – FET 
biasing and bias circuits – FET small signal model – Analysis of common drain and common 
source amplifier configuration.

Unit III – Large Signal Amplifiers
Amplifier types – Class A amplifier – Series fed and transformer coupled – Class B and Class AB 
amplifiers – Conversion efficiency – Amplifier distortion – Class C amplifier.

Unit IV
Feedback Amplifiers: Feedback concept, general characteristics of negative feedback amplifiers, 
Types of feedback, comparison of parameters.
Oscillators: Barkhausen Criterion – Hartley, Colpitts and Wein bridge oscillators, crystal oscillator - 
Frequency stability.

Unit V
Operational Amplifier: Introduction to op-amp, Characteristics of op-amp. Differential and 
common mode operation, op-amp parameters - Equivalent circuit - Applications: Inverting and 
non-inverting amplifier, summer, subtractor, differentiator, integrator, comparator, analog 
multipliers, first order low pass and high pass active filters, regulators using op-amp.

Text Books
1. Jacob Millman and C. Halkias, Satyabrata Jit, Electronic Devices and circuits, Second 

Reference Books
1. Robert L. Boylestad and Louis Neshelsky, Electronic devices and circuit theory, Prentice - 
Hall India, 2008.
Unit I

Introduction: Characteristics of programming Languages, Factors influencing the evolution of programming language, Development in programming methodologies, desirable features and design issues.

Programming Language processors: Structure and operations of translators, software simulated computer, syntax, semantics, structure, virtual computers, binding and binding time.

Unit II

Elementary and structured data type: Data object variables, constants, data types, elementary data types, declaration, assignments and initialization, enumeration, characters string.

Structured data type and objects: Specifications of data structured types, vectors and arrays, variable size data structure, pointers and programmer constructed data structure, Set files.

Imperative Languages: Block structure, Scope rules, Parameter Passing, Construct like co-routines, Tasks etc.

Unit III

Object Oriented Languages: The class notion- Information hiding and data abstraction using classes, derived classes and inheritance, Polymorphism, Parameterized types.

Unit IV

Functional Language: Functional programming concepts – Referential transparency, Types, Type systems, Name, bindings, environment and scope, Recursive functions, Polymorphic functions, Type variables, High order functions, Curried functions, Lists and programming with lists, Definition of new user defined types in ML, Abstract data types, Evaluation methods.

Unit V

Logic Languages: Review of predicate logic, Clause form, logic, Logic as a programming language, Unification algorithm, Abstract interpreter for logic programs, Theory of logic programs, SLD resolution, Negation as failure extension.
Text Books

1. Terrence W. Pratt, Marvin V. Zelkowitz, Programming Languages: Design and Implementation, Prentice Hall, 2000

Reference Books

IT T34 DIGITAL SYSTEM DESIGN

Unit I – Number Systems and Boolean Algebra
Revision of RTL, DTL, ÊL, TTL, ECL, MOS, CMOS logic families-Binary number systems and conversion-Binary arithmetic-Binary codes-Boolean algebra-Basic operations-Basic Theorems-Boolean functions-Canonical forms-Simplification of Boolean functions-Karnaugh maps-Tabulation method.

Unit II – Combinational Logic

Unit III – Sequential Logic I

UNIT IV - Sequential Logic II

UNIT V -Introduction to Verilog Hardware Description Language

Text Book

Reference Books
Unit I - Basics
Primitive And Abstract Data Types: Data types – abstract data type – data structures – classification.

Unit II – Lists
Array implementation – linked list – doubly linked list – circular linked list – multi linked lists – applications of linked lists – representation of polynomials and sparse matrices.

Unit III - Stacks and Queues
Stack ADT – array and linked implementation of stacks – queue ADT – array and linked list implementation of queues – application of stacks and queues – expression evaluation - priority queues – double ended queues

Unit IV - Non-Linear Data Structures

Unit V - Advanced Search Techniques

Text Books:

Reference Books:
Unit I - Basic Computer Organization and Design

Unit II
Micro programmed Control: Control Memory-Address sequencing- Micro program Example – Design of control unit.

Unit III - Memory Organization
Memory hierarchy – main memory – auxiliary memory –Associate memory – Cache memory – Virtual memory.

Unit IV - Input-Output Organization

Unit V - Parallel Processing

Text Books

Reference Books:
1. VI characteristics of semiconductor diodes
2. Diode clipping and clamping circuits
3. Characteristics of CB transistor configuration
4. Input and Output characteristics of CE transistor configuration
5. Characteristics of FET
   Determination of drain resistance, mutual conductance and amplification factor
6. Feedback amplifier
   To determine the frequency response with and without feedback
7. Hartley oscillator and Wein-bridge oscillator
8. Class B push-pull power amplifier
9. Applications of OP-Amps
   Adder, Subtractor, Integrator and differentiator
10. Active low pass and high pass filters using OP-AMP
1. Implementation of logic circuits using gates
   . Full adder/full subtractor
   . Implementation of logic functions using universal gates only
   . Code converters
   . Parity generator and Checker
   . Design of priority encoder
   . Implementation of Boolean functions using MUX
   . Design of decoder, Demultiplexer.

