ACADEMIC REGULATIONS  
COURSE STRUCTURE  
AND  
DETAILED SYLLABUS  

ELECTRONICS AND  
TELEMATICS  
ENGINEERING  

For  
B.TECH. FOUR YEAR DEGREE COURSE  
(Applicable for the batch admitted during 2012-2013)
ACADEMIC REGULATIONS GN-R-12 FOR B.TECH. REGULAR COURSE

(Effective for the students admitted into I year from the Academic Year 2012-2013 and onwards)

1. Award of B.Tech. Degree
   A student will be declared eligible for the award of the B. Tech. Degree if he fulfils the following academic regulations:
   i. **Pursued a course of study for not less than four academic years and not more than eight academic years.**
   ii. Registered for **200 credits** and secured **200 credits**

2. Students, who fail to fulfill all the academic requirements for the award of the degree within eight academic years from the year of their admission, shall forfeit their seat in B.Tech course.

3. Courses of study
   The following courses of study are offered at present for specialization for the B. Tech. Course:

<table>
<thead>
<tr>
<th>Branch Code</th>
<th>Branch</th>
</tr>
</thead>
<tbody>
<tr>
<td>02</td>
<td>Electrical and Electronics Engineering</td>
</tr>
<tr>
<td>04</td>
<td>Electronics and Communication Engineering</td>
</tr>
<tr>
<td>05</td>
<td>Computer Science and Engineering.</td>
</tr>
<tr>
<td>12</td>
<td>Information Technology</td>
</tr>
<tr>
<td>17</td>
<td>Electronics and Telematics Engineering.</td>
</tr>
<tr>
<td>22</td>
<td>Instrumentation and Control Engineering.</td>
</tr>
</tbody>
</table>

4. Distribution and Weightage of Marks
   i. The performance of a student in each semester shall be evaluated subject-wise with a maximum of 100 marks for theory and 75 marks for practical subject. In addition, Industry oriented mini-project, seminar, comprehensive viva and project work shall be evaluated for 50, 50, 100 and 200 marks respectively.
   ii. For theory subjects the distribution shall be 25 marks for Internal Evaluation and 75 marks for the End-Examination.
   iii. For theory subjects, during the semester there shall be 2 midterm examinations. Each mid term examination consists of Part-A(Objective Type) for 5 marks and Part-B(subjective paper) for 15 marks with a duration of 2 Hrs. Assignment carries 5 marks. Subjective paper shall contain 5 questions(Covering all the units) of which student has to answer 3 questions each 5 marks.
FOR THE 2012 ADMITTED BATCH ONLY
Students performance in both the mid exams will be considered for evaluating the internal marks. For the best scored mid weightage of 75 %, and for the other 25 % weightage will be given.

FOR THE 2013 ADMITTED BATCH
Students performance in both the mid exams will be considered for evaluating the internal marks. Average performance of the two mids will be considered for evaluating internal marks.

\[
\text{Average Performance} = \frac{(X_1 + X_2)}{2}
\]

\(X_1\) = First Mid Marks, \(X_2\) = Second Mid Marks

The first mid term examination shall be conducted for 50 % of the syllabus and the second mid term examination shall be conducted for the remaining 50 % of the syllabus.

iv. For practical subjects there shall be a continuous evaluation during the semester for 25 sessional marks and 50 end examination marks. Out of the 25 marks for internal, day-to-day work in the laboratory shall be evaluated for 15 marks and internal examination for practical shall be evaluated for 10 marks conducted by the concerned laboratory teacher. The end examination shall be conducted with external examiner and laboratory teacher. The external examiner shall be appointed from the panel of examiners as decided by BOS.

v. For the Engineering Drawing subject the distribution shall be 25 marks for internal evaluation (15 marks for day-to-day work and 10 marks for internal tests) and 75 marks for end examination. Two internal tests will be conducted and Students performance in both the mid exams will be considered for evaluating the internal marks. For the best scored mid weightage of 75 %, and for the other 25 % weightage will be given.

vi. There shall be an industry-oriented mini-Project, in collaboration with an industry of their specialization, to be taken up during the vacation after III year II Semester examination. However, the mini project and its report shall be evaluated in IV year I Semester. The industry oriented mini project shall be submitted in report form and should be presented before the committee, which shall be evaluated for 50 marks. The committee consists of head of the department, the supervisor of mini project and a senior faculty member of the department. There shall be no internal marks for industry oriented mini project.
vii. There shall be a seminar presentation in IV year II Semester. For the seminar, the student shall collect the information on a specialized topic and prepare a technical report, showing his understanding over the topic, and submit to the department, which shall be evaluated by the Departmental committee consisting of Head of the department, seminar supervisor and a senior faculty member. The seminar report shall be evaluated for 50 marks. There shall be no external examination for seminar.

viii. There shall be a Comprehensive Viva-Voce in IV year II semester. The Comprehensive Viva-Voce will be conducted by a Committee consisting of (i) Head of the Department (ii) two Senior Faculty members of the Department. The Comprehensive Viva-Voce is aimed to assess the students’ understanding in various subjects he / she studied during the B.Tech course of study. The Comprehensive Viva-Voce is evaluated for 100 marks by the Committee. There are no internal marks for the Comprehensive viva-voce.

ix. Out of a total of 200 marks for the project work, 100 marks shall be for Internal Evaluation and 100 marks for the End Semester Examination. The End Semester Examination (viva-voce) shall be conducted by the committee consists of External examiner, HOD, the supervisor of the major project and a senior faculty of the dept. The topics for industry oriented mini project, seminar and project work shall be different from each other. The evaluation of project work shall be conducted at the end of the IV year II Semester. Out of the 100 marks for Internal evaluation 50 marks will be awarded by the supervisor, 50 marks will be awarded by the committee constituted by HOD shall be on the basis of two seminars given by each student on the topic of her project.

5. Attendance Requirements:
   i. A student shall be eligible to appear for University examinations if he acquires a minimum of 75% of attendance in aggregate of all the subjects.
   
   ii. **Shortage of Attendance below 65% in aggregate shall in NO case be condoned**.
   
   iii. Condonation of shortage of attendance in aggregate up to 10% (65% and above and below 75%) in each semester or I year may be granted by the College Academic Committee.
   
   iv. A student will not be promoted to the next semester unless he satisfies the attendance requirement of the present semester / I
year, as applicable. They may seek re-admission for that semester / I year when offered next.

v. Students whose shortage of attendance is not condoned in any semester / I year are not eligible to take their end examination of that class and their registration shall stand cancelled.

vi. A stipulated fee shall be payable towards condonation of shortage of attendance.

6. Minimum Academic Requirements:

The following academic requirements have to be satisfied in addition to the attendance requirements mentioned in item no. 5

i. A student shall be deemed to have satisfied the minimum academic requirements and earned the credits allotted to each theory or practical design or drawing subject or project if he secures not less than 35% of marks in the end examination and a minimum of 40% of marks in the sum total of the internal evaluation and end examination taken together.

ii. A student shall be promoted from II to III year only if he fulfils the academic requirement of 36 credits from TWO regular and ONE supplementary examinations of I year I Semester, and ONE regular and ONE supplementary examination of I Year II Semester, and ONE regular examination of II year I semester irrespective of whether the candidate takes the examination or not.

iii. A student shall be promoted from third year to fourth year only if he fulfils the academic requirements of total 60 credits from the following examinations, whether the candidate takes the examinations or not.

a. Three regular and two supplementary examinations of I year I Semester.

b. Two regular and two supplementary examinations of I year II Semester

c. Two regular and one supplementary examinations of II year I semester.

d. One regular and one supplementary examinations of II year II semester.

e. One regular examination of III year I semester.

iv. A student shall register and put up minimum attendance in all 200 credits and earn the 200 credits. Marks obtained in all 200 credits shall be considered for the calculation of percentage of marks.
v. Students who fail to earn 200 credits as indicated in the course structure within eight academic years from the year of their admission shall forfeit their seat in B.Tech course and their admission shall stand cancelled.

7. **Course pattern:**
   i. The entire course of study is of four academic years. All the I, II, III and IV years are on semester pattern.
   ii. A student eligible to appear for the end examination in a subject, but absent at it or has failed in the end examination may appear for that subject at the supplementary examination.

8. **Award of Class:**
   After a student has satisfied the requirements prescribed for the completion of the program and is eligible for the award of B. Tech. Degree he shall be placed in one of the following four classes:

<table>
<thead>
<tr>
<th>Class Awarded</th>
<th>% of marks to be secured</th>
<th>From the aggregate marks secured for the best 200 Credits.</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Class with Distinction</td>
<td>70% and above</td>
<td></td>
</tr>
<tr>
<td>First Class</td>
<td>Below 70% but not less than 60%</td>
<td></td>
</tr>
<tr>
<td>Second Class</td>
<td>Below 60% but not less than 50%</td>
<td></td>
</tr>
<tr>
<td>Pass Class</td>
<td>Below 50% but not less than 40%</td>
<td></td>
</tr>
</tbody>
</table>

(The marks in internal evaluation and end examination shall be shown separately in the marks memorandum)

9. **Minimum Instruction Days:**
   The minimum instruction days for each semester shall be 90 clear instruction days.

10. **There shall be no branch transfers after the completion of admission process.**

11. **General:**
   i. Where the words “he”, “him”, “his”, occur in the regulations, they include “she”, “her”, “hers”.
   ii. The academic regulation should be read as a whole for the purpose of any interpretation.
   iii. In the case of any doubt or ambiguity in the interpretation of the above rules, the decision of the PRINCIPAL/DIRECTOR is final.
   iv. The COLLEGE may change or amend the academic regulations or syllabi at any time and the changes or amendments made shall be applicable to all the students with effect from the dates notified by the COLLEGE.
ACADEMIC REGULATIONS FOR B. TECH. (LATERAL ENTRY SCHEME)
(Effective for the students getting admitted into II year from the Academic Year 2013-2014 and onwards)

1. The Students have to acquire 150 credits from II to IV year of B.Tech. Program (Regular) for the award of the degree.
   Register for 150 credits and secure 150 credits.

2. Students, who fail to fulfil the requirement for the award of the degree in 6 consecutive academic years from the year of admission, shall forfeit their seat.

3. The same attendance regulations are to be adopted as that of B. Tech. (Regular).

4. Promotion Rule:
   A student shall be promoted from third year to fourth year only if he fulfils the academic requirements of 36 credits from the examinations.
   a. Two regular and one supplementary examinations of II year I semester.
   b. One regular and one supplementary examinations of II year II semester.
   c. One regular examination of III year I semester.

5. Award of Class:
   After a student has satisfied the requirements prescribed for the completion of the program and is eligible for the award of B. Tech. Degree he shall be placed in one of the following four classes:

<table>
<thead>
<tr>
<th>Class Awarded</th>
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<th>From the aggregate marks secured for the best 200 Credits.</th>
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</thead>
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<td>First Class with Distinction</td>
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<td></td>
</tr>
<tr>
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</tr>
<tr>
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<td></td>
</tr>
<tr>
<td>Pass Class</td>
<td>Below 50% but not less than 40%</td>
<td></td>
</tr>
</tbody>
</table>
## MALPRACTICES RULES
### DISCIPLINARY ACTION FOR / IMPROPER CONDUCT IN EXAMINATIONS

<table>
<thead>
<tr>
<th>Nature of Malpractices/ Improper conduct</th>
<th>Punishment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>If the candidate:</strong></td>
<td></td>
</tr>
<tr>
<td>1. (a) Possesses or keeps accessible in examination hall, any paper, note book, programmable calculators, Cell phones, pager, palm computers or any other form of material concerned with or related to the subject of the examination (theory or practical) in which he is appearing but has not made use of (material shall include any marks on the body of the candidate which can be used as an aid in the subject of the examination)</td>
<td>Expulsion from the examination hall and cancellation of the performance in that subject only.</td>
</tr>
<tr>
<td>(b) Gives assistance or guidance or receives it from any other candidate orally or by any other body language methods or communicates through cell phones with any candidate or persons in or outside the exam hall in respect of any matter.</td>
<td>Expulsion from the examination hall and cancellation of the performance in that subject only of all the candidates involved. In case of an outsider, he will be handed over to the police and a case is registered against him.</td>
</tr>
<tr>
<td>2. Has copied in the examination hall from any paper, book, programmable calculators, palm computers or any other form of material relevant to the subject of the examination (theory or practical) in which the candidate is appearing.</td>
<td>Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted to appear for the remaining examinations of the subjects of that Semester/year. The Hall Ticket of the candidate is to be cancelled.</td>
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</tr>
<tr>
<td>3.</td>
<td>Impersonates any other candidate in connection with the examination.</td>
</tr>
<tr>
<td></td>
<td>The candidate who has impersonated shall be expelled from examination hall. The candidate is also debarred and forfeits the seat. The performance of the original candidate who has been impersonated, shall be cancelled in all the subjects of the examination (including practicals and project work) already appeared and shall not be allowed to appear for examinations of the remaining subjects of that semester/year. The candidate is also debarred for two consecutive semesters from class work and all END examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat. If the imposter is an outsider, he will be handed over to the police and a case is registered against him.</td>
</tr>
<tr>
<td>4.</td>
<td>Smuggles in the Answer book or additional sheet or takes out or arranges to send out the question paper during the examination or answer book or additional sheet, during or after the examination.</td>
</tr>
<tr>
<td></td>
<td>Expulsion from the examination hall and cancellation of performance in that subject and all the other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred for two consecutive semesters from class work and all END examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat.</td>
</tr>
<tr>
<td></td>
<td>Uses objectionable, abusive or offensive language in the answer paper or in letters to the examiners or writes to the examiner requesting him to award pass marks.</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>6.</td>
<td>Refuses to obey the orders of the Chief Superintendent/Assistant – Superintendent / any officer on duty or misbehaves or creates disturbance of any kind in and around the examination hall or organizes a walk out or instigates others to walk out, or threatens the officer-in-charge or any person on duty in or outside the examination hall of any injury to his person or to any of his relations whether by words, either spoken or written or by signs or by visible representation, assaults the officer-in-charge, or any person on duty in or outside the examination hall or any of his relations, or indulges in any other act of misconduct or mischief which result in damage to or destruction of property in the examination hall or any part of the College campus or engages in any other act which in the opinion of the officer on duty amounts to use of unfair means or misconduct or has the tendency to disrupt the orderly conduct of the examination.</td>
</tr>
<tr>
<td>7.</td>
<td>Leaves the exam hall taking away answer script or intentionally tears of the script or any part thereof inside or outside the examination hall.</td>
</tr>
</tbody>
</table>
including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred for two consecutive semesters from class work and all END examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat.