2. Implementation of circuits using MSI
   . Synchronous counters
   . Asynchronous counters
   . Binary multiplier
   . Decimal Adder
   . Universal shift register
   . Design of Arithmetic unit

3. Interface experiments with MSI
   . Design of ALU
   . Interface of ALU with memory

4. Design and Implementation of combinational circuits using Verilog Hardware Description Language (VHDL)

   Combinational circuits – Adder/ Subtractor, Binary multiplier
   Sequential circuits – Flip flops, counters.
1. Implementation of Sorting techniques
2. Implementation of Searching techniques
3. Implementation of stack and queue operations using linked list and array.
4. Expression evaluation
5. Polynomial addition
6. Sparse matrix addition
7. Binary tree representation and traversal techniques
8. Binary search trees
9. Graph representation and traversal techniques
10. Single source shortest path algorithm
11. Hashing and collision resolution techniques
12. AVL Trees
MA T41 DISCRETE MATHEMATICS AND GRAPH THEORY

Unit I
Connectives, Statement formulae, Equivalence of Statement formulae, Functionally complete set of connectives-NAND and NOR connectives, implication, Principal conjunctive and disjunctive normal forms

Unit II
Inference calculus-Derivation process-Conditional proof-Indirect method of proof- Automatic theorem proving-Predicate calculus

Unit III
Partial ordering-Lattices-Properties-Lattices as algebraic system-sub lattices-Direct product and homomorphism-Special lattices-Complemented and Distributive lattices

Unit IV
Graphs-Applications of graphs-degree-pendant and isolated vertices-isomorphism-sub graphs-walks-paths and circuits- connected graphs –Euler graphs-operations on graphs- More on Euler graphs –Hamilton paths and circuits-complete graph

Unit V
Trees-properties of Trees-Pendant vertices in a Tree-Distance and Center in a Tree-rooted and binary trees-spanning trees-Fundamental Circuits-Distance between spanning trees shortest spanning trees-Kruskal algorithm

Text Books


Reference Books


Unit I - Amplitude Modulation Systems

Unit II - Angle Modulation System

Unit III -Transmitters and Receivers

Unit IV - Pulse and Digital Modulation Systems

Unit V - Antennas (Qualitative analysis)
Basic antenna operation, Definition of antenna parameters -radiation pattern, radiation resistance, directive and power gain, directivity, beam width, polarization and bandwidth- UHF and microwave antenna types- Dipole antenna, horn and its types, parabolic reflector, micro strip antenna, Yagi Uda and array antenna.

Text Books

Reference Books
Unit I - Introduction To Microprocessors
Concept and need for microprocessors – evolution - general architecture - control unit – internal registers – arithmetic and logic unit – state transition – architecture of 8085 and 8086 – timing and sequencing.

Unit II - Instruction Set And Programming

Unit III -Interrupts And DMA

Unit IV - Memory & I/O Interfacing

Unit V - Serial Communication And Microprocessor Applications

Text Books

Reference Books
Unit – I
Introduction: Efficiency of algorithms – average and worst case asymptotic notation – the order of - other asymptotic notations.

Unit – II

Unit – III

Unit – IV
Backtracking: n queen’s problem – sum of subsets – graph coloring – Hamiltonian cycle – knapsack problem

Unit – V
Branch And Bound: Knapsack problem – traveling salesman problem – assignment problem
Introduction To NP Completeness: easy vs hard – the class NP – NP complete problems

Text Books

Reference Books
Unit I

Unit II
Threads -- Overview -- Threading issues - CPU Scheduling -- Basic Concepts -- Scheduling Criteria -- Scheduling Algorithms -- Multiple-Processor Scheduling -- Real Time Scheduling - The Critical-Section Problem -- Synchronization Hardware -- Semaphores -- Classic problems of Synchronization -- Critical regions -- Monitors.

Unit III

Unit IV

Unit V

Text Books

Reference Books
Unit I
Limitations in structured programming-Characteristics of Object Oriented Language – data types-
Classes – Objects- Operator overloading – Inheritance.

UNIT II
Polymorphism – I/O operations-Files-Templates – Exception Handling – Container Classes-
Strings.

Unit III
Object Orientation – System development – Review of objects - inheritance - Object relationship –
Implementation – Testing- Overview of Methodologies.

Unit IV
OMT – Booch methodology, Jacobson methodology – patterns – Unified approach –UML – Class
diagram – Dynamic modeling. Use case model – Creation of classes –Noun phrase approach –
responsibilities – Collaborators – Object relationships – Super-Sub class – Aggregation.

Unit V
OO Design axioms – Class visibility – refining attributes – Methods –Access layer –OODBMS –
Table – class mapping view layer. Quality assurance testing – Inheritance and testing – Test plan –
Usability testing – User satisfaction – Testing.

Note: Unit I & II deals with C++

Text Books

References
Wesley, 2000
2. Simon Benett, Steve McRobb, Ray Farmer, Object Oriented System Analysis and Design
3. Timothy C. Lethbridge, Robert Laganiere, Object Oriented Software Engineering
5. Richard C Lee, William M Tepfenhart, UML and C++ - A practical guide to object oriented
development, PHI, 1997.
1. Programs using C++ concepts like
   - classes & objects
   - Constructors & Destructors
   - Function Overloading
   - Inheritance
   - Operator overloading
   - Polymorphism & virtual functions
   - I/O streams
   - File operations.
   - Templates
   - Exception handling (to be included in all problems)
   - String operations

2. Quick sort using divide and conquer
3. Merge sort using divide and conquer
4. Prim’s algorithm
5. Kruskal’s algorithm
6. Dijkstra’s algorithm
7. Optimal binary search tree
8. TSP using dynamic programming.
10. Sum of subsets using backtracking.
11. Graph coloring using backtracking.
IT P42 MICROPROCESSOR LAB

1. Study of 8085 Microprocessor trainer kit
2. Assembly language programming: arithmetic operations
3. Assembly language programming: block operations
4. Assembly language programming: code conversions
5. Assembly language programming: sorting and searching methods
6. Digital clock simulation
7. Printer interfacing
8. Serial communication within a trainer kit
9. Serial communication between kit to kit
10. Elevator simulation
11. Traffic light control
12. Music synthesizer
13. ADC & DAC interfacing
14. Stepper motor and DC motor interfacing
15. 8086 assembly language programming using MASM
1. Study of basic Unix / Linux commands.
2. Shell Programming.
3. Programs using the following system calls of Unix / Linux operating system:
   - fork, exec, getpid, exit, wait, close, stat, opendir, readdir
4. Programs using the I/O system calls of UNIX operating system (open, read, write, etc).
5. Simulations of Unix / Linux commands like ls, grep, etc.
6. Simulation of scheduling algorithms (CPU and Disk).
8. Simulation of basic memory management schemes.
10. Simulation of file systems.
Physical Education is compulsory for all the Undergraduate students

1. The above activities will include games and sports / extension lectures.
2. In the above activities, the student participation shall be for a minimum period of 45 hours.
3. The above activities will be monitored by the Director of Physical Education.
4. Pass /Fail will be determined on the basis of participation, attendance, performance and behavior. If a candidate Fails, he/she has to repeat the course in the subsequent years
5. Pass in this course is mandatory for the award of degree.
UNIT I – Microwave communication systems
Introduction to microwave components, wireless channel characteristics, Microwave communication systems: advantage, block diagram of a microwave radio system, microwave radio stations- Terminal station and repeater station.

UNIT II - Satellite Communication systems
Satellite Orbits, launch vehicles, look angles, satellite parameters, satellite link model and link budget calculations, satellite used for mobile networks and personal communication systems- GPS services.

UNIT- III – Spread Spectrum Communication
Spread spectrum technologies - spreading techniques - PN sequences - Direct sequence spread spectrum systems - Frequency hopping spread spectrum systems - Hybrid systems - Demodulation schemes - RAKE receivers - Use of spread spectrum with code division multiple access

UNIT IV – Cellular Mobile Communication
Cellular concept, basic cellular concept and its operation, uniqueness of mobile radio environment- Performance metrics in cellular system-Elements of cellular mobile radio-Handoff- Frequency management and channel assignment- Introduction to various cellular standards like AMPS, GSM, GPRS, IS-95A, IS-95B, CDMA-2000 and WCDMA.

UNIT V – Fiber Optical Communication Systems
Need for fiber optics, introduction to optical fiber, principle of light transmission through a fiber, fiber characteristics and classification, various fiber losses- Light sources and photo detectors- Block diagram of a fiber optic system- Power budget analysis for a optical link-Recent applications of fiber optics.

Text Books

Reference Books
Unit I
Introduction: The evolving role of Software – Software characteristics, Software Process: Software process models - The linear sequential model - The prototyping model - The RAD model - Evolutionary software process models - The incremental model - The spiral model - Software applications - Software myths.

Unit II

Unit III
Object-Oriented analysis and design

Unit IV
Testing Techniques: Software testing fundamentals - Test case design - White box testing - Basis path testing - Control structure testing - Black box testing - Testing for specialized environments, Testing strategies - Verification and validation - Unit testing - Integration testing - Validation testing - The art of debugging.

Unit V
Implementation and Integration: Implementation Phase – Integration Phase - System testing – Maintenance Phase.
Text Books


Reference Books

IT T53 AUTOMATA LANGUAGES AND COMPUTATION

Unit I
Finite Automata and Regular Expressions: Deterministic and Non-Deterministic Finite Automata, Finite Automata with $\varepsilon$-moves, regular expressions – equivalence of NFA and DFA, two-way finite automata, Moore and Mealy machines, applications of finite automata.

Unit II

Unit III
Pushdown Automata and Parsing Algorithms: Pushdown Automata and context-free languages; Top-down parsing and Bottom-up parsing; properties of CFL; Applications of pumping lemma, closure properties of CFL and decision algorithms.

Unit IV
Turing machines: Turing machines(TM) – computable languages and functions – tuning machine constructions – storage in finite control – variations of TMs – recursive and recursive enumerable languages.

Unit V
Introduction to Computational Complexity: Time and Space complexity of TMs – complexity classes – introduction to NP-Hardness and NP-Completeness.

Text Book

Reference Books
UNIT I


UNIT II


UNIT III


UNIT IV


UNIT V


TEXT BOOKS


REFERENCES


Unit I - Introduction to System Software and Machine Structure

Unit II
Interpreters: Virtual Machine concept- Java Byte Codes- Microsoft Intermediate Language

Unit III - Loaders and Linkers

Unit IV - Compilers
Structure- Lexical Analyzers- Designing lexical analyzers-Syntactic specification of programming languages- Parsing Techniques-SLR.

Unit V
Intermediate code generation- Parse trees-Three address codes-quadruple and triples- Code optimization –principal sources-loop optimization-DAG representation of basic blocks.

Text Books

Reference Book
UNIT I

UNIT II

UNIT III

UNIT IV
Error Control Coding: Linear Block Codes for Error Correction - Cyclic Codes - Bose-Choudhuri Hocquenghem codes - Convolution Codes - Trellis Coded Modulation.

UNIT V
Cryptography: Overview of encryption techniques - symmetric cryptography - Data Encryption Standard (DES) - International Data Encryption Algorithm (IDEA) - RC Ciphers - Public-key algorithm - RSA algorithm - Pretty Good Privacy - One-way Hashing.

TEXT BOOKS

REFERENCE BOOKS
1. Amplitude modulation and demodulation
2. Frequency modulation and demodulation
3. PCM encoder and decoder
4. Generation of PAM, PWM and PPM
5. Generation of ASK, FSK and PSK
6. Simulation analysis of handoff performance in cellular mobile systems
7. Simulation of satellite link budget analysis
8. Simulation of fiber optic link budget analysis
9. Simulation of various propagation models (Outdoor and Indoor)
10. Simulation of antenna radiation pattern (Horn, Parabolic reflector)
VISUAL BASIC

1. Simple programs with control structures using form and intrinsic controls
2. Adding menus to forms
3. Creating dialog boxes with various options
4. MDI applications
5. Writing code for various keyboard and mouse events
6. OLE container control
7. Simple programs with classes and objects
8. Data access through Data control and DAO.