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<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>8.</td>
<td>Possess any lethal weapon or firearm in the examination hall.</td>
<td>Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred and forfeits the seat.</td>
</tr>
<tr>
<td>9.</td>
<td>If student of the college, who is not a candidate for the particular examination or any person not connected with the college indulges in any malpractice or improper conduct mentioned in clause 6 to 8.</td>
<td>Student of the colleges expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred and forfeits the seat. Person(s) who do not belong to the College will be handed over to police and a police case will be registered against them.</td>
</tr>
<tr>
<td>10.</td>
<td>Comes in a drunken condition to the examination hall.</td>
<td>Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year.</td>
</tr>
<tr>
<td>11.</td>
<td>Copying detected on the basis of internal evidence, such as, during valuation or during special scrutiny.</td>
<td>Cancellation of the performance in that subject and all other subjects the candidate has appeared including practical examinations and project work of that semester/year examinations.</td>
</tr>
<tr>
<td>12.</td>
<td>If any malpractice is detected which is not covered in the above clauses 1 to 11 shall be reported to the PRINCIPAL/DIRECTOR for further action to award suitable punishment.</td>
<td></td>
</tr>
</tbody>
</table>
**B.Tech (ELECTRONICS & TELEMATICS ENGINEERING)**
**BATCH ADMITTED FROM 2012**

### I Year I Semester

<table>
<thead>
<tr>
<th>S.No</th>
<th>Code</th>
<th>Name of the Subject</th>
<th>L</th>
<th>T/P/D</th>
<th>C</th>
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</thead>
<tbody>
<tr>
<td>1.</td>
<td>120007</td>
<td>Mathematics - I</td>
<td>4</td>
<td>1</td>
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<tr>
<td>2.</td>
<td>120203</td>
<td>Electrical Circuits</td>
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<td>3.</td>
<td>120501</td>
<td>Computer Programming</td>
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<td>4.</td>
<td>120006</td>
<td>Mathematics - II</td>
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<td>5.</td>
<td>120001</td>
<td>Engineering Chemistry</td>
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<td>6.</td>
<td>120502</td>
<td>Computer Programming Lab</td>
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<tr>
<td>7.</td>
<td>120204</td>
<td>Electrical Circuits Lab</td>
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<td>8.</td>
<td>120002</td>
<td>Engineering Chemistry Lab</td>
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**Total** 20 12 26

### I Year II Semester

<table>
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<th>L</th>
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<tbody>
<tr>
<td>1.</td>
<td>120016</td>
<td>Mathematics - III</td>
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<td>2.</td>
<td>120012</td>
<td>Engineering Drawing</td>
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<td>120017</td>
<td>Engineering Physics</td>
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<td>4.</td>
<td>120013</td>
<td>English</td>
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<td>5.</td>
<td>120503</td>
<td>Data Structures</td>
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<td>6.</td>
<td>120018</td>
<td>Engineering Physics Lab</td>
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<td>120014</td>
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<td>Data Structures Lab</td>
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**Total** 18 16 24
## II Year - I Semester

<table>
<thead>
<tr>
<th>S.No</th>
<th>Code</th>
<th>Name of the Subject</th>
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<tr>
<td>1.</td>
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<td>Environmental Studies</td>
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<td>Mathematics-IV</td>
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<tr>
<td>3.</td>
<td>120403</td>
<td>Electronic Devices &amp; Circuits</td>
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<tr>
<td>4.</td>
<td>120213</td>
<td>Principles of Electrical Engineering</td>
<td>3</td>
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<tr>
<td>5.</td>
<td>120406</td>
<td>Signal and Systems</td>
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<td>6.</td>
<td>121701</td>
<td>Basic Simulation Lab</td>
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<td>7.</td>
<td>121703</td>
<td>Electronic Devices &amp; Circuits Lab</td>
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<td>8.</td>
<td>121702</td>
<td>Electrical Engineering Lab.</td>
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## II Semester

<table>
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<tr>
<th>S.No</th>
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<tbody>
<tr>
<td>1.</td>
<td>121709</td>
<td>Switching Theory &amp; Logic Design</td>
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<td>120409</td>
<td>Electronic Circuit Analysis</td>
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<td>3.</td>
<td>121707</td>
<td>Pulse &amp; Digital Circuits</td>
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<td>4.</td>
<td>121706</td>
<td>Probability Theory &amp; Stochastic Process</td>
<td>4</td>
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<td>5.</td>
<td>120407</td>
<td>Control Systems</td>
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<td>6.</td>
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<td>7.</td>
<td>121705</td>
<td>Electronic Circuit Analysis Lab</td>
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<td>8.</td>
<td>121708</td>
<td>Pulse &amp; Digital Circuits Lab</td>
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<td></td>
<td><strong>Total</strong></td>
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<td>12</td>
<td>26</td>
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### III Year - I Semester

<table>
<thead>
<tr>
<th>S.No</th>
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### III Year - II Semester

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### IV Year - I Semester

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**ELECTIVE – I**

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**ELECTIVE – II**

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### IV Year - II Semester

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**Note:** All End Examinations (Theory and Practical) are of three hours duration.

**T - Tutorial   L – Theory   P – Practical   D – Drawing   C – Credits**
MATHEMATICS – I

I Year - I Sem. L T/P/D C
4 /-/- 4

OBJECTIVES : The objective of this course is to understand the concepts of calculus of single and several variables.

UNIT – I


Mean Value Theorems: Rolle’s Theorem – Lagrange’s Mean Value Theorem – Cauchy’s Mean Value Theorem – Generalized Mean Value theorem. (All theorems without proof)

UNIT – II

FUNCTIONS OF SEVERAL VARIABLES : Functions of Several Variables: Functional Dependence - Jacobian- Maxima and Minima of functions of two variables with constraints and without constraints.

Radius of Curvature - Centre and Circle of Curvature – Evolutes and Involutes- Envelopes. (All concepts in Cartesian Coordinates)

UNIT – III


UNIT – IV


UNIT – V

MULTIPLE INTEGRALS AND VECTOR INTEGRAL THEOREMS : Multiple integrals: Double and Triple Integrals – Change of Order of Integration- change of variables.


Vector Integral Theorems: Green’s, Stoke’s and Gauss’s Divergence Theorems (Statement & their Verification).
TEXT BOOKS

REFERENCES:
OBJECTIVE: This course introduces the basic concepts of circuit analysis which is the foundation for all the subjects of the Electrical Engineering discipline. The emphasis in this course is laid on the basic Analysis of circuits which includes single phase circuits, magnetic circuits, theorems and network topology.

UNIT - I
ANALYSIS OF ELECTRICAL CIRCUITS : Circuit concept – R-L-C Parameters – Voltage & Current Sources – Independent and dependent sources – Source Transformation - Voltage-Current relationships for passive elements (for different input signals – square, ramp, saw tooth, triangular)
Kirchoff’s laws – Network reduction techniques – series, parallel, series parallel, star to delta & delta to star conversion, Nodal analysis, mesh analysis, Super node & super mesh for DC excitations

UNIT - II
SINGLE PHASE AC CIRCUITS : RMS & Average Values and form Factor for different periodic wave forms, Steady state Analysis of R, L, & C (in series, parallel and series parallel combinations) with sinusoidal excitation–Concept of Reactance, Impedance, Susceptance and Admittance – Phase & phase difference – Concept of power factor, Real & reactive powers–j-Notation, Complex and Polar forms of representation, Complex Power

UNIT - III
Concept of self & mutual inductance–dot convention–Coefficient of coupling – Elementary treatment of Coupled circuits

UNIT - IV
NETWORK TOPOLOGY : Definitions – Graph – Tree, Basic cutset & basic tieset matrices for planar networks – Loop & nodal methods of Analysis of Networks with dependent & independent voltage & current sources – Duality & dual networks
UNIT - V

NETWORK THEOREMS (AC & DC EXCITATIONS) : Tellegen’s, Superposition, Reciprocity, Thevenin’s, Norton’s, Maximum Power Transfer, Millman’s and Compensation theorems for AC & DC excitations

TEXTBOOKS:
2. Circuits & Networks by A. Sudhakar and Shyammohan S. Palli, Tata McGraw Hill.

REFERENCE BOOKS:
1. Network Analysis by M.E. Van Valkenberg.
4. Basic Circuit Analysis by D.R. Cunningham & J.A. Stuller, Jaico Publication
COMPUTER PROGRAMMING

I Year - I Sem.

UNIT - I

INTRODUCTION TO COMPUTERS: Introduction to computers, computer systems, computing environments, computer languages, creating and running programs, software development method, algorithms, pseudo code, flow charts, applying the software development method.

INTRODUCTION TO C LANGUAGE: Basic structures of C language, C tokens, data types and sizes, declaration of variables, assigning values.

OPERATORS AND EXPRESSIONS: Statements, arithmetic, relational and logical operators, increment and decrement operators, conditional operator, bitwise operators, type conversions, expressions and evaluation, input and output statements, Header files, C preprocessor, Programming examples.

UNIT - II

CONTROL STATEMENTS: Conditional and control statements, programming examples.

FUNCTIONS: Defining and accessing, parameter passing, function prototypes, user defined functions, recursive functions, programming examples.

Storage Classes, Scope rules, programming example.

ARRAYS: Defining and processing, one dimensional and two dimensional arrays, initialization, passing arrays to a function, multi dimensional arrays, command line arguments.

UNIT - III

STRINGS: Defining and operations on strings, string variables declaration, reading, writing.

Passing strings as parameters, string handling functions.

POINTERS: Basic Concepts, pointer to pointer, passing pointers to a function, operations on pointers, pointer arithmetic, pointers and arrays, arrays of pointers, function pointers, dynamic memory allocation.

UNIT - IV

STRUCTURES AND UNIONS: Structure definition, initializing, assigning values, passing of structures as arguments, arrays of structures, pointers to structures, self reference to structures, unions, typedef, enumerated, bit fields, programming examples.
UNIT - V

CONSOLE AND FILE I/O: File, types of files, file vs. console, file structure, file attributes, file operations, standard I/O, formatted I/O, programming examples.

TEXT BOOKS:

REFERENCE BOOKS:
3. Software Series, India.
OBJECTIVE : The prime objective of this course is to solve linear and nonlinear systems by using the concepts in Matrices and numerical methods.

UNIT – I


UNIT – II


UNIT – III


CURVE FITTING: Fitting a Straight line – Second Degree Curve- Exponentional curve - Power Curve by the Method of Least Squares.

UNIT – IV

UNIT – V


TEXT BOOKS:

REFERENCES:
1. Introductory Methods by Numerical Analysis by S.S. Sastry, PHI Learning Pvt. Ltd.
ENGINEERING CHEMISTRY

I Year - I Sem.  

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OBJECTIVES:

1. To furnish the conceptual understanding of the basic principles of chemistry.
2. To develop the habit of scientific reasoning in students so that they can work with open and inquiring mind.
3. To impart extensive knowledge of the subject to make them understand the role of chemistry in the field of Engineering.
4. To develop analytical capabilities of chemistry so that they can apply knowledge gained in solving engineering related problems.

UNIT - I


UNIT - II

UNIT - III

UNIT - IV

UNIT - V


TEXT BOOKS:

REFERENCE BOOKS
Recommended Systems/Software Requirements:
Intel based desktop PC ‘gcc’ Compiler for CSE and IT branches, ‘ANSI C’ Compiler for other branches.

Week 1.
(a) Write a C program to calculate the following Sum:
\[ \text{Sum}=1-x^2/2! +x^4/4!-x^6/6!+x^8/8!-x^{10}/10! \]
(b) Write a C program to find the roots of a quadratic equation.

Week 2.
(a) Write a C program to find the sum of individual digits of a positive integer.
(b) A Fibonacci Sequence is defined as follows: the first and second terms in the sequence are 0 and 1. Subsequent terms are found by adding the preceding two terms in the sequence. Write a C program to generate the first n terms of the sequence.
(c) Write a C program to generate all the prime numbers between 1 and n, where n is a value supplied by the user.

Week 3
(a) The total distance travelled by vehicle in ‘t’ seconds is given by distance = ut+1/2at^2 where ‘u’ and ‘a’ are the initial velocity (m/sec.) and acceleration (m/sec^2). Write C program to find the distance travelled at regular intervals of time given the values of ‘u’ and ‘a’. The program should provide the flexibility to the user to select his own time intervals and repeat the calculations for different values of ‘u’ and ‘a’.
(b) Write a C program, which takes two integer operands and one operator form the user, performs the operation and then prints the result. (Consider the operators +,-,*, /, % and use Switch Statement)

Week 4
(a) Write a C program to generate Pascal’s triangle.
(b) Write a C program to construct a pyramid of numbers.

Week 5
Write a C program to read in two numbers, x and n, and then compute the sum of this geometric progression:
\[ 1+x+x^2+x^3+\ldots\ldots\ldots+x^n \]
For example: if n is 3 and x is 5, then the program computes 1+5+25+125. Print x, n, the sum
Perform error checking. For example, the formula does not make sense for negative exponents – if $n$ is less than 0. Have your program print an error message if $n<0$, then go back and read in the next pair of numbers of without computing the sum. Are any values of $x$ also illegal? If so, test for them too.

**Week 6**

Write a C program to implement:

i) Precedence and associativity

ii) Bit Manipulation using switch case

**Week 7**

Write C programs that use both recursive and non-recursive functions

i) To find the factorial of a given integer.

ii) To find the GCD (greatest common divisor) of two given integers.

iii) To solve Towers of Hanoi problem. (Recursion)

**Week 8**

a) 2’s complement of a number is obtained by scanning it from right to left and complementing all the bits after the first appearance of a 1. Thus 2’s complement of 11100 is 00100. Write a C program to find the 2’s complement of a binary number.

b) Write a C program that uses functions to perform the following:

i) Addition & Multiplication of 2 matrices

ii) Determinant of matrix and inverse of a matrix

**Week 9**

a) Write a C program that uses functions to perform the following operations:

i) To insert a sub-string in to given main string from a given position.

ii) To delete n Characters from a given position in a given string.

b) Write a C program to determine if the given string is a palindrome or not

**Week 10**

a) Write a C program that displays the position or index in the string $S$ where the string $T$ begins, or – 1 if $S$ doesn’t contain $T$.

b) Write a C program to count the lines, words and characters in a given text.

**Week 11**

Write a C program that uses functions to perform the following operations:

i) Reading a complex number
ii) Writing a complex number
iii) Addition of two complex numbers
iv) Multiplication of two complex numbers
(Note: represent complex number using a structure.)

Week 12
a) Write a C program which copies one file to another.
b) Write a C program to reverse the first n characters in a file.
(Note: The file name and n are specified on the command line.)
ELECTRIC CIRCUITS LAB

I Year - I Sem.

Any Ten experiments have to be conducted from the following list:

1) Thevenin’s, Norton’s
2) Maximum Power Transfer theorems.
3) Superposition theorem
4) RMS value of complex wave
5) Verification of Compensation Theorem.
6) Reciprocity, Millmann’s Theorems.
7) Locus Diagrams of RL and RC Series Circuits
8) Series and Parallel Resonance
9) Determination of Self, Mutual Inductances and Coefficient of coupling
10) Measurement of Active Power for Star and Delta connected balanced loads
11) Measurement of Reactive Power for Star and Delta connected balanced loads
12) Measurement of 3-phase Power by two Wattmeter Method for unbalanced loads
List of the Experiments

Any 10 Experiments of the Following:

1. Estimation of Ferrous ion by dichrometry by using Mohr’s salt
2. Estimation of hardness of water by EDTA method
3. Estimation of manganese dioxide in pyrolusite
4. Determination of surface tension of lubricants
5. Titration of strong acid VS strong base by conductometric method
6. Titration of strong acid VS strong base by potentiometric method
7. Estimation of Copper by Colorimetric method
8. Estimation of Iron in Cement by Colorimetric method
9. Conductometric titration of mixture of acids Vs strong base
10. Determination of viscosity of sample oil by Ostwald’s viscometer
11. Determination of dissociation constant of weak acid by Conductometric method.
12. Preparation of Thiokol rubber

TEXT BOOKS:
2. Practical Engineering Chemistry by K.Mukkanti, etal, B.S. Publications, Hyderabad
3. Inorganic quantitative analysis, Vogel

REFERENCE BOOKS:
1. Text Book of Engineering chemistry by R.N. Goyal and Harrmendra Goel
2. A text book on experiments and calculation Engg. S.S. Dara
3. Instrumental methods of chemical analysis, Chatwal, Anand, Himalaya Publications
OBJECTIVE: The core objective of this paper is to solve the differential equations by using analytical methods and integral transform methods.

UNIT – I
LINEAR DIFFERENTIAL EQUATIONS WITH CONSTANT COEFFICIENTS & APPLICATIONS: Linear differential equations with constant coefficients - Method of Variation of Parameters. Applications in Electrical Circuits, Simple Harmonic Motion.

UNIT – II

UNIT – III

UNIT – IV

UNIT – V
Applications of Fourier Transforms in IVPs and BVPs: Infinite Fourier Transforms – Choice of Infinite Sine or Cosine Transforms Examples.

TEXT BOOKS:

REFERENCES:
ENGINEERING DRAWING

I Year - II Sem. L T/P/D C
2 -/- 4 3

CHAPTER : 1

CHAPTER : 2
Principle of orthographic projections –Conventions-First angle and Third angle projections, Projections of Points and Lines. (Excluding traces of a line)

CHAPTER : 3
Projections of regular planes inclined to both the planes.

CHAPTER : 4
Projections of regular Solids inclined to both the planes.

CHAPTER : 5

Text Book :
Engineering Drawing by N.D.Bhatt
ENGINEERING PHYSICS

I Year – II Sem.  

L  T/P/D  C  
4  1/-/-  4

OBJECTIVES: This course imparts students, the basic knowledge of the electromagnetic properties, and optical properties which form the requirement for understanding and applying principles of physics for electronic, electrical and communicational engineering. This also enhances the classical to Quantum mechanical

UNIT - I


Space Lattice, Unit Cell, Lattice Parameters, Crystal Systems, Miller Indices, Crystal Planes and Directions, Inter Planar Spacing of Orthogonal Crystal Systems, Atomic Radius, Co-ordination Number and Packing Factor of SC, BCC, FCC. X-ray diffraction by powder method. (4 Periods)

2. DEFECTS IN CRYSTALS: Point Defects: Vacancies, Substitution, Interstitial, Frenkel and Schottky Defects; Equilibrium concentration of point defects (vacancies, Frenkel and Schottky defects.) (4 Periods)

UNIT - II


4. PRINCIPLES OF QUANTUM MECHANICS: Waves and Particles, de Broglie Hypothesis, Matter Waves, Davisson and Germer Experiment, Heisenberg’s Uncertainty Principle (Qualitative Treatment), Schrodinger’s Time Independent Wave Equation - Physical Significance of the Wave Function. Particle in One Dimensional Potential Box. (5 Periods)

UNIT - III


6. SEMICONDUCTOR PHYSICS: Fermi Levels in Intrinsic and Extrinsic Semiconductors, Carrier Concentration in Intrinsic and Extrinsic Semiconductors. Drift and diffusion current in semiconductors (Qualitative
Treatment) and Equation of Continuity, Direct & Indirect Band Gap Semiconductors, Hall Effect and its applications. (7 Periods)

UNIT - IV


UNIT - V


10. FIBER OPTICS : Principle of Optical Fiber, Acceptance Angle and Acceptance Cone, Numerical Aperture, Types of Optical Fibers (Step index and graded index fibers) and Refractive Index Profiles, Attenuation in Optical Fibers, Application of Optical Fibers (Engineering, Medical and Scientific fields). (3 Periods)

11. NANOTECHNOLOGY: Origin of Nanotechnology, Nano Scale, Surface to Volume Ratio, Quantum Confinement, Bottom-up Fabrication: Sol-gel, Top-down Fabrication: Chemical Vapour Deposition, Characterization (XRD&TEM) and Applications. (4 Periods)

TEXT BOOKS:

REFERENCES:
3. Physics and Chemistry of Materials-Gersten, FW Sakhir
4. Material Science and Engineerin -Raghavan
ENGLISH

I Year B.Tech-II Sem        L  T/P/D  C
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OBJECTIVES:

a. To improve the language proficiency of the students in English with emphasis on LSRW skills.

b. To equip the students to cope the academic subjects with greater facility through the theoretical and practical components of the English syllabi.

c. To develop the study skills and communication skills in formal and informal situations.

SYLLABUS

UNIT – I

1. Chapter entitled Heaven’s Gate from “Enjoying Everyday English”, Published by Sangam Books, Hyderabad.

2. Chapters 1-6 from Wings of Fire: An Autobiography, APJ. Abdul Kalam with Arun Tiwari, University Press.

3. Grammar : Nouns, Pronouns, Articles, Prepositions and Conjunctions


5. Writing : Paragraphs and Descriptions

UNIT – II


2. Chapters 7-12 from Wings of Fire: An Autobiography, APJ. Abdul Kalam with Arun Tiwari, University Press.

3. Grammar : Adjectives and Adverbials

4. Vocabulary : Words often confused – Homophones, Homonyms and Homographs

5. Writing : Summarising and Note-making

UNIT – III


3. Grammar : Tenses and Concord

5. Writing : Official correspondence – Memorandums, reports, letters and e-mails

UNIT – IV
1. Chapter entitled Odds Against Us from “Enjoying Everyday English”, Published by Sangam Books, Hyderabad.
3. Grammar : Interrogative Sentences and Question Tags
4. Vocabulary : One word substitutes and analogies
5. Writing : Covering letter and Resume writing

UNIT – V

TEXT BOOKS/BOOKS PRESCRIBED

For General Reading
The Diary of a Young Girl by Anne Frank
Short stories by O’Henry
Swami and his Friends by R.K.Narayan
How I taught my grand mother to read by Sudha Murthy
Brave New World by H.G.Wells

REFERENCES :
1. Objective English, Edgar Thorpe & Showick Thorpe, Pearson Education.
2. Murphy’s English Grammar with CD, Murphy, Cambridge University Press.
5. Professional Ethics, Jayshree Suresh & B.S.Raghavan, S.Chand & Company Ltd.
DATA STRUCTURES

I Year B.Tech-II Sem

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UNIT - I
Searching: Linear and binary search methods.
Sorting: Bubble sort, selection sort, Insertion sort, Quick sort, Merge sort, Heap sort, Shell sort, Radix sort. Time complexities.

UNIT - II
Stacks, Queues, Circular queues, Dequeues working and representation using arrays, Applications of stacks :infix to post fix conversion, postfix expression evaluation.

UNIT - III
Linked list: Singly linked list, Doubly linked list, Circular linked list working and representation using pointers. Implementation of stacks and queues using pointers.

UNIT - IV
Trees: Terminology, sequential and linked representation, tree traversals. Binary trees, Binary search trees.

UNIT - V

TEXT BOOKS:

REFERENCES :
1. C Programming & Data structures – E. Balaguru Swami, TMH
2. The C Programming Language, B.W. Kernighan, Dennis M.Ritchie, PHI/ Pearson Education
ENGINEERING PHYSICS LAB

I year B.Tech-II Sem

L T/P/D C
0 3 2

LIST OF THE EXPERIMENTS

1. Dispersive power of the material of a Prism – Spectrometer.
3. Size of the particle and Quantum Confinement.
4. Time constant of R-C Circuit.
5. Magnetic field along the axis of the current carrying coil- Stewart & Gees’
6. Evaluation of Numerical Aperture
7. Evaluation Bending losses of fibers.
9. Torsional pendulum
10. Laser wavelength determination using Diffraction grating.
11. Dielectric constant.

TEXT BOOKS:

1. Practical Engineering Physics by T. Radha Krishna & V. Rajeshwar Rao (VGS Techno Series)
2. Laboratory Manual of Engineering Physics by Dr. Y. Aaprna & Dr. K. Venkateswara Rao (SM Enterprises.)

REFERENCE BOOKS:

1. Experiments in Engineering Physics by MN Avadhanlu, AA Dani, PM Polkey - S.C HAND
ENGLISH LAB

I Year B.Tech. L T/P/D C
- /3/- 2

The Language Lab focuses on the production and practice of sounds of language and familiarises the students with the use of English in everyday situations and contexts.

OBJECTIVES:

a. To expose the students to a variety of self-instructional, learner-friendly modes of language learning.

b. To enable them to learn better pronunciation through stress on word accent, intonation, and rhythm.

c. To train them to use language effectively to face interviews, group discussions, public speaking.

d. To initiate them into greater use of the computer in resume preparation, report writing, format-making etc.

SYLLABUS:

The following course content is prescribed for the English Language Laboratory sessions:

1. Introduction to the Sounds of English- Vowels, Diphthongs & Consonants
2. Introduction to Accent and Rhythm – Stress and Intonation
3. Pronouncing words: Important patterns
4. Situational Dialogues / Role Play
5. Presentation Skills
6. ‘Just A Minute‘ Sessions (JAM)
7. Descriptions and Narrations
8. Information Transfer
9. Debating Skills
10. Telephonic conversations
11. Group Discussions
12. Interview Skills

MINIMUM REQUIREMENT:

The English Language Lab shall have two parts:

i) The Computer aided Language Lab for 30 students with 30 systems, one master console, LAN facility and English language software for self-study by learners.
ii) The Communication Skills Lab with movable chairs and audio-visual aids with a P.A System, a Multimedia Projector a digital stereo – audio & video system and camcorder etc.

System Requirement (Hardware component):
Computer network with Lan with minimum 30 multimedia systems with the following specifications:

i) CPU Requirements
   a) Duel Core Processor
   b) Speed – 2.8 GHZ
   c) RAM – 1 GB Minimum
   d) Hard Disk – 80 GB Minimum
   e) DVD ROM Drive

ii) Headphones of High quality

Suggested Software:
- Cambridge Advanced Learners’ English Dictionary with CD.
- Murphy’s English Grammar with CD, Cambridge University, Press.
- Pronunciation in Use by Mark Hancock, Cambridge University Press.
- Test Your English Vocabulary in Use by Michael McCarthy and Felicity O’Dell, Cambridge University Press.
- BBC Speak English

REFERENCES:

DISTRIBUTION AND WEIGHTAGE OF MARKS

English Language Laboratory Practical Paper:
1. The practical examinations for the English Language Laboratory shall be conducted as per the norms stipulated for the core engineering practical sessions.

2. For the Language lab sessions, there shall be a continuous evaluation during the semester for 25 sessional marks and 50 year-end Examination marks. Of the 25 marks, 15 marks shall be awarded for day-to-day work and 10 marks to be awarded by conducting Internal Lab Test(s). The year-end Examination shall be conducted by the teacher concerned with an external examiner from the other Universities or colleges.
DATA STRUCTURES LAB

I Year II-Sem L T/P/D C
- /3/- 2

Week 1
Write C programs that use both recursive and non recursive functions to perform the following searching operations for a Key value in a given list of integers:
  i) Linear search  ii) Binary search

Week 2
Write C programs that implement the following sorting methods to sort a given list of integers in ascending order:
  i) Bubble sort  ii) Selection sort

Week 3
Write C programs that implement the following sorting methods to sort a given list of integers in ascending order:
  i) Insertion sort  ii) Quick Sort

Week 4
Write C programs that implement stack (its operations) using
  i) Arrays ii) Pointers

Week 5
Write C programs that implement Queue (its operations) using
  i) Arrays ii) Pointers

Week 6
Write a program to convert the given infix expression to post-fix expression.

Week 7
Write a program to evaluate a post-fix expression.

Week 8
Write C programs to implement the following using arrays
  i) Circular queue ii) Dequeue

Week 9
Write a C program that uses functions to perform the following operations on singly linked list:
  i) Creation ii) Insertion iii) Deletion iv) Traversal
Week 10
Write a C program that uses functions to perform the following operations on doubly linked list:
  i) Creation  ii) Insertion  iii) Deletion  iv) Traversal in both ways

Week 11
Write a C program that uses functions to perform the following operations on circular linked list:
  i) Creation  ii) Insertion  iii) Deletion  iv) Traversal

Week 12
Write a C program that uses functions to perform the following:
  i) Creating a Binary Tree of integers
  ii) Traversing the above binary tree in preorder, in order and post order.