VISUAL C++

1. creating applications with App wizard
2. Simple Winconsole application.
3. Working with MFC
4. Creating simple SDI and MDI applications
5. Exception handling (to be considered in all programs)
6. Loading - Editing - Adding resources - Linking resources to applications
7. Threads
8. OLE
9. ODBC
10. DLL's
IT P53 JAVA AND INTERNET PROGRAMMING LAB

1. Write programs in Java to demonstrate the use of following components: Text fields, buttons, Scrollbar, Choice, List and Check box.

2. Write Java programs to demonstrate the use of various Layouts like Flow Layout, Border Layout, Grid layout, Grid bag layout and card layout.

3. Write programs in Java to create applets incorporating the following features:
   - Create a color palette with a matrix of buttons.
   - Set background and foreground of the control text area by selecting a color from color palette.
   - In order to select foreground or background use check box control as radio buttons.
   - To set background images.

4. Write a java program to simulate a scientific calculator.

5. Develop a simple real-life application program to illustrate the use of Multi Threads.

6. Write a java program to create simple chat application with Datagram Sockets and Datagram Packets.

7. Write programs in Java using Servlets:
   - To invoke servlets from HTML forms.
   - To invoke servlets from Applets.

8. Write programs in Java to create three-tier applications using servlets:
   - for conducting on-line examination.
   - for displaying student mark list. Assume that student information is available in a database which has been stored in a database server.

9. Create a web page with the following using HTML:
   i) To embed a map in a web page.
   ii) To fix the hot spots in that map.
   iii) Show all the related information when the hot spots are clicked.

10. Create a web page with the following:
    i) Cascading style sheets.
    ii) Embedded style sheets.
    iii) Inline style sheets.
    iv) Use our college information for the web pages.
Unit I - Art Of Communication

Verbal and Non-verbal Communication – Barriers to Communication – Importance of Body Language – Effective Listening – Feedback

Unit II - Introduction to Soft Skills


Unit III - Writing

Importance of Writing – Written Vs Spoken Language – Formal and Informal Styles of writing – Resources for improving writing – Grammar and Usage – Vocabulary Building – SWOT analysis

Unit IV - Speaking Practice


Unit V - Aptitude

Verbal and Numerical aptitude

Reference Books

UNIT I -Introduction

UNIT II-Security Analysis And Logical Design

UNIT III -Physical Design
Security Technology – Intruders, Malicious software, Firewalls, Scanning and Analysis tools, Content filters.

UNIT IV-Cryptography
Advanced Encryption standard, Principles of public-key cryptosystem, Key management, Message authentication and Hash functions, Digital signatures.

UNIT-V- Biometric Security
Biometrics: Definition-Types of Biometrics- Multi biometrics-Fusion methods-applications.

TEXT BOOKS

REFERENCES
UNIT- I

UNIT -II
Knowledge Representation: Approaches and issues in knowledge representation- Knowledge-Based Agent- Propositional Logic –Predicate logic-Unification- Resolution- Weak slot-filler structure – Strong slot-filler structure.

UNIT -III

UNIT -IV
Planning and Learning: Planning with state space search-conditional planning-continous planning-Multi-Agent planning. Forms of learning-inductive learning-learning decision trees-Neural Net learning and Genetic learning

UNIT -V
Advanced Topics: Game Playing: Minimax search procedure-Adding alpha-beta cutoffs
Robotics: Hardware-Robotic Perception-Planning-Application domains

Text Books

Reference Books
Unit I - Introduction

Unit II - Relational Model

Unit III - Integrity and Security

Unit IV - Storage and File Structures

Unit V - Transactions

Text Book

Reference Books
UNIT I - Introduction


UNIT II - Data Link Layer


UNIT III - NETWORK LAYER

Network Layer design issues – Routing algorithms – Congestion- Control algorithms – Internetworking – Network Layer in Internet.

UNIT IV - TRANSPORT LAYER


UNIT V - APPLICATION LAYER


Text Books


Reference Books

1. Study of Database Concepts

2. Study of SQL
Primitive Data Types – User Defined data Types – Built-in Functions – Parts of Speech of CREATE, ALTER, DROP, SELECT, INSERT, DELETE, UPDATE, COMMIT, ROLLBACK, SAVEPOINT, GRANT, REVOKE

3. Study of Query Types
Queries involving Union, Intersection, Difference, Cartesian Product, Divide Operations – Sub Queries – Join Queries – Nested Queries – Correlated Queries – Recursive Queries

4. Study of PL/SQL
Blocks, Exception Handling, Functions, Procedures, Cursors, Triggers, Packages.

5. Application
Design and develop any two of the following
- Library Information System
- Logistics Management System
- Students’ Information System
- Ticket Reservation System
- Hotel Management System
- Hospital Management System
- Inventory Control
- Retail Shop Management
- Employee Information System
- Payroll System
- Any other Similar System
Clearly mention the scope of the system. Use standard tools for expressing the design of the systems.
IT P62 MINI PROJECT

Students in convenient groups of not more than three members in a group are to take up sample project development activities with the guidelines given below using some of the Computer Aided Software Engineering Tools (CASE):

- Preparing a project – brief proposal including
  - Problem Identification
  - Developing a model for solving the problem
  - A statement of system / process specifications proposed to be developed (Data Flow Diagram)
  - List of possible solutions including alternatives and constraints
  - Cost benefit analysis
  - Time line activities

- A report highlighting the design finalization [based on functional requirements & standards (if any)]

- A presentation including the following
  - Implementation phase (Hardware / Software / both)
  - Testing & Validation of the developed system
  - Learning in the project

- Consolidated report preparation
1. Write a socket Program for Echo/Ping/Talk commands.
2. Create a socket (TCP) between two computers and enable file transfer between them.
3. Write a program to implement Remote Command Execution (Two M/Cs may be used).
4. Write a program to implement CRC and Hamming code for error handling.
5. Write a code simulating Sliding Window Protocols.
6. Create a socket for HTTP for web page upload & Download.
7. Write a program for TCP module Implementation (TCP services).
8. Write a program for File Transfer in client-server architecture using following methods.
   a. Using RS232C
   b. TCP/IP
9. Write a program to implement RMI (Remote Method Invocation).
10. Perform a case study about the different routing algorithms to select the network path with its optimum and economical during data transfer.
    a. Shortest path routing
    b. Flooding
    c. Link State
    d. Hierarchical
11. Broadcast / Multicast routing.
HS P64 GENERAL PROFICIENCY – II

Unit I - Composition Analysis
Technical and Non-Technical Passages (GRE Based) – Differences in American and British English – Analyzing Contemporary issues – Expanding Terminology

Unit II - Writing
Job Application Letter Writing – Resume Writing

Unit III - Oral Skills
Group Discussion – Introduction and Practice – Team Work – Negotiation Skills – Organizing and Attending Meetings – Facing Interviews

Unit IV - Adapting To Corporate Life
Corporate Etiquette – Grooming and Dressing

Unit V - Aptitude
Verbal and numerical aptitude

Reference Books
UNIT-I

UNIT-II

UNIT-III

UNIT-IV
Quality of Multimedia Data Transmission–Multimedia Over IP–Multimedia over ATM Networks–Multimedia on Demand– Multimedia over Wireless Networks.

UNIT-V

Text Books :


Reference Books :

Unit I - Introduction To Embedded Systems
Definition and Classification – Overview of Processors and hardware units in an embedded system – Software embedded into the system – Exemplary Embedded Systems – Embedded Systems on a Chip (Soc) and the use of VLSI designed circuits

Unit II - Devices And Buses For Devices Network

Unit III - Programming And Interfacing 8051
8051 Micro controller-architecture-memory organization- special function registers- timing and control- port operation- interrupts.
Programming 8051- operand types- operand addressing-data transfer instructions- arithmetic and logical instructions- control transfer instructions-
Interfacing 8051- programming 8051 resources- timers/ counters- Serial interface – Multi processor communication – measurement of frequency, period and pulse width of a signal-memory interfacing – I/O interfacing

Unit IV - Real Time Operating Systems – Part - 1
Comparison of process, task and thread – characteristics of ISRs and Tasks – OS services – goals – structures – kernel – process management – memory management – device management – file system organization and implementation – I/O systems – Interrupt routines-handling in RTOS-

Unit V - Real Time Operating Systems – Part - 2
Study of Micro C/OS-II or Vx Works or Any other popular RTOS – RTOS System Level Functions – Task Service Functions – Time Delay Functions – Memory Allocation Related Functions – Semaphore Related Functions – Mailbox Related Functions – Queue Related Functions – Case Studies of Programming with RTOS – Understanding Case Definition – Multiple Tasks and their functions – Creating a list of tasks – Functions and IPCs – Exemplary Coding Steps.
Textbooks

Reference Books
IT T73 COMPONENT TECHNOLOGY

Unit I
Client/server computing- building blocks-types of servers-types of clients- types of middleware-aspects of client/server systems- sizing-scalability- tiered architecture-client/server models-Requirements of client/server systems-Distributed objects-benefits-drawbacks-from distributed objects to components

Unit II
Component technology- components- definitions- properties-benefits-components and interfaces-direct and indirect interfaces- versions- interfaces as contracts-callbacks-forms of design level reuse- connection oriented programming-connectable objects- component architecture- component frameworks- composition- data driven, contextual, aspect oriented programming, subject oriented programming, XML components-component development- assembly.

Unit III
The Microsoft way-component object model- From COM, COM+, DCOM to .NET framework-evolution- web services technologies-XML, WSDL, UDDI, SOAP- Common Language Runtime-.NET framework class library-ADO.NET, ASP.NET

Unit IV
The Sun Way-component variety – applets, servelets, java beans, enterprise beans-EJB architecture- types of beans- characteristics-Building and deploying distributed applications using EJB

Unit V
The OMG way-system object model- CORBA timeline-CORBA architecture-ORB-services-facilities-business objects-IIOP-transport mechanisms- IDL- - CCM- CCM container

Text books

References
IT P71 ADVANCED SOFTWARE LAB

CYCLE I - MULTIMEDIA LAB EXERCISES

1. To implement various Text Compression Algorithms.
2. To implement various Image Compression Algorithms.
3. To perform animation using any Animation Software.
4. To perform basic operations on image using any Image Editing Software.

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CYCLE II - EMBEDDED SYSTEMS LAB

1. Study of 8051 micro controller
2. Simple computational problems
3. Reading and Writing on a parallel port.
4. Timer in different modes.
5. Serial communication implementation
6. Measurement of frequency, amplitude, and pulse width of a signal
7. Keypad and seven segment display Interfacing
8. Interfacing DC motor
9. Interfacing Stepper motor
10. Interfacing ADC
11. I^2C programming
IT P72 COMPONENT TECHNOLOGY LAB

The students have to develop distributed applications for a given domain using the following technologies:

1. RMI using JDBC
2. CORBA
3. COM
4. DCOM
5. ASP.NET/C#. NET
6. SERVLETS
7. EJB
8. MESSAGE BEANS
9. An interoperable application involving either language/ network protocol heterogeneity or involving any two of the above technologies.
10. Application development using ASP, PHP, JSP
IT P73 PROJECT WORK (PHASE-I)

The objective of the project is to enable the students to work in convenient groups of not more than three members in a group on a project of latest topic / research area / industrial applications. Each project group shall have a guide who is a faculty member.