TEXT BOOKS
3. C and Data Structures, E Balaguruswamy, TMH publications.
ENVIRONMENTAL STUDIES
(Common to all Branches)

II Year B.Tech I Semester

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OBJECTIVES: To fulfill the requirement of UGC as per the direction of Supreme Court of India. To create awareness & sensitize the young minds about the environmental issues & their impacts on various environmental components. To motivate the students about the conservation of resources and protection of Environment from over exploitation. To bring awareness regarding various Environmental Policy of India.

UNIT - I

ECO-SYSTEMS: Definition, Scope and Importance of ecosystem. Classification, structure and function of an ecosystem, Food chains, food webs and ecological pyramids. Flow of energy, Biogeochemical cycles, Bioaccumulation, Biomagnification, ecosystem value, services and carrying capacity, Field visits.

UNIT-II

ENVIRONMENTAL POLLUTION AND CONTROL TECHNOLOGIES:


UNIT- III

NATURAL RESOURCES: CLASSIFICATION OF RESOURCES: Living and Non-Living resources, water resources: use and over utilization of surface and ground water, floods and droughts, Dams: benefits and problems. Mineral resources: use and exploitation, environmental effects of extracting and using mineral resources, Land resources: Forest resources, Energy resources: growing energy needs, renewable and non renewable energy sources, use of alternate energy source, case studies.
UNIT - IV

BIODIVERSITY & BIOTIC RESOURCES : Introduction, Definition, genetic, species and ecosystem diversity. Value of biodiversity; consumptive use, productive use, social, ethical, aesthetic and optional values. India as a mega diversity nation, Hot spots of biodiversity. Field visit. Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts; conservation of biodiversity: In-Situ and Ex-situ conservation. National Biodiversity act

UNIT- V


OUTCOMES :
Students will get knowledge on aspects & issues of Environment. Improved the attitude & thinking of the students will be positively towards earth & environment. It helps the students to improve the quality of life. Students will be benefited by knowing the concepts like Green Buildings, Low Carbon Lifestyle, International conventions etc.

TEXT BOOKS

REFERENCES
OBJECTIVE:
The objective of this course is to study the special functions, analytic functions and to solve the problems in complex variable theory.

UNIT- I
Legendre’s polynomials - Properties – Rodrigue’s formula – Recurrence relations – Orthogonality.

UNIT - II

UNIT - III

UNIT - IV
Evaluation of integrals of the type

(a) Improper real integrals \(\int_{-\infty}^{\infty} f(x)dx\)

(b) \(\int_{0}^{2\pi} f(\cos \theta, \sin \theta)d\theta\)

(c) \(\int_{-\infty}^{\infty} e^{imx} f(x)dx\)

(d) Integrals by indentation.
UNIT-V

CONFORMAL MAPPING: Transformation by $e^z$, $z^n$ (n positive integer), Sin $z$, $z + a/z$. Translation, rotation, inversion and bilinear transformation – Fixed point – Cross ratio – Properties – Invariance of circles and cross ratio – Determination of bilinear transformation mapping 3 given points.

TEXT BOOKS

REFERENCES
3. Special Functions & Complex Variables by Dr. Shahnaz Bathul, PHI learning Pvt. Ltd.
OBJECTIVES: This course aims to give the detailed knowledge of basic devices used in Electronic Circuits and Systems. Mainly emphasizes on construction, working, principle of operation, symbols, equivalent circuits, characteristics, applications of devices like p-n Junction diode, Zener diode, BJT, FET, MOSFET, Tunnel diode, Varactor diode, Schottky Barrier Diode, Semiconductor Photo Diode, Photo Transistor, LED, PIN Diode, UJT, SCR and small signal modeling of BJTs and FETs.

UNIT- I

P-N JUNCTION DIODE, RECTIFIERS AND FILTERS: Qualitative Theory of p-n Junction, p-n Junction as a Diode, Diode Equation, Volt-Ampere characteristics, Temperature dependence of V-I characteristics, Ideal versus practical -Resistance levels(Static & Dynamic), Transition and Diffusion Capacitances, Diode Equivalent circuits, Hall effect, Load Line Analysis, Breakdown Mechanism in Semiconductor Diodes, Zener Diode Characteristics.

P-n junction as a Rectifier, Half wave Rectifier, Full Wave Rectifier, Bridge rectifier, Harmonic components in a Rectifier circuit, Inductor Filters, Capacitor Filters, L-Section Filters, π Section filters, Comparison of Filters, Voltage Regulation using Zener Diode.

UNIT- II


Operating Point, The DC and AC Load lines, Need for Biasing, Fixed Bias, Collector Feedback Bias, Emitter Feedback Bias, Collector-Emitter Feedback bias, Voltage Divider Bias, Bias Stability, Stabilization Factors, Stabilization against variations in $V_{BE}$ and $\beta$, Bias Compensation using Diodes and Transistors, Thermal Runaway, Thermal Stability.

UNIT- III

SMALL SIGNAL LOW FREQUENCY BJT MODELS: BJT Hybrid Model, Determination of h-parameters from Transistor Characteristics, Analysis of Transistor Amplifier using h-Parameters, Comparison of CB, CE and CC Amplifier Configurations.
UNIT- IV

FIELD EFFECT TRANSISTOR AND FET AMPLIFIERS: The Junction Field Effect Transistor (Construction, principle of operation, symbol), Pinch-off Voltage, Volt-Ampere characteristics, Differences between JFET & MOSFET, MOSFET (Construction, principle of operation, symbol), MOSEFT Characteristics in Enhancement & Depletion modes, differences between EMOSFET & DMOSFET.

FET Biasing (Fixed bias, Self Bias, Voltage Divider Bias & Feedback Bias), JFET Small Signal Model, Analysis of Common Source Amplifier, Common Drain amplifier, Generalized FET amplifier, FET as Voltage Variable Resistor, Comparison of BJT & FET.

UNIT - V

SPECIAL PURPOSE ELECTRONIC DEVICES: Principle of Operation and Characteristics of Tunnel Diode (with help of Energy Band Diagram) and Varactor Diode, Principle of Operation of Schottky Barrier Diode, Semiconductor Photo Diode, Photo Transistor, LED, PIN Diode, UJT, SCR.

OUTCOMES:
The completion of the course enables to understand construction, working, symbols, principle of operation, characteristics, modeling and applications of most important electronic devices of Electronic circuits and Systems.

TEXT BOOKS
3. Introduction to Electronic Devices and Circuits –Rober T.Paynter,PE.

REFERENCES
2. Electronic Devices and Circuits-K.lal Kishore, 2nd ed, 2005, BSP.
OBJECTIVES: This course enables to clearly understand the necessary basic concepts of electrical engineering, which helps in analyzing the behavior of devices like filters, attenuators and basic electrical generators and motors and their applications.

UNIT - I
TRANSIENT ANALYSIS AND TWO PORT NETWORKS: Transient response of RL, RC series, RLC Circuits for different excitations like DC and sinusoidal excitations, Initial conditions, Solution using differential equations approach and Laplace transform method.

Impedance parameters, Admittance parameters, Hybrid parameters, Transmission (ABCD) parameters, Conversion of one parameter to another, Conditions for Reciprocity and Symmetry, Interconnection of two port networks in series, parallel and cascaded configurations, Image parameters and characteristic Impedance, Illustrative problems.

UNIT - II
FILTERS AND ATTENUATORS: Classification of Filters, Filter Networks, Classification of Pass band and Stop band, Characteristic Impedance in the pass and stop bands, Constant-k Low Pass and High pass filters, m-derived T-section and δ sections, Band pass filter and Band Elimination filter, Illustrative Problems.

Symmetrical Attenuators – T-Type Attenuator, δ Type Attenuator, Bridged T type Attenuator, Lattice attenuator.

UNIT - III
DC MACHINES: Principle of Operation of DC Machines, Constructional features, EMF equation, Types of Generators, Magnetization and load characteristics of DC Generators.

DC motors, Types of DC Motors, Characteristics of DC Motors, Losses and Efficiency, Swinburne’s Test, Speed control of DC Shunt and series Motors, Flux and Armature voltage control methods.

UNIT - IV
UNIT - V

SINGLE PHASE INDUCTION MOTORS: Concept of rotating field, Principle of Operation, shaded pole motors, Capacitor motors, AC Tachometers, Stepper Motors.

OUTCOMES:
Students will be able to analyze and estimate the behavior of any electrical circuit/machine and the appropriate application for it.

TEXT BOOKS

REFERENCES
1. Networks, Lines and Fields – John D.Ryder, 2ed. 2008 (Reprint), PHI.
5. Electric Circuits- Nilsson, Riedel, 8 ed., PE.
OBJECTIVES: Prepare the students to understand various continuous time signals and systems. Emphasis on the concept and methods that are necessary for analysis of continuous time signals and systems. Students are made more familiar with different types of transformation and their properties which include Fourier Transform and Laplace Transforms. Additional insight into various applications of signals and systems in different fields.

UNIT - I
SIGNAL ANALYSIS: Analogy between Vectors and Signals, Orthogonal Signal Space, Signal approximation using Orthogonal functions. Mean Square Error, Closed or complete set of Orthogonal functions, Orthogonality in Complex functions, Classification of Signals, Exponential and Sinusoidal signals, Concepts of Impulse function, Unit Step function, Signum function.

UNIT - II

UNIT - III
SIGNAL TRANSMISSION THROUGH LINEAR SYSTEMS: Linear System, Impulse response, Response of a Linear System, Linear Time Invariant (LTI) System, Linear Time Variant (LTV) System, Transfer function of a LTI system, Filter characteristics of Linear Systems, Distortionless transmission through a system, Signal bandwidth, System bandwidth, Ideal LPF, HPF and BPF characteristics, Causality and Paley-Wiener criterion for physical realization.

UNIT - IV
CONVOLUTION AND CORRELATION OF SIGNALS: Concept of convolution in Time domain and Frequency domain. Graphical representation of Convolution, Convolution property of Fourier Transform, Cross Correlation and Auto Correlation of functions, Properties of Correlation function, Relation between Convolution and Correlation, Detection of periodic signals in the presence of Noise by Correlation, Extraction of signal from noise by filtering. Energy
density spectrum, Parseval’s Theorem, Power density spectrum, Relation between Auto Correlation function and Energy/Power spectral density function, Properties of ESD, Properties of PSD.

UNIT - V

SAMPLING AND LAPLACE TRANSFORMS: Sampling theorem - Graphical and analytical proof for Band Limited Signals, Impulse Sampling, Natural and Flat top Sampling, Reconstruction of signal from its samples, Effect of under sampling - Aliasing, Introduction to Band Pass samplings


OUTCOMES: On successful completion of this course students will understand the concept of signal and system classifications and their properties. Students will understand the concepts of Fourier representation of analog signals and learns about different forms and properties of Fourier transforms., Students will understand the concept of frequency response in analog systems. Students will understand the concept of impulse response and convolution. Students will understand the concept of sampling and reconstruction of analog signals. Students will understand the concept of Laplace transform and its applications in analysis of linear and time-invariant analog systems.

TEXT BOOKS

1. Signals, Systems & Communications - B.P. Lathi, 2009, BSP.

REFERENCES

1. Signals and Systems -A.Anand kumar - 2011, PHI learning Pvt..
BASIC SIMULATION LAB
(Common to ECE, ETM, ICE)

II Year B.Tech I Semester  L  T/P/D  C
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OBJECTIVES: Introduces the students to the basics of MATLAB software. To generate and analyze various Signals such as UNIT Impulse, UNIT Step, Square, Saw tooth, Triangular, Sinusoidal, Ramp, and Sine. To find convolution and correlation between the signals using MATLAB software, To Generate Gaussian noise, Computation of its mean, M.S. Value and its Skew, Kurtosis, PSD, PDF and Removal of noise by Autocorrelation / Cross correlation.

LIST OF EXPERIMENTS:
(Minimum of 12 experiments to be performed)

1. Basic Operations on Matrices.
2. Generation of Various Signals such as UNIT Impulse, UNIT Step, Square, Saw tooth, Triangular, Sinusoidal, Ramp, Sine.
3. Operations on Signals such as Addition, Multiplication, Scaling, Shifting, Folding and Computation of Energy and Average Power.
4. Finding the Even and Odd parts of Signal and Real and Imaginary parts of Signal.
5. Convolution between Signals.
6. Auto Correlation and Cross Correlation between Signals.
7. Verification of Linearity and Time Invariance Properties of a given System.
8. Computation of UNIT sample, UNIT step and sinusoidal responses of the given LTI system and verifying its physical realizability and stability properties.
9. Gibbs Phenomenon
10. Finding the Fourier Transform of a given signal and plotting its magnitude and phase spectrum.
12. Locating the Zeros and Poles and plotting the Pole-Zero maps in S-plane for the given transfer function.
17. Verification of Weiner-Khinchine Relations.

OUTCOMES: At the end of the course, students will be able to understand the different types of signals and the methods of generating them using MATLAB software. They will be able to demonstrate the importance of convolution and correlation by applying it to solve the radar target detection problem. They will be capable to understand the characterization of random signals in statistical terms and explains the concept and relevance of noise in signal processing applications.
OBJECTIVES: To give the students introduction about Discrete components (linear and nonlinear), Breadboards, CRO’s, Multimeters, Signal generators etc. and make them to identify the different components. Students are trained to design different circuits using Diodes, BJT, FETs etc. for various applications.

PART A: (ONLY FOR VIVA-VOCE EXAMINATION)

ELECTRONIC WORKSHOP PRACTICE (in 3 lab sessions):
1. Identification, Specifications, Testing of R, L, C Components (Color Codes), Potentiometers, switches (SPDT, DPDT, and DIP), Coils, Gang Condensers, Relays, Bread Boards, PCB’s
2. Identification, Specifications and Testing of Active Devices, Diodes, BJT’s, Low power JFET’s, MOSFET’s, Power Transistors, LED’s, LCD’s, SCR, UJT.
3. Study and operation of
   - Multimeters (Analog and Digital)
   - Function Generator
   - Regulated Power Supplies
   - CRO.