During the seventh semester, the students are expected to undergo Phase-I of the project. The project group is required to do literature survey, formulate the problem and form a methodology of arriving at the solution of the problem. The departmental committee shall examine the students for 100 marks and the evaluation is based on continuous internal assessment comprising one seminar (30 marks), demo (30 marks) and one internal viva-voce (40 marks).

IT P74 SEMINAR

The objective of the seminar is to encourage the students to work independently and to get exposure in latest technologies. The topic shall be chosen in consultation with a faculty member who would be the guide. Each student is expected to make a critical review of literature and prepare a report. The student is expected to present a seminar. The departmental committee will evaluate the performance of the students in the seminar and the report for 100 marks.

IT P75 INDUSTRIAL TRAINING / VISIT

In the course of study, during 5th and 6th semesters, each student is expected to undertake a minimum of four industrial visits (leading hardware manufacturing / software development concerns) or undertake a minimum of two weeks / 15 days of industry training(in a reputed concern). Based on the industrial visits / training, the student has to submit a report at the end of sixth semester highlighting the exposure he/she gained. The report will be evaluated by the departmental committee for 100 marks. The proofs for having undergone visits / training are to be enclosed along with report as enclosures.
IT T81 SERVICE ORIENTED ARCHITECTURE

Unit – I
SOA and Web Services Fundamentals: Fundamental SOA- Common characteristics of Contemporary SOA – Common misperceptions about SOA- Common tangible benefits of SOA- Common pitfalls of adopting SOA.

Evolution of SOA: An SOA Timeline- Continuing evolution of SOA - The roots of SOA.

Unit – II

Unit – III


Unit IV

Unit V

Text Book

Reference Books:
UNIT-I
Introduction:- Characteristics, Examples, Applications, Challenges – System models:- Architectural models and Fundamental models – Network principles and Internet protocols – Interprocess communication: API, Marshalling, Client-server communication, Group communication,
UNIT-II
Distributed objects and Remote Invocation:- Introduction, Communication between distributed objects, Remote Procedure Call, Events and Notification – Operating System Support:- Introduction, OS Layer, Protection, Processes and Threads, Communication and invocation, Operating system architecture
UNIT-III
Distributed File System:- File service architecture, Sun network and Andrew File system, Recent advances – Name Services:- Domain Name System, Directory and discovery services, Case study for Global name service and Directory service – Time and Global States:- Clocks, events and processes, Clock synchronization, Logical clocks, Global states, Distributed debugging – Coordination and Agreement
UNIT- IV
Transaction and Concurrency Control:- Transactions and nested transactions, Locks, Optimistic concurrency control, Timestamp ordering, Comparison of concurrency control – Distributed Transactions – Replication - Distributed Shared Memory: Design and implementation issues, Consistency models
UNIT-V
Distributed Multimedia Systems:- Characteristics, Quality of service management, Resource management, Stream adaptation – Web Services:- Introduction, Service descriptions and IDL, Directory service, XML Security, Coordination of web services -Case Study:- CORBA

TEXT BOOK

REFERENCE
IT T83 MANAGEMENT CONCEPTS AND STRATEGIES

Unit-I

Unit-II
Decision making. The Nature and purpose of organizing - Basic departmentation - Line /staff Authority and decentralization - Effective Organizing and organizational culture.

Unit-III
Human Resource Management and selection - Performance appraisal and career strategy - Manager and organizational development.

Unit-IV
Managing and the Human factor - Motivation - Leadership - communication.

Unit-V
The system and Process of controlling control techniques and information Technology - Productivity and Operations Management - Overall and Preventive Control - Towards a unified, Global management theory.

Text Books
HS P81 PROFESSIONAL ETHICS

The course should cover the following topics by way of Seminars, Expert Lectures and Assignments:

1. Engineering Ethics – Moral issues, Ethical theories and their uses
2. Engineering as Experimentation – Code of Ethics
3. Engineer’s responsibility for safety
4. Responsibilities and rights
5. Global issues of engineering ethics

Reference Book

1. Charles D.Fleddermann, Engineering Ethics, Prentice Hall, New Mexico, 1999

IT P82 PROJECT WORK (PHASE-II)

The objective of the project is to enable the students to work in convenient groups of not more than three members in a group on a project of latest topic / research area / industrial applications. Each project group shall have a guide who is a faculty member.

During the eighth semester, the students are expected to complete the project (Phase - II) and submit a full-fledged report comprising of the complete system developed along with implementation and test results. The departmental committee shall examine the students for 50 marks and the evaluation is based on continuous internal assessment comprising one seminar (25 marks) and demo for complete system developed (25 marks). At end of the semester, a viva-voce examination will be conducted for 50 marks (25 marks for internal examiner and 25 marks for external examiner).

IT P83 COMPREHENSIVE VIVA VOCE

The students will be tested for their understanding of subjects of study in the curriculum from 3rd semester to 8th semester. A comprehensive examination, preferably with objective type questions, will be conducted and evaluated the performance of the students for 50 marks. A comprehensive viva voce examination will be conducted for 50 marks with one internal examiner and one external examiner appointed by the University.
Unit I

Unit II

Unit III

Unit IV
Multiple sequence alignment: computational challenges – Dynamic programming solution – approximation algorithms – center star, distance from concensus , sum of pairs progressive alignment , multiple alignment to a phylogenic tree – Tools for Multiple sequence alignment – CLUSTALW.

Unit V
Phylogenetic analysis : Bais Definitions – From MSA to phylogenetics – Phylogentic tree construction methodologies – distance based methods – UPGMA, Neighbour joining – Character based methods – maximum parsimony – fitch algorithm, weighted parsimony – sankoff’s algorithm , maximum likelihood, tools for phylogenetic tree construction PAUP, PHYLIP

Textbooks
UNIT I – Introduction
Need of high speed computing – increase the speed of computers – history of parallel computers and recent parallel computers; solving problems in parallel – temporal parallelism – data parallelism – comparison of temporal and data parallel processing – data parallel processing with specialized processors – inter-task dependency.