PART B: (FOR LABORATORY EXAMINATION - MINIMUM OF 10 EXPERIMENTS)
1. Forward & Reverse Bias Characteristics of PN Junction Diode.
2. Zener diode characteristics and Zener as voltage Regulator.
3. Input & Output Characteristics of Transistor in CB Configuration.
4. Input & Output Characteristics of Transistor in CE Configuration.
5. Half Wave Rectifier with & without filters
6. Full Wave Rectifier with & without filters
7. FET characteristics
8. Measurement of h parameters of transistor in CB, CE, CC configurations
11. Frequency Response of Common Source FET amplifier
12. SCR characteristics.
13. UJT Characteristics
PART C:

EQUIPMENT REQUIRED FOR LABORATORIES:

1. Regulated Power supplies (RPS) - 0-30V
2. CRO’s - 0-20MHZ
3. Function Generators - 0-1 MHz.
4. Multimeters
5. Decade Resistance Boxes/Rheostats
6. Decade Capacitance Boxes
7. Ammeters (Analog or Digital) - 0-20uA, 0-50uA, 0-100uA, 0-200 |uA, 0-10 mA.
8. Voltmeters (Analog or Digital) - 0-50V, 0-100V, 0-250V
9. Electronic Components - Resistors, Capacitors, LCDs, BJTs pnp & npn, SCRs, UJTs, FETs, MOSFETs, diodes- Ge & Si

OUTCOMES: Students can identify different components and can operate them properly and also can design different circuits using different components and devices for various applications.
ELECTRICAL ENGINEERING LAB
(Common to ECE, ETM)
II Year B.Tech I Semester

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PART-A

The following experiments are to be conducted compulsory
1. Time response of first order RC/RL network for Periodic non-sinusoidal inputs – time constant and steady state error determination.
2. Two port network parameters – Z,Y parameters, analytical verification.
3. Two port network parameters – ABCD and h-parameters
5. Magnetization characteristic of DC shunt generator, Determination of critical field resistance
6. Swinburne’s Test on DC shunt machine.
8. OC & SC tests on single –phase transformer.

PART-B

Any Two of the following experiments are to be conducted
9. Load Test on Single Phase Transformer.
10. Load Test on Single Phase Induction motor.
11. Separation of losses of a DC Machine
12. Speed control of DC Motor
SWITCHING THEORY AND LOGIC DESIGN (STLD)
(Common to ECE, ETM, ICE)

II Year B.Tech II Semester

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OBJECTIVES: To strengthen the students on Number systems and Codes, Boolean algebra and Switching Functions, Karnaugh Map, Logic Gates, Minimization of Switching Functions using Tabular Method, Combinational logic design using conventional logic gates, Encoder, Decoder, Mux and Demux, Realization of Hazard free circuits, Programmable Logic devices, Sequential circuits classification, Flip flops, Finite state machines and Algorithmic state machines.

UNIT - I


BOOLEAN ALGEBRA, SWITCHING FUNCTIONS: Fundamental postulates of Boolean algebra, Basic theorems and properties, Algebraic simplification -switching functions–Canonical and Minimal SOP and POS forms.

UNIT - II

MINIMIZATION OF SWITCHING FUNCTIONS: Karnaugh Map (K-Map) method, Implicants, Prime implicants, Essential Prime implicants, don’t care combinations - Tabular Method, Prime –Implicant chart, simplification rules.


UNIT - III

COMBINATIONAL CIRCUITS-II: Encoder, Decoder, Multiplexer, De-Multiplexer, Modular design using IC chips, MUX Realization of switching functions, Parity bit generator, Code-converters, Hazards and hazard free realizations.

PROGRAMMABLE LOGIC DEVICES: Basic PLD’s-ROM, PROM, PLA, PAL, and Realization of Switching functions using PLD’s.

UNIT - IV

SEQUENTIAL CIRCUITS - I: Combinational versus sequential circuits, Classification of sequential circuits: Synchronous, Asynchronous, Pulse mode, Level mode with examples. Basic flip-flops (SR, JK, T, D) -Triggering
and excitation tables of flip-flops, conversion among different flip-flops.
Steps in synchronous sequential circuit design. Classification of Counters
(Synchronous and Asynchronous counters), Design of modulo-N
synchronous binary, gray, BCD, excess-3, bi-directional and universal shift
registers, Shift register counters(Ring and Johnson counters) Serial binary
adder, sequence detector.

UNIT - V

SEQUENTIAL CIRCUITS - II : Finite state machine-capabilities and limitations,
Mealy and Moore models-minimization of completely specified and
incompletely specified sequential machines, Partition techniques and
Merger chart methods-concept of minimal cover table.

ALGORITHMIC STATE MACHINES : Salient features of the ASM chart-Simple
examples-System design using data path and control subsystems-control
implementations-examples of Weighing machine and Binary multiplier.

OUTCOMES : At the end of the course, students will be able to convert a
number from one number system to the other number systems. Perform
the three basic logic operations and construct the truth tables for the
different types of gates. Implement logic circuits using basic AND, OR and
NOT gates and universal logic gates. Design combinational circuits and
sequential circuits. Analyze and minimize Finite State Machines.

TEXTBOOKS:

REFERENCES:
2. An Engineering Approach to Digital Design – Fletcher, PHI. Digital Logic
   – Application and Design – John M. Yarbrough, Thomson.
3. Fundamentals of Logic Design – Charles H. Roth, Thomson Publications,
4. Digital Logic Applications and Design – John M. Yarbrough, Thomson
ELECTRONIC CIRCUIT ANALYSIS  
(Common to ETM, ECE, ICE)

II Year B.Tech II Semester  
L T/P/D C  
4 1/-/- 4

OBJECTIVES: To develop knowledge on operating principles of analog electronic circuits like amplifiers, power amplifiers, tuned amplifiers. To provide students with a solid foundation in analyzing techniques like calculation of given input impedance, output impedance, bandwidth of analog electronic circuits. To train the students to design the models to meet the application in the areas of analog electronics. To prepare students to excel in analysis of electronic circuits, and introduce circuits software simulation tool.

UNIT- I


UNIT- II


MOSFET AMPLIFIERS: MOS Small signal model, common source amplifier with resistive load, Diode connected Load and Current Source Load, Source follower, Common Gate stage.

UNIT- III


UNIT-IV

LARGE SIGNAL AMPLIFIERS: Classification, Distortion in Amplifiers, Power amplifiers as large signal amplifiers, differences between Voltage amplifiers & power amplifiers, Significance of Transformer used as a load, Class A Large Signal Amplifiers, Transformer Coupled Class A Audio Power Amplifier, Efficiency of Class A Amplifier, Push-Pull amplifiers, Class B Transformer coupled Push-Pull power amplifier and its efficiency, Class B transformer less Push-Pull amplifiers. Cross Over distortion, Class AB transformer coupled Push-Pull power amplifier, Complementary Symmetry Class B Push-Pull Amplifier, Class C operation, Thermal Stability and Heat Sinks.

UNIT-V


OUTCOMES: Students will understand the basic characteristics of a generic amplifier such as the input and output impedances, current and voltage gain, and frequency response, will demonstrate the comparison of various types of amplifiers such as voltage, current, power and tuned amplifiers, will be able to identify the difference between large-signal and low-frequency small-signal model of a BJT/FET and the limitations of the models, will demonstrate an ability to analyze and design an amplifier as per needs and specifications, will demonstrate skills to use, software and hard module to analyze problems and students who can participate and succeed in competitive examinations related to ECE stream.

TEXTBOOKS

2. Electronic Devices and Circuits - S. Salivahanan, N.Suresh Kumar, A Vallavaraj, 2 ed., 2009, TMH.
REFERENCES

PULSE AND DIGITAL CIRCUITS
(Common to ECE, ETM, ICE)

II Year B.Tech II Semester

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OBJECTIVES: This course aims to enrich the knowledge of wave shaping, understand the concepts of switching, non-regenerative and regenerative comparators. Emphasis on design procedures and analysis of multivibrators is laid in this course. The course constitutes the foundation of various concepts of Time Base generators, Principles of Synchronization, Sampling gates and Logic Gates.

UNIT- I
LINEAR WAVE SHAPING: High pass, low pass RC circuits and their response for sinusoidal, step, pulse, square and ramp inputs. High pass RC network as differentiator, Low pass RC circuit as integrator, attenuators, its applications as a CRO probe, RL and RLC circuits and their response for step input, Ringing circuit.

NON-LINEAR WAVE SHAPING (PART I): Diode clippers, Transistor clippers, clipping at two independent levels.

UNIT-II
NON-LINEAR WAVE SHAPING (PART II): Comparators, applications of voltage comparators, clamping operation, clamping circuit taking source and diode resistances into account, Clamping circuit theorem, practical clamping circuits, effect of diode characteristics on clamping voltage, Synchronized clamping.

SWITCHING CHARACTERISTICS OF DEVICES: Diode as a switch, piecewise linear diode characteristics, Diode switching times, Transistor as a switch, Break down voltages, Transistor in saturation, Temperature variation of saturation parameters, Transistor-switching times, silicon –controlled-switch circuits.

UNIT - III
MULTIVIBRATORS: Multivibrators (using BJT’s): The Bistable Multivibrator: Fixed bias and Self bias transistor binary stable state voltages and currents, Design of Fixed bias and Self Bias Binary, Commutating Capacitors, Symmetrical and Unsymmetrical Triggering, Direct Coupled Binary.

Analysis and Design of Schmitt trigger circuit, Monostable Multivibrator (collector coupled only), Analysis and Design of Astable Multivibrator (collector coupled only) and Applications of Multivibrators.
UNIT - IV

TIME BASE GENERATORS: General features of a Time Base signal, methods of generating Time Base waveform, Miller and Bootstrap Time Base generators - basic principles, Transistor Miller Time Base generator, Transistor Bootstrap Time Base generator, transistor Current Time Base generators, methods of linearity improvement.


UNIT -

SAMPLING GATES: Basic operating principles of Sampling Gates, Unidirectional and Bi-directional Sampling Gates, four diode Sampling Gate, Reduction of pedestal in gate circuits, six diode Gate, Applications of Sampling Gates.

REALIZATION OF LOGIC GATES USING DIODES & TRANSISTORS: AND, OR and NOT gates using Diodes & Transistors, DCTL, RTL, DTL, TTL and CML Logic families and its comparison.

OUTCOMES: The completion of course enables to understand the basics of Wave shaping, differentiate and understand the operation of various Multi vibrators, demonstrate basic knowledge of Time Base generators, Principles of Synchronization, Sampling gates and Logic Gates.

TEXT BOOKS:

REFERENCES:
1. Solid State Pulse circuits - David A. Bell, PHI, 4th Edn., 2002
OBJECTIVES: To give the students introductory background about concepts of probability, random variable, random signal principles and noise. To develop the abilities among the students to model any practical application events and to compute standard distributions and density functions. To facilitate them to identify a random signal, obtain the mean, autocorrelation and covariance functions of random processes and then to identify a stationary and wide sense stationary random process. To give them the concepts of LTI systems and to find the system response of a linear system to a random process and to model resistive noise sources for testing the performance of different systems. To fortify them to apply all concepts of the course in multi dimensional mode.

UNIT - I


UNIT - II

UNIT - III


UNIT - IV


UNIT - V


OUTCOMES: At the end of this course, the students will be able to apply the knowledge of probability, random variables and random processes gained in this course to several different types of problems in engineering. Students will be able to model any type of random experiment into mathematical model. Compute probability distributions for the parameters of various systems, to estimate average values and variances of these parameters, Identify a random signal, obtain the mean, autocorrelation, covariance functions of random processes a stationary and wide sense
stationary random process., Find the response of a linear filter to a random process. Analyze communication systems for statistical parameters like signal to noise ratio, probability of error.

**TEXTBOOKS**


**REFERENCES**

CONTROL SYSTEMS
(Common to ECE, ETM, EEE, ICE)

II Year B.Tech II Semester

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OBJECTIVES: To give the students an introduction to the analysis of linear control systems. This permits the students to exploit time and frequency domain tools to design and study the linear control systems.

UNIT-I

INTRODUCTION: Concepts of Control Systems - Open Loop and closed loop control systems and their differences - Different examples of control systems - Classification of control systems, Feed-Back Characteristics, Effects of feedback.

Mathematical models - Differential equations, Impulse Response and transfer functions - Translational and Rotational mechanical systems

UNIT-II

TRANSFER FUNCTION REPRESENTATION: Transfer Function of DC Servo motor - AC Servo motor - Synchro transmitter and Receiver, Block diagram representation of systems considering electrical systems as examples - Block diagram algebra - Representation by Signal flow graph - Reduction using Mason's gain formula.

UNIT-III


The concept of stability - Routh's stability criterion - Qualitative stability and conditional stability - Limitations of Routh's stability. Root Locus Technique: The Root locus concept - Construction of root loci - Effects of adding poles and zeros to G(s)H(s) on the root loci.

UNIT-IV

FREQUENCY RESPONSE & STABILITY ANALYSIS: Introduction, Frequency domain specifications - Bode diagrams - Determination of Frequency domain specifications and transfer function from the Bode Diagram - Phase margin and Gain margin - Stability Analysis from Bode Plots. Polar Plots, Nyquist Plots - Stability Analysis.

Compensation techniques - Lag, Lead and Lead-Lag Controllers design in frequency Domain, PID Controllers.
UNIT - V

STATE SPACE ANALYSIS OF CONTINUOUS SYSTEMS: Concepts of state, State variables and State model, Derivation of state models from block diagrams, Diagonalization - Solving the Time invariant state Equations - State Transition Matrix and it’s Properties - Concepts of Controllability and Observability.

OUTCOMES: Upon successful completion of this course, students will be able to describe the feedback control and the basic components of control systems, analyze various time and frequency domain methodologies for the design of linear control systems, examine the methods of stability analysis of systems from transfer function forms and to develop the state space models for various systems.

TEXT BOOKS:

REFERENCES:
ELECTRO MAGNETIC THEORY

II Year B.Tech II Semester

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COURSE OBJECTIVES:

- This course covers the fundamentals of applied electromagnetics by emphasizing physical understanding & practical applications in Electronics & Telematics.
- Prepare the students to understand the basic concepts of electromagnetics and parameters necessary for analysis and design of EM systems.
- Provide the students with mathematical & scientific skills relevant to EM systems to solve the engineering problems and to pursue higher studies.
- Train the students to understand basic analysis techniques needed when formulating and solving EM Problems.
- A broad outlook and contribution of EM to other fields of engineering like electrical, computer, agriculture, medical and communication engineering.
- An understanding of how to bridge gap between the concepts of electric circuits and concept of EM are presented.
- Students are made to understand and analyze static electric and magnetic fields, time varying electric and magnetic fields.

UNIT - I

ELECTROSTATICS-I: Introduction, Coordinate systems-Rectangular, Cylindrical and Spherical, transformation between coordinate systems, review of vector algebra-dot and cross product.


UNIT - II

ELECTROSTATICS-II: Convection and Conduction Currents, Dielectric Constant, Isotropic and Homogeneous Dielectrics, Continuity Equation, Relaxation Time, Poisson’s and Laplace’s Equations, application - Capacitance - Parallel Plate, Coaxial, Spherical Capacitors, Boundary conditions, Illustrative Problems.

UNIT - III

MAGNETOSTATICS: Biot-Savart Law, Ampere’s Circuital Law and Applications, Magnetic Flux Density, Maxwell’s Two Equations for


UNIT - V


COURSE OUTCOMES:

- Students will exhibit knowledge about static and magnetic fields.
- Students will demonstrate an ability to apply Gauss law, Ampere law, Biot – Sarvart Law, Faraday’s Law and Maxwell’s Equation in the analysis of EM Systems.
- Students are able to apply EM boundary conditions to solve electric field at the interface between two different media.

TEXT BOOKS:


REFERENCES:

ELECTRONIC CIRCUIT ANALYSIS LAB  
(Common to ECE, ETM)

II Year B.Tech II Semester  
L  T/P/D  C  
/-/3/-  2

OBJECTIVES: To design the single stage and multi stage amplifiers, the Power amplifiers using power transistors for the required output power, the single tuned and double tuned amplifier circuit for the given resonant frequency and to develop necessary skills to function effectively on teams, in technical writing in effective communication.

LIST OF EXPERIMENTS (TWELVE EXPERIMENTS TO BE DONE):

I) Design and Simulation in Simulation Laboratory using any Simulation Software. (Any Six):
1. Common Emitter
2. Common Source amplifier
3. Two Stage RC Coupled Amplifier
4. Current shunt and voltage series Feedback Amplifier
5. Cascode Amplifier
6. Wien Bridge Oscillator using Transistors
7. RC Phase Shift Oscillator using Transistors
8. Class A Power Amplifier (Transformer less)
9. Class B Complementary Symmetry Amplifier

II) Testing in the Hardware Laboratory (Six Experiments: (3 + 3):
A) Any Three circuits simulated in Simulation laboratory
B) Any Three of the following
1. Class A Power Amplifier (with transformer load)
2. Class C Power Amplifier
3. Single Tuned Voltage Amplifier
4. Hartley & Colpitts Oscillators
5. Darlington Pair
6. MOS Amplifier

Equipments required for Laboratories:
1. For software simulation of Electronic circuits
   i) Computer Systems with latest specifications
   ii) Connected in LAN (Optional)
iii) Operating system (Windows XP)
iv) Simulations software (Multisim/TINApro) Package

2. For Hardware simulations of Electronic Circuits
i) RPSs
ii) CROs
iii) Functions Generators
iv) Multimeters
v) Components

OUTCOMES: Students will demonstrate the ability to design, analyze and test single and multi stage amplifiers by using hardware module. Verifying the Design circuit by using software simulation. Measure gain and bandwidth. They will demonstrate the ability to design, analyze oscillator circuits to get sustained oscillation frequency using hardware module and measure frequency of oscillation, to analyze power amplifiers in time domain and frequency domain based on conduction angle and efficiency using software simulation. Design and test the same by hardware module, to analyze tuned amplifiers (single and double) time domain and frequency domain using software simulation. To design and test the same by hardware module also measure gain and bandwidth for tuned frequency and to communicate and share their experiences by working in small team groups.
PULSE AND DIGITAL CIRCUITS LAB
(Common to ECE, ETM)

II Year B.Tech II Semester
L T/P/D C
0 0/-3/- 2

OBJECTIVES:
The objective of the lab is, students will understand the concepts covered in PDC theory i.e., linear/non-linear wave shaping circuits, multi-vibrators, various oscillators, realization of gates by diodes, resistances and transistors.

MINIMUM TWELVE EXPERIMENTS TO BE CONDUCTED:

LIST OF EXPERIMENTS (TEN EXPERIMENTS TO BE DONE):

1. Linear wave shaping.
2. Non Linear wave shaping - Clippers.
3. Non Linear wave shaping - Clampers.
4. Transistor as a switch.
5. Study of Logic Gates & some applications.
6. Study of Flip-Flops & some applications.
7. Sampling Gates.
8. Astable Multivibrator.
12. UJT Relaxation Oscillator.

Equipment required for Laboratories:

1. Regulated Power Supply - 0-30V
2. CRO - 0-20MHz.
3. Function Generators - 0-1 MHz
4. Components
5. Multi Meters

OUTCOMES:
After this lab is completed the students will be able to design linear/non-linear wave shaping circuit for the specified waveform. The students will also be able to understand concepts of multi-vibrators, transistor as switch, UJT as oscillator.
MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS
(Common to ECE & ETM)

III Year B.Tech I Semester

L T/P/D C
4 -/-/- 4

OBJECTIVES: To explain the basic principles of managerial economics, accounting and current business environment underlying business decision making.

UNIT - I


UNIT - II


UNIT - III

INTRODUCTION TO MARKET PRICING METHODS: Market Structures: Types of competition, Features of Markets based on competition, Price-Output determination in case of perfect competition and monopolistic competition.

UNIT-IV


FINAL ACCOUNTS: Introduction to Final Accounts (Trading, Profit & Loss Account and Balance Sheet) Adjustments with Simple Problems. Introduction to Ratio Analysis, Need & Importance of Ratios (Theory only)

UNIT - V

CAPITAL AND CAPITAL BUDGETING: Introduction to Sources of raising finance Nature and scope of capital budgeting, features of capital budgeting proposals, Methods of capital Budgeting, Payback Method, Accounting Rate of Return (ARR) and Net Present Value NPV , Profitability Index(PI), Internal Rate of Return (IRR),(Simple Problems)

OUTCOMES: The candidate would be in a position to understand, analyze and interpret the basics of economics, accounting and that of business environment associated with.

TEXT BOOKS:
1. Managerial Economics and Financial Analysis – A R Aryasri

REFERENCES:
2. Managerial Economics – Varshney & Maheshwari
3. Financial Management Text and problems – Khan & Jain
4. Financial Management – I.M.Pandey
5. Double Entry Book Keeping – T.S. Grewal
COMPUTER ORGANIZATION
(COMMON TO ECE, ETM, CSE, IT)

III Year B.Tech I Semester
L  T/P/D  C
4  1/-/-  4

OBJECTIVES:
To acquire the knowledge of the basic hardware and software issues of computer organization, to analyze the operational concepts of computers data representation, to know about the architecture and the features of advanced processors, to learn hierarchical memory system including cache memories and virtual memory and to acquire the knowledge about computer architecture, machine language, and low-level programming.

UNIT - I
BASIC STRUCTURE OF COMPUTERS:

UNIT - II
REGISTER TRANSFER LANGUAGE AND MICRO OPERATIONS:
Register Transfer language, Register Transfer Bus and Memory Transfers, Arithmetic Micro operations, Logic Micro operations, Shift Micro operations, Arithmetic Logic Shift Unit. Instruction codes, Computer Registers, Computer Instructions - Instruction cycle.
Memory - Reference Instructions, Input - Output and Interrupt, STACK Organization, Instruction Formats, Addressing Modes, DATA Transfer and Manipulation. Program Control, Reduced Instruction Set Computer.

UNIT - III
MICRO PROGRAMMED CONTROL:
Control Memory, Address Sequencing, Micro Program Example, Design of Control Unit, Hard Wired Control, Micro Programmed Control.
COMPUTER ARITHMETIC:

UNIT - IV
MEMORY ORGANIZATION:
Memory Hierarchy, Main Memory, Auxiliary Memory, Cache Memory, Virtual Memory, Introduction to RAID.
INPUT-OUTPUT ORGANIZATION:
Peripheral Devices, Input-Output Interface, Asynchronous Data Transfer, Modes of Transfer, Priority Interrupt, Direct Memory Access, Input - Output Processor (IOP), Serial

UNIT-V

PIPELINE AND VECTOR PROCESSING: Parallel Processing, Pipelining, Arithmetic Pipeline, Instruction Pipeline, RISC Pipeline, Vector Processing, Array Processors.


OUTCOMES: Upon successful completion of this course the student will be able to apply knowledge of computer science and electronics engineering to computer hardware and assembly level programming, design, analyze and interpret data, understand how instruction pipelining enhances processor performance.

TEXT BOOKS:


REFERENCES:


ANALOG & DIGITAL COMMUNICATIONS

COURSE OBJECTIVES:

➢ To understand the basic theories of amplitude modulated, double side band, single side band, vestigial side band modulated signals, identify their spectrums and their applications
➢ Analyze the angle modulated signals viz phase and frequency modulated signals and their spectrums Understand the effects of noise in communication systems and their applications
➢ Obtain a Pulse Code Modulated signal, compute signal-to quantization noise ratios for uniform and non uniform quantizers.
➢ Design a coherent receiver for a specified signaling scheme including a description of the optimum matched filter, timing information, threshold settings, etc.
➢ To understand and apply the concepts of source and channel coding.
➢ Visualize the comparison of different digital modulation schemes using simulation tools.

UNIT - I

AMPLITUDE MODULATION : Need for Modulation,

AMPLITUDE MODULATION: Time & frequency domain analysis, Power relations in AM, generation of AM: square law & switching modulator, Detection of AM: Envelop detector, square law detector.

DSBSC MODULATION: Time and frequency domain description, balanced modulator, Ring modulator coherent detection of DSBSC modulated wave.

SSB MODULATION : Time and frequency domain analysis of SSB modulated wave, generation of SSB using frequency discrimination method and phase discrimination method, Demodulation of SSB wave. comparison & applications of AM systems, TRF & Super heterodyne Receiver, choice of IF.

UNIT - II


NOISE IN ANALOG COMMUNICATION SYSTEMS: Noise in AM System, Noise in DSBSC systems, Noise in SSB system, Noise in FM, pre-emphasis and de-emphasis

UNIT-III

PULSE MODULATION TECHNIQUES : Pulse Amplitude Modulation, Pulse
Width Modulation, Pulse Position Modulation, Pulse Code Modulation, Quantization noise, SNR in PCM, Robust Quantization, Differential Pulse Code Modulation, Delta Modulation, SNR In DM.

UNIT - IV

DIGITAL MODULATION TECHNIQUES: Digital modulation formats, BPSK, coherent binary FSK, QPSK, non coherent binary FSK, DPSK, comparison. M-ary PSK, power spectra of BPSK & FSK signals, Bandwidth efficiency of M-ary PSK, M-ary FSK signals.

UNIT - V

INFORMATION THEORY: Discrete Messages, concept of amount of information and its properties, Average information, Entropy and its properties, Information rate, mutual information and properties, channel capacity of a Gaussian channel, source coding theorem, Shannon Fano coding, Huffman coding.

CHANNEL CODING: Linear block codes, Binary cyclic codes, convolutional codes.

COURSE OUTCOMES:

➢ To familiarize students with various techniques for amplitude modulated, double side band, SSB, VSB modulated signals, identify their spectrums, derive relationships.

➢ To develop students, ability to determine the effects of receiver frequency and phase errors in synchronous modulation systems.

➢ To familiarize students with techniques for generating and demodulating narrow band and wide band frequency and phase modulated signals.

➢ Determine the no. of levels in a quantizer given signal to noise ratio and maximum input voltage.

➢ Determine the use of controlled inter symbol interference to achieve maximum data rates.

TEXT BOOKS:


REFERENCE BOOKS:

OBJECTIVES:
- To strengthen the basic concepts in IC’s design and its applications.
- To introduce basic building blocks of analog and digital integrated circuits.
- To familiarize linear and non-linear applications of op-amp.
- To study about functioning of IC 555 timer, PLL, ADC and DAC converters and their applications.
- To introduce the analysis and design of digital IC’s of 74 series which form core part of digital electronics.

UNIT - I


UNIT - II


UNIT - III
PHASE LOCKED LOOPS: PLL- Introduction, Block Schematic, Principles and Description of Individual Blocks of 565, VCO.

D-A AND A-D CONVERTERS: Introduction, Basic DAC Techniques - Weighted Resistor Type, R-2R Ladder Type, Inverted R-2R Type. Different types of ADCs – Parallel Comparator Type, Counter Type, Successive Approximation Register Type and Dual Slope Type. DAC and ADC specifications.
UNIT - IV

LOGIC FAMILIES: Classification of Integrated Circuits, Standard TTL NAND Gate - Analysis & Characteristics, TTL Open Collector Outputs, Tristate TTL, MOS & CMOS open drain and tristate outputs, Comparison of Various Logic Families, IC interfacing- TTL driving CMOS & CMOS driving TTL.

UNIT - V

COMBINATIONAL CIRCUIT ICS: Use of TTL-74XX Series & CMOS 40XX Series ICs, TTL ICs – Code Converters, Decoders, Demultiplexers, Encoders, Priority Encoders, multiplexers & their applications, Priority Generators, Arithmetic Circuit ICs-Parallel Binary Adder/ Subtractor Using 2’s Complement System, Magnitude Comparator Circuits.

SEQUENTIAL CIRCUIT ICS: Commonly Available 74XX & CMOS 40XX Series ICs - RS, JK, JK Master-Slave, D and T Type Flip-Flops & their Conversions, Synchronous and Asynchronous counters, Decade counters, Shift Registers & applications.

OUTCOMES:
- Students will develop the ability to design the analog circuits using op-amps for various applications.
- Students will demonstrate their skills in designing waveform generation circuits using op-amps.
- Students will demonstrate their skills in analyzing 555 timer, PLL and its applications.
- Students will be able to design logic circuits using digital IC’s.
- Students will develop the ability to design and analyze various combinational and sequential circuits using IC 74 series.

TEXT BOOKS:

REFERENCES:
DIGITAL SIGNAL PROCESSING
(Common to ECE, ETM)

III Year B.Tech I Semester

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OBJECTIVES:

- Prepare the students to understand various discrete time signal & System. Emphasis on the concept and methods that are necessary for analysis of discrete time signals and systems.
- To provide students with solid foundation in Discrete Fourier Transform and Fast Fourier Transform required to solve signal processing problems.
- Students are trained to analyze the frequency spectrum of different discrete time signal using DSP Processors and software tool.
- Students are made more familiar with design of IIR and FIR filter and their realization.