UNIT II - Instruction level parallel processing

UNIT III - Structure of Parallel Computers

UNIT IV

UNIT V

Text Books

Reference Books
Unit I - Graphics Systems & Graphical User Interface

Unit II - Display Primitives & Attributes

Unit III - Two Dimensional Transformations & Viewing

Unit IV - Three Dimensional Concepts & Transformations

Unit V - Three Dimensional Viewing

Text Book

Reference Book
IT E64 SOFT COMPUTING

Unit I


Unit II

Types of Neural Networks - Competitive Learning- Kohonen Maps - CPN - ART - Neocognitron Neural Networks  - Neural Networks As Associative Memories: Hopfield and Bidirectional Associative Memory.

Unit III


Unit IV


Unit V


Text Books

UNIT I – Introduction
Advantage of digital over analog signal processing – Discrete time signals and systems - Analysis of discrete time LTI systems - Difference equations. Applications of DSP in speech and image processing - Introduction to biomedical signal processing and communication.

UNIT II - DFT and FFT
Discrete Fourier transform and its properties - Relation between z transform, Discrete Time Fourier transform (DTFT) and DFT- Frequency analysis of signal using DFT- FFT algorithms - Advantages over discrete computation of DFT - radix2 algorithms - Decimation in time Decimation in frequency-Computation of IDFT using FFT.

UNIT III - Implementation of Discrete Time Systems

UNIT IV - Design of Digital Filters

UNIT V - Power Spectrum Estimation
Computation of energy density spectrum-the period gramuse of DFT in power spectrum estimation-non parametric methods-Bartlett & Welch method-parametric methods-AR, MA and ARMA models.

Text Books

Reference Books
Unit I - PC Hardware Overview

Unit II - Bus Standards and Networking

Unit III - Peripheral Devices & Display Adapters

Unit IV - Mass Storage Devices

Unit V - Troubleshooting & Tools
In-Circuit Emulators – Logic State/Timing Analysers – Digital Multimeters – CROs – Signature Analysers – Troubleshooting problems of system boards, add on cards and peripherals.

Text Books

Reference Books
Unit I

Unit II

Unit III

Unit IV

Unit V

Text Books
Unit I
Software testing -The Role process in Software Quality- Testing as a process- Overview of testing maturity model, software testing definition- Software Testing Principles – Origin of defects, Defect classes, the defect Repository and Test Design

Unit II
Testing Strategies: Testing design strategies, Test case design strategies, Black box testing, Random Testing, Equivalence partitioning, Boundary value analysis, Cause-and-Effect, State transition, Error Guessing, COTS, White box testing techniques - Statement coverage - Branch Coverage - Condition coverage - Decision/Condition coverage - Multiple condition coverage - Dataflow coverage - Mutation testing

Unit III

Unit IV
Testing Object Oriented Software: Unit Testing in OO Context, Integration Testing in OO Context, OO testing methods, Class level testing, Interclass test case design, testing for real time system

Unit V
Controlling and Monitoring: Measurements and Milestone for Controlling and Monitoring: Status, Productivity, Cost, Error, fault and Failures, Effectiveness, Criteria for Test Completion, Reviews as testing Activity: Inspection Walkthrough, Components of review plan, testing for web application, Component level testing, Clean room tests.

Text Book

Reference Books
IT E71 MATHEMATICAL STATISTICS AND NUMERICAL METHODS

Unit I - Solution of Algebraic Equations and Solution of Linear Simultaneous Equations
The method of Bisection, the method of false position, Newton-Raphson method, Gauss elimination method, Crout’s reduction, Gauss-Seidel Iterative method - Power method for finding the numerically largest Eigen value.

Unit II - Interpolation, Differentiation and Integration
Interpolation by Newton’s forward and backward difference formulae for equal intervals, Lagrange’s interpolation formula for unequal intervals, Differentiation based on finite differences to find first and second order derivatives, Integration by Trapezoidal and Simpson’s 1/3 rule.

Unit III - Reliability
Concept of Reliability, Reliability and Availability of systems, Maintainability, Preventive maintenance

Unit IV - Quality Control
Introduction, Process control, Control charts for variables and attributes (X, R, p, np, c charts only).

Unit V - Queuing Theory
The Birth-Death process (M/M/1/∞, M/M/c/∞, M/M/1/N, M/M/c/N (N>c), M/M/c/c, M/M/∞ models only), M/G/1 model - Pollaczek-Khinchin formula.

Text Books


3. S.P.Gupta, Statistical Methods, Sultan Chand & Sons, New Delhi, 2006 (for Unit IV).

Unit I

Nature, significance and rationale of business process reengineering (BPR) – Fundamentals of BPR – Classification of Reengineering Projects – Role of information technology (IT) and identifying IT levers – BPR phases, Relationship between BPR Process – Typical BPR activities within phases.

Unit II


Unit III


Unit IV


Unit V


Text Books


Reference Books

IT E73 IMAGE PROCESSING

Unit I

Unit II

Unit III

Unit IV

Unit V

Text Books

Reference Book:
UNIT I

UNIT II

UNIT III
ActiveX controls: Introduction- Building a basic control - OLE and ActiveX- HTML and ActiveX-ActiveX Documents.

UNIT IV

UNIT V

TEXT BOOKS

REFERENCE BOOKS
Unit I

Unit II

Unit III
Mobile IP: Goals, Assumptions, requirements, IP packet delivery, Agent advertisement and discovery, registration, Tunnelling and encapsulation, Optimization, Reverse tunnelling, IPv6, Dynamic host configuration protocol – Ad hoc networking: Routing, destination sequence distance vector, dynamic source routing, hierarchical routing, and Alternative metrics.

Unit IV

Unit V

Text Books

Unit I

Unit II

Unit III

Unit IV

Unit V

Text Books

Reference Books
UNIT I


UNIT II


UNIT III


UNIT IV


UNIT V


TEXT BOOKS

3. Mary Shaw and David Garlan, Software Architecture – Perspectives of an Emerging Discipline, PHI, India, 2008. (Unit – II)
IT E78 GIS AND REMOTE SENSING

Unit I

Unit II

Unit III

Unit IV

Unit V

Text Books
UNIT – I

UNIT – II

UNIT – III

UNIT – IV

UNIT – V

TEXT BOOKS

REFERENCES
Unit I

Unit II

Unit III

Unit IV

Unit V

Text Books

Reference Books
Unit I

Unit II

Unit III

Unit IV

Unit V
Cluster analysis: Types of data – Clustering Methods – Partitioning methods – Model based clustering methods – outlier analysis.

Advanced topics: Web Mining – Web Content Mining – Structure and Usage Mining – Spatial Mining – Time Series and Sequence Mining – Graph Mining

Applications : Case studies in Data Mining applications

Text Books
2. Jiawei Han, Micheline Kamber, Data Mining: Concepts and Techniques, Morgan Kaufman Publishers, 2006.

Reference Books
IT E83 NATURAL LANGUAGE PROCESSING

Unit I - Introduction

Unit II - Grammars and Parsing

Unit III - Semantic Interpretation:

Unit IV - Language Communication:

Unit V - Typical Systems:
Text Books:

References:
IT E84 ENTERPRISE RESOURCE PLANNING

Unit I – Introduction to ERP

Integrated Management Information—Seamless Integration – Supply Chain Management –
Integrated Data Model – Benefits of ERP – Business Engineering and ERP – Definition of
Business Engineering – Principle of Business Engineering – Business Engineering with
Information Technology.

Unit II – Business Modeling For ERP

Building the Business Model – ERP Implementation – An Overview – Role of Consultant,
Vendors and Users – Customisation – Precautions – ERP Post Implementation Options–ERP
Implementation Technology – Guidelines for ERP Implementation.

Unit III – ERP and the Competitive Advantage

ERP domain MPGPRO – IFS/Avalon – Industrial and Financial Systems – Baan IV SAP – Market
Dynamics and Dynamic Strategy.

Unit IV – Commercial ERP Package

Description – Multi-Client Server Solution – Open Technology – User Interface– Application
Integration.

Unit V – Architecture

Basic Architectural Concepts – The System Control Interfaces – Services – Presentation Interface
– Database Interface.

Text Books

1. Vinod Kumar Garg and N.K.Venkita Krishnan, Enterprise Resource Planning – Concepts and

Reference Books

Unit I

Unit II
People Management: Organization structure – Difficulties in people management - Effective team building – Role of Project manager - Team structures – Comparison of different team structures.


Unit III


Unit IV

Unit V

Text Books

Reference Books
Unit I - ISDN and Frame Relay


Unit II - Asynchronous Transfer Mode


Unit III - Congestion Control and QOS in IP Networks


Unit IV - WDM Optical Networks

Introduction to Optical Networks – Wavelength Division Multiplexing (WDM) – Introduction to broadcast and select networks – switch architectures – channel accessing – Wavelength routed networks – switch architectures – Routing and wavelength assignment – Virtual topology design – IP over ATM over WDM – IP over WDM.

Unit V - SONET and SDH


Text Books

Reference Books
Unit I
VLSI Circuits and Basic Electrical Properties of MOS and Bi CMOS Circuits: NMOS, CMOS and Bi CMOS fabrication - p well, n well and twin tub process – comparison between CMOS and Bipolar technology – Electrical parameters – pull up to pull down ratio – Device modeling.

Unit II

Unit III

Unit IV
Ultra Fast VLSI Circuits And Programmable ASIC’s: Ultra fast systems – GaAs crystal structure – GaAs fabrication – device modeling and performance estimation (only GaAs) Antifuse and SRAM Practical issues – FPGA economics, programmable logic cells, Actel ACT1, ACT2 and ACT3 – Xilinx LCA, Ultra FLEX and Ultra MAX.

Unit V
An Introduction to HDL, Verilog And VHDL: Verilog: Basics of Verilog, operators, hierarchy procedures and assignments, timing controls and delays, tasks and functions, control statements. VHDL: Syntax and semantics, identifiers and literals, entities and architectures, packages and libraries interface, type and other declarations, sequential statements, operators, arithmetic operators, VHDL and logic synthesis, Verilog and logic synthesis.

Text Books

Reference Books
4. Amar Mukherjee, Intoduction to NMOS and CMOS VLSI system design, PHI, 1986.
IT E88 C# AND .NET FRAMEWORK

Unit I

Unit II
Introduction to C# - Data Type – Operators – Flow Control and Iteration – Arrays and Strings – Basics of C# Classes – Boxing and Unboxing – Reflection – Interoperability – The Preprocessors – Attributes – Name Spaces.

Unit III

Unit IV
Implementing the IC1oneable and IComparable Interfaces – Introduction to .NET Collections (including Custom Collections) – Custom Indexers, Delegates and Events – Multithreading and Synchronization – Type Reflection and Attributes – Programming the Windows Registry.

Unit V

Text Books

Reference Books
UNIT I


UNIT II

The Open Grid Services Architecture: Introduction -An Analogy for OGSA - The Evolution to OGSA -OGSA Overview -Building on the OGSA Platform -Implementing OGSA-Based Grids - Conclusion - Creating and Managing Grid Services -Introduction -Services and the Grid - Converting Existing Software -Service Discovery - Operational Requirements - Tools and Toolkits -Support in UDDI - UDDI and OGSA - UDDi: UDDI Extensions and Implementation - Uses - Quality of Service Management -Conclusion

UNIT III


UNIT IV


UNIT V


TEXTBOOK

REFERENCES