UNIT - I

INTRODUCTION: Introduction to Digital Signal Processing, Elementary Discrete time signals, Discrete time systems, properties of discrete time systems, Linear constant coefficient difference equations, Frequency domain representation of discrete time signals and systems.

UNIT - II

Z-TRANSFORM: Z-Transform of a discrete sequence, Distinction between Laplace and Z transforms. Region of convergence in Z-Transform, constraints on ROC for various classes of signals, properties of Z-transforms, one sided Z-transform, application-solution to difference equation, Inverse Z-transform-contour integration, power series expansion and partial fraction method.

DISCRETE TIME FOURIER SERIES AND TRANSFORM: Representation of Periodic Sequences (DFS), Properties of Discrete Fourier Series, Discrete Time Fourier Transform (DTFT) of aperiodic sequence, properties of DTFT.

UNIT - III


FAST FOURIER TRANSFORM: Fast Fourier transforms (FFT) - Radix-2 decimation-in-time and decimation-in-frequency FFT Algorithms, Inverse FFT and FFT with general Radix-N.
UNIT - IV


REALIZATION OF IIR FILTERS: Direct form, signal flow graphs and transposed structure, Cascade and Parallel forms, Lattice-Ladder structure.

UNIT - V


REALIZATION OF FIR FILTERS: Direct form, Cascaded form, Linear Phase, Poly Phase and Lattice structures.

OUTCOMES:

➢ Students will demonstrate an ability to identify different types of discrete time signals & systems.
➢ Students will analyze the discrete time signals using Z-Transform, DFT/FFT.
➢ Students will demonstrate an ability to design and implement FIR and IIR filter.

TEXT BOOKS:


REFERENCES:

DIGITAL SIGNAL PROCESSING LAB
(Common to ECE & ETM)

III Year B.Tech I Semester

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OBJECTIVES: The main objective of this lab is to gain the practical hands-on experience by exposing the students to various digital signal processing techniques. The various signal processing operations such as linear convolutions and circular convolution and the design of various filters.

The programs shall be implemented in software (Using MATLAB / Lab view / C programming/ OCTAVE or Equivalent) and hardware (Using TI / Analog devices / Motorola / Equivalent DSP processors).

1. Linear Convolution & Circular Convolution
2. Impulse response of first order and second order systems.
3. To find Z-Transform of a given sequence and to locate the zeros and poles.
4. To find DFT / IDFT of given DT signal
5. To find response of a system given its Transfer Function or Differential equation form.
6. Implementation of FFT of given sequence
7. Determination of Power Spectrum of a given signal(s).
8. Implementation of LP FIR filter for a given sequence.
9. Implementation of HP FIR filter for a given sequence.
10. Implementation of LP IIR filter for a given sequence.
11. Implementation of HP IIR filter for a given sequence.
12. Generation of DTMF signals
13. Implementation of Decimation Process
14. Implementation of Interpolation Process
15. Implementation of I/D sampling rate converters
16. Audio application such as to plot a time and frequency display of microphone plus a cosine using DSP. Read a.wav file and match with their respective spectrograms.
17. Noise removal: Add noise above 3 KHz and then remove, interference suppression using 400 Hz tone.

OUTCOMES: By the end of the course, students should be able to use the Fast Fourier Transform and Discrete Fourier Transform in various applications, perform the convolution of two signals, estimate power spectral densities, quickly choose and design filters.
ANALOG & DIGITAL COMMUNICATIONS LAB

III Year B.Tech  I-Semester

COURSE OBJECTIVES:
- To explore the temporal characteristics of the various linear and nonlinear modulated signals
- To explore the spectral characteristics of various modulated signals
- To conduct test basis detector circuits for various modulated signals
- To study sampling theorem
- To generate and study pulse modulation techniques
- To generate and study generation of digital signals from analog data
- To generate and study generation of digital signals from analog data
- To generate and study digital carrier modulation techniques.

Any four of these experiments are to be simulated either using Commsim, MATLAB, SCILAB or any other simulation package.

(Minimum of 10 experiments to be performed)

1. Amplitude Modulation & Demodulation
2. Frequency Modulation & Demodulation
3. Balanced Modulator
4. SSB System
5. Pre Emphasis & De emphasis
6. Synchronous detector
7. Phase locked loop as FM Demodulator
8. Sampling Theorem
9. Pulse Code Modulation
10. Differential Pulse Code Modulation
11. Delta Modulation
12. Phase Shift Keying
13. Differential Phase Shift Keying
14. Frequency Shift Keying
15. Time Division Multiplexing

COURSE OUTCOMES:
- The students will demonstrate the ability to analyze & test the circuits for generation of AM, DSBSC SSB & FM signals for tone modulation and obtain the modulation index.
The students will demonstrate the ability to use the spectrum analyzer for spectral analysis of AM/FM signals and find the bandwidth of single tone AM signal.

The students will demonstrate the ability to construct circuits for detecting AM signals, coherent detectors for DSBSC, SSB signals. To study the significance of depth of modulation in envelop detections, constraints on time constants of the circuit of deviation of carrier frequency at receiver on demodulated signal in coherent receiver.

The students can demonstrate the generation of a signal discrete in time domain from a continuous analog signal and study the effects of sampling frequency on demonstrated signal.

The students can demonstrate the ability to generate and analyze the relationship if any between different pulse modulation techniques like PAM, PWM, PPM.

The students can obtain and analyze a signal discrete in amplitude i.e quantized signal via uniform quantization.

The student can demonstrate the generation of digital carrier modulation techniques like ASK, PSK, FSK and demodulation of them.
OBJECTIVES: The main objective of this lab course is to gain the practical hands on experience by exposing the students to various linear and digital IC applications. The students will have an understanding of the concepts involved in various linear circuits and their applications. Through this lab course the students will get a good understanding of various linear ICs especially the 741 operational amplifier and its various applications. The lab also introduces to the students 555 timer and its applications, various voltage regulators and 74 series TTL ICs.

List of Experiments:

PART-1
TO VERIFY THE FOLLOWING FUNCTIONS.
2. Integrator and Differentiator using IC741 Op-Amp.
4. RC Phase Shift and Wien Bridge Oscillators using IC 741 Op-Amp.
5. IC 555 timer in Monostable operation.
7. IC 565 – PLL applications
8. Voltage regulator IC 723, three terminal voltage regulators- 7805, 7809, 7912.
9. Sample and Hold LF 398 IC.

PART-2
TO VERIFY THE FUNCTIONALITY of the following 74 series TTL ICs.
10. D Flip –Flop (74LS74) and JK Master-Slave Flip-Flop (74 LS73).
11. Decade counter (74LS90) and UP-Down Counter(74 LS192).
13. 3 -8 decoder- 74LS138.
14. 4 bit comparator 74LS85.
15. 8X1 Multiplexer — 74151 and 2X4 demultiplexer – 74155.
16. RAM (16X4) – 74189 (read and write operations).
17. Stack and queue implementation using RAM, 74189.
EQUIPMENT REQUIRED:
1. 20 MHz/ 40 MHz/60 MHz Oscilloscope.
2. 1 MHz Function Generator (Sine, Square, Triangular and TTL).
4. Multimeter / Volt Meter.

OUTCOMES: Student develops the ability to design various types of amplifiers using op-amps, waveform generation circuits, basic timer, analog and digital circuits, logic circuits using digital ICs, can be able to conduct experiments as well as to analyze and interpret results.
OBJECTIVES:
The Course is designed

- To provide students with a balanced blend of theoretical and practical aspects regarding Telecommunication Switching System.
- To expose through the evolution of switching systems from manual and electromechanical systems to stored-program-controlled digital systems.
- To provide knowledge to the students regarding design and performance analysis of various switching systems.
- To train the students about basic Telephone Networks structures and traffic engineering concepts.
- To inculcate students on various internet concepts like OSI reference model, LAN, WAN, Repeaters, bridges, routers & gateways.
- To provide a comprehensive coverage of data communication networks and ISDN.

UNIT - I

TELECOMMUNICATION SWITCHING SYSTEMS: Introduction, Elements of switching systems, switching network configuration, Rotary switches, Uniselector, Two motion selector, Trunking principle, principles of crossbar switching, Crossbar Switch Configuration, Crosspoint Technology, Crossbar Exchange Organization.

UNIT - II

ELECTRONIC SPACE DIVISION SWITCHING: Stored Program Control, Centralized SPC, Distributed SPC, Software Architecture, Application Software, Enhanced services, Two-Stage Networks, Three-Stage Networks, n-Stage Networks.

TIME DIVISION SWITCHING: Basic Time Division Space Switching, Basic Time Division Time Switching, Time Multiplexed Space Switching, Time Multiplexed Time Switching, Combination Switching, Three Stage Combination Switching, n-Stage Combinational Switching.

UNIT - III

TELECOMMUNICATIONS TRAFFIC: Introduction; The Unit of Traffic, Congestion; Traffic Measurement, A Mathematical Model, Lost-Call Systems-Theory, Traffic Performance, Loss Systems in Tandem, Use of Traffic Tables,
Queuing Systems-The Second Erlang Distribution, Probability of Delay, Finite Queue Capacity, Some Other Useful Results, Systems with a Single Server, Queues in Tandem, Delay Tables, Applications of Delay Formulae.

UNIT - IV

TELEPHONE NETWORKS: Subscriber loop systems, switching hierarchy and routing, transmission plan, transmission systems, numbering plan, charging plan, Signaling techniques: In channel signaling, common channel signaling, Cellular mobile telephony.

DATA NETWORKS: Data transmission in PSTNs, Switching techniques for data transmission, data communication architecture, link to link layers, end to end layers, satellite based data networks, LAN, MAN, Internetworking.

UNIT - V

INTEGRATED SERVICES DIGITAL NETWORK (ISDN): Introduction, motivation, new services, Network and protocol architecture, Transmission channels, User-Network interfaces, functional grouping, reference points, signaling, numbering, addressing, BISDN.

DSL TECHNOLOGY: ADSL, Cable Modem, Traditional Cable Networks, HFC Networks, Sharing, CM & CMTS and DOCSIS.


OUTCOMES:

- Students will demonstrate knowledge about Telecommunication Switching Systems.
- Students will be able to analyze different switching methodologies.
- Students will be able to differentiate between signaling methods used in Telecommunication Networks.
- Students will exhibit a good knowledge on data communication networks and ISDN and be able to differentiate LAN, MAN, WAN.
- Students will demonstrate an ability to work on various Telecommunication Network concepts.
- Students will demonstrate knowledge on modern telecommunication concepts like DSL & SONET.

TEXT BOOKS:


REFERENCES:
4. An Engineering approach to computer networking - S.Keshav, Addison Wesely
OBJECTIVES:
To familiarize with the process of management and to provide basic insights into select contemporary management practices.

UNIT- I

UNIT- II

Organisational Structures: Basic concepts related to Organisation – Departmentation and Decentralisation, Types of Mechanistic and organic structures of organisation (Line organization, Line and Staff organisation, functional organization, Committee organisation, Matrix organisation, Virtual Organisation, Cellular organisation, team structure, boundaryless organisation, Inverted Pyramid structure, Lean and Flat organisation structure) and their merits, demerits and suitability.

UNIT- III

UNIT- IV
OPERATIONS MANAGEMENT: Operations Management: Principles and types of Plant Layout - Methods of production (Job, batch and Mass Production), Work Study – Basic procedure involved in Method Study and work Measurement – Statistical Quality Control: X Chart, R chart, C chart,
P chart, (Simple Problems).

Materials Management: Objectives, Need for Inventory control, EOQ, ABC Analysis.


**UNIT - V**


**OUTCOMES**: The candidate would be in a position to suggest appropriate solution for the business decision making problem.

**TEXT BOOKS**:
1. Management Science – A R Aryasri

**REFERENCES**:
1. Management - Stoner, Freemen & Gilberth
2. Industrial Engineering & Management Science – T.R. Banga & Sharma
3. Marketing Management – Kotler Philip & Keller Kevin
6. PERT / CPM – L.S. Srinath
7. Management – VSP Rao & Gangadhar Rao
8. Production and Operations Management – SN Chary
OBJECTIVES : To understand how an antenna works, different types of antennas, their features and the modes of wave propagation

UNIT - I

UNIT - II

UNIT - III

UNIT - IV

UNIT - V


OUTCOMES:
The students will know different types of antennas, design procedures and modes of wave propagation.

TEXT BOOKS:

REFERENCES:
3. Transmission and Propagation - E.V.D. Glazier and H.R.L. Lamont,
OBJECTIVES:

- To provide the students the concepts of Intel 8086 microprocessors and their architectures
- To enable the students to write efficient programs in assembly level language of 8086 family of microprocessors.
- To train the students on the techniques of interfacing between the 8086 processor and peripheral devices, so that they can design and develop a complete microprocessor based system
- To provide the students the fundamentals of different serial communication standards
- To prepare students to learn hardware architecture of 8052 microcontroller and to do programming on it.
- To provide the students an introduction to AVR family microcontrollers.

UNIT - I

8086 ARCHITECTURE: An overview of 8085, 8086 Architecture-Functional diagram, Register Organization, Memory Segmentation, Programming Model, Memory addresses, Physical memory organization, Signal descriptions of 8086- common function signals, Minimum and Maximum mode signals, Timing diagrams.

UNIT - II

INSTRUCTION SET AND ASSEMBLY LANGUAGE PROGRAMMING OF 8086:
Instruction formats, addressing modes, instruction set, assembler directives, macros, simple programs involving logical, branch and call instructions, sorting, evaluating arithmetic expressions, string manipulations.

UNIT - III

I/O AND MEMORY INTERFACING
8255 PPI, various modes of operation and interfacing to 8086, interfacing keyboard, display, stepper motor interfacing, D/A and A/D converter, Memory interfacing to 8086.

Interrupts: Interrupt structure of 8086, Vector interrupt table, Interrupt service routine, Introduction to DOS and BIOS interrupts, Interfacing Interrupt Controller 8259, Interfacing of DMA Controller 8257.
COMMUNICATION INTERFACE: Serial communication standards, Serial data transfer schemes, 8251 USART architecture and interfacing, Basics of RS-232.

UNIT-IV: INTRODUCTION TO MICROCONTROLLERS
Overview of 8051 microcontroller, Architecture, I/O Ports, Memory organization, addressing modes and instruction set of 8051, simple programs.

8051 Real Time Control: Timer/Counter, programming 8051 timers and counters, Interrupts, programming Timer Interrupts, programming external hardware interrupts, Serial communication, programming the serial communication interrupts.

UNIT-V: THE RISC MICROCONTROLLER ARCHITECTURE
Introduction to RISC Microcontroller, SPI, I²C, TWI Serial Bus, Memory – Flash memory, EEPROM, SRAM, USART, Basics of USB.

OUTCOMES:
- Students will be able to understand the principle of operation of Intel 8086 microprocessor.
- Students will be able to write assembly language programs on Intel 8086 including ascending order and descending order of data, string operations.
- Students will be able to interface Intel 8086 processor with 8255, DMA controller, Intel 8259, USART to develop the microprocessor based system.
- Students will develop and run program of Intel 8051 microcontroller
- Students will learn architecture and interrupt structure of AVR family microcontrollers

TEXT BOOKS:
REFERENCES:

OBJECTIVES: To prepare students to understand basic principle of microwave and its applications, to train the students to analyze microwave transmission line and its characteristics, to prepare students to understand different microwave components and analyzing different type of junctions used in microwave engineering, To learn the basics of radar, complete Radar Equation, System Losses , to get exposure on C W and FMCW Radars, MTI and Pulse Doppler Radar and applications.

UNIT - I
MICROWAVE TRANSMISSION LINES: Introduction, transmission lines equations and solutions, reflection and transmission coefficients, standing waves and SWR, line impedance and line admittance. Smith chart, impedance matching using single stubs, Microwave coaxial connectors.

UNIT - II
MICROWAVE WAVEGUIDES AND COMPONENTS: Introduction, rectangular waveguides, circular waveguides, microwave cavities, microwave hybrid circuits, directional couplers, circulators and isolators.

UNIT - III
MICROWAVE DIODES,: Transfer electron devices: Introduction, GUNN effect diodes – GaAs diode, RWH theory, Modes of operation, Avalanche transit time devices: READ diode, IMPATT diode, BARITT diode, Parametric amplifiers Other diodes: PIN diodes, Schottky barrier diodes.

MIROWAVE NETWORK THEORY: Microwave network theory and passive devices. Symmetrical Z and Yparameters, for reciprocal Networks, S matrix representation of multi port networks.

UNIT - IV
MICROWAVE PASSIVE DEVICES: Microwave passive devices, Coaxial connectors and adapters, Phase shifters, Attenuators, Waveguide Tees, Magic tees.

STRIP LINES: Introduction, Microstrip lines, Parallèle strip lines, Coplanar strip lines, Shielded strip Lines.

UNIT - V
AN INTRODUCTION TO RADAR: Basic Radar, The simple form of the Radar equation, Radar block diagram, Radar frequencies, application of Radar, the origins of Radar.
MTI AND PULSE DOPPLER RADAR: Introduction to Doppler and MTI Radar, delay line Cancellers, digital MTI processing, Moving target detector, pulse Doppler Radar.

OUTCOMES: At the end of the course, students will calculate cut off frequency, identify possible modes and obtain mode characteristics, will understand the principle of operation of waveguide irises, tuning screws, posts, attenuators etc., students will derive scattering matrix for various junctions, students will know the basics of microwave solid state devices such as Gunn diode and Avalanche Devices such as IMPATT, TRAPATT diodes and efficiently use them in microwave engineering applications, The student should be able to explain the basic operation of radar system Demonstrate the C W and FMCW Radars, MTI and Pulse Doppler Radar

TEXT BOOKS:
1. Microwave Devices and circuits- Liao / Pearson Education.

REFERENCE BOOK:
1. Microwave Engineering – David M Pozar, John Wiley India Pvt.Ltd., 3rd Edn, 2
OBJECT ORIENTED PROGRAMMING
(OPEN ELECTIVE)
(Common to ECE, ETM & ICE)

III Year B.Tech II Semester

OBJECTIVES: The objective of this course is to provide object oriented concepts through which robust, secured and reusable software can be developed. To understand object oriented principles like abstraction, encapsulation, inheritance, polymorphism and also fundamentals of object-oriented programming in Java, including objects, classes, and interfaces. To provide the knowledge in packages, exception handling, multithreading. To explore AWT and applets to create GUI applications. To give the students the ability to use the potential benefits of object-oriented programming for solving complex problems efficiently.

UNIT - I
OBJECT ORIENTED THINKING: Need for OOP paradigm, A way of viewing world – Agents, responsibility, messages, methods, classes and instances, class hierarchies (Inheritance), method binding, overriding and exceptions, summary of OOP concepts, coping with complexity, abstraction mechanisms.
Java Basics History of Java, Java buzzwords, data types, variables, scope and life time of variables, arrays, operators, expressions, control statements, type conversion and costing, simple java program, concepts of classes, objects, constructors, methods, access control, this keyword, garbage collection, overloading methods and constructors, parameter passing, recursion, nested and inner classes, String handling

UNIT - II
INHERITANCE: Hierarchical abstractions, Base class object, subclass, subtype, substitutability, forms of inheritance-specialization, specification, construction, extension, limitation, combination, benefits of inheritance, costs of inheritance. Member access rules, super uses, using final with inheritance, polymorphism- method overriding, abstract classes, Object class
PACKAGES AND INTERFACES: Defining, Creating and Accessing a Package, Understanding CLASSPATH, importing packages, differences between classes and interfaces, defining an interface, implementing interface, applying interfaces, variables in interface and extending interfaces, package java.io – File, Byte Streams, Character Streams, Stream I/O.

UNIT - III
EXCEPTION HANDLING: Concepts of exception handling, benefits of
exception handling, Termination or resumptive models, exception hierarchy, usage of try, catch, throw, throws and finally, built in exceptions, creating own exception sub classes. Package java.util- Collections Framework: Collection Interface: Queue, Collection class:LinkedList,Stack class, StringTokenizer, Date, Random, Scanner.

MULTI THREADING: Differences between multi threading and multitasking, thread life cycle, creating threads, thread priorities, synchronizing threads, inter thread communication, thread groups, daemon threads.

UNIT-IV
Enumerations, auto boxing Generics –A simple generics example

EVENT HANDLING: Events, Event sources, Event classes, Event Listeners, Delegation event model, handling mouse and keyboard events, Adapter classes.

AWT: Class hierarchy, component, container, panel, window, frame, canvas, graphics. Layout Manager – layout manager types – boarder, grid, flow, card and grib bag.

UNIT - V
AWT CONTROLS: Labels, button, canvas, scrollbars, text components, check box, check box groups, choices, lists panels – scrollpane, dialogs, menubar.

APPLETS: Concepts of Applets, differences between applets and applications, life cycle of an applet, types of applets, creating applets, passing parameters to applets.

SWING: Introduction, limitations of AWT, MVC architecture, components, containers.

OUTCOMES: At the end of the course, students will be able to understand the fundamental concepts of the object oriented paradigm and their implementation in the Java programming language, write code to define classes and interfaces that uses class libraries such as java.lang, java.util, java.io, use exception handling and multithreading in programs, develop GUI applications and give object oriented solutions for the complex problems.

TEXT BOOKS:
1. Java- the complete reference, 7th edition, Herbert schildt, TMH.
2. Understanding OOP with Java, updated edition, T. Budd, Pearson Education.

REFERENCES:
1. Introduction to Java Programming, Y. Daniel Liang, Pearson Education.
OBJECTIVES: To understand what nanotechnology is about and how to use it, to gain knowledge of structure, properties, manufacturing, and applications of carbon materials, characterization methods in nanotechnology, some of the applications of nano devices and to learn the basic concepts and methods of lithography.

UNIT - I

INTRODUCTION TO NANOTECHNOLOGY: Importance of Nanoscale, Nanostructure Types, Electronic, Magnetic, Optical Properties of Nonmaterials, top-down and bottom-up approach to Nanostructures.

QUANTUM MECHANICAL PHENOMENON IN NANOSTRUCTURES: Quantum confinement of electrons in semiconductor Nanostructures, one dimensional confinement (Quantum Wires), two dimensional confinements (Quantum Wells), three dimensional confinements (Quantum Dots).

UNIT - II

CARBON NANO STRUCTURES: Carbon Nanotubes (CNTs), Fullerenes, C60, C80 and C240 Nanostructures, Properties (Mechanical, Optical and Electrical) and Applications.

UNIT - III


NANO SCALE CHARACTERIZATION TECHNIQUES: Scanning Probe Techniques (AFM, MFM, STM, SEM, TEM), XRD

UNIT - IV

NANODEVICES AND NANOMEDICINE: Lab on chip for Bioanalysis, Core/Shell Nanoparticles in Drug Delivery Systems (site specific and targeted drug delivery), Cancer Treatment and Bone Tissue Treatment.

UNIT - V

NANOLITHOGRAPHY AND NANOMANIPULATION: e-beam Lithography and SEM based Nanolithography and Nanomanipulation, Ion Beam Lithography, Oxidation and Metallization, Mask and its Application, Deep UV Lithography, X-ray based Lithography.

OUTCOMES: Students will be able to demonstrate a basic knowledge of the physical principles and techniques appropriate for solving nanotechnology problems, will be able to demonstrate an understanding of some of the most common applications of nano scale phenomena, will be able to understand and express the main principles of some commonly applied characterization techniques and methodologies and will be able to understand the basic concepts involved in lithography.

TEXT BOOKS:
2. Springer Handbook of Nanotechnology - Bharat Bhusan

REFERENCES:
1. Phani Kumar, Principles of Nanotechnology, Scitech Publications
3. Nanobiotechnology - C.M.Niemeyer, C.A. Mirkin
5. Encyclopedia of Nanotechnology- Hari Singh Nalwa
ELECTRONICS AND TELEMATICS ENGINEERING 2012-2013

ELECTROMAGNETIC INTERFERENCE AND ELECTROMAGNETIC COMPATIBILITY (OPEN ELECTIVE)
(Common to ECE & ETM)

III Year B.Tech II Semester  L  T/P/D  C
4  1/-/-  3

OBJECTIVES: To understand the standards of electromagnetic interference and compatibility, sources of electromagnetic interference, measurement of interference and to make the systems compatible.

UNIT - I

SOURCES OF EMI AND EMI COUPLING MODES: Definition of EMI and EMC, Classification, Natural and man-made EMI sources, Switching transients, Electrostatic Discharge, Nuclear Electromagnetic Pulse and High Power Electromagnetics.

Penetration- Introduction Shielding theory- shielding effectiveness, the circuit approach, the wave approach, Aperture theory, Calculation of effectiveness of a conducting box with an aperture. Introduction to propagation and cross talk- Introduction, Basic principles, determination of EM Field from Transmission Lines.

UNIT - II

EMI CONTROLLING TECHNIQUES: Grounding – Principles and Practice of Earthing, Precautions in Earthing, Measurements of ground resistance, System grounding for EMC, Cable shielding grounding.

Shielding- Theory and effectiveness, Materials, Integrity at discontinuities, Conductive coatings, cable shielding, Effectiveness measurements, Electrical Bonding.

Characteristics and types of filters- Impedance mismatch, Lumped element Low-pass, High-pass, Band-pass and Band-reject filters, Power line filter design - Common mode, Differential mode, Combined CM and DM filters, Design example.


UNIT - III

EMI MEASUREMENTS-1: Introduction to open area test site measurements – Measurement precautions – open area test site – Terrain roughness – NSA – Measurement of test site imperfections – Antenna factor measurement – Measurement errors

UNIT - IV

EMI MEASUREMENTS-2 : Conducted interference measurements – Characterization – Conducted EM noise on power supply lines – Conducted EMI from equipment – Immunity – Detectors and measurement – Pulsed EMI immunity – Electrostatic Discharge

UNIT - V


OUTCOMES : The students will know the types of interferences, sources, disadvantages, ways of controlling them, measurement techniques and compatibility.

TEXT BOOKS:


REFERENCES:

OBJECTIVES:
To develop and execute variety of assembly language programs of Intel 8086 including arithmetic and logical, sorting, searching, and string manipulation operations. To develop and execute the assembly language programs based on DOS/BIOS commands for various operations. To develop and execute the assembly language programs for interfacing Intel 8086 with peripheral devices. To develop and execute simple programs on 8051 micro controller. To train students on keil software for execution of 8051 programs. To develop and execute the assembly language programs for interfacing Intel 8051 with peripheral devices on keil software.

LIST OF EXPERIMENTS:
The Following programs/experiments are to be written for assembler and execute the same with 8086 and 8051 kits.

1. Programs for 16 bit arithmetic operations for 8086 (using Various Addressing Modes).
2. Program for sorting an array for 8086.
3. Program for searching for a number or character in a string for 8086.
4. Program for string manipulations for 8086.
5. Program for digital clock design using 8086.
6. Interfacing ADC and DAC to 8086.
7. Parallel communication between two microprocessors using 8255.
8. Serial communication between two microprocessor kits using 8251.
9. Interfacing to 8086 and programming to control stepper motor.
11. Program and verify Timer/Counter in 8051.
12. Program and verify Interrupt handling in 8051
13. UART Operation in 8051.
14. Communication between 8051 kit and PC.
15. Interfacing LCD to 8051.
16. Interfacing Matrix/Keyboard to 8051.
17. Data Transfer from Peripheral to Memory through DMA controller 8237/8257.

**Note:** Minimum of 12 experiments to be conducted

**OUTCOMES:** Students can demonstrate the use of arithmetic and logical and shift operations, sorting, and searching and string manipulation operations, the usage of DOS/BIOS commands in various assembly language programs, stepper motor interfacing, ADC and DAC conversion of voltage using Intel 8086 micro processor, the use of arithmetic and logical operations of 8051 micro controller, keil software for verification of 8051 microcontroller programs and for interfacing of 8051 microcontroller programs with peripheral devices and also for 8051 microcontroller based mini projects.
The Advanced English Communication Skills lab focuses on the career planning, professional skills and interpersonal communication skills in the globalised context.

OBJECTIVES: To improve the students’ fluency in English, through well-developed vocabulary and enable them to listen to English spoken at normal conversational speed by educated English speakers and respond appropriately in different socio-cultural and professional contexts and to enable the professional students to communicate their ideas relevantly and coherently both in writing and speaking.

SYLLABUS: The following course content is prescribed for the Advanced English Communication Skills Lab sessions:

1. Functional English – starting a conversation – responding appropriately and relevantly – using the right body language – role play in different situations.
2. Vocabulary Building – synonyms and antonyms, word roots, one-word substitutes, prefixes and suffixes, study of word origin, analogy, idioms and phrases.
3. Listening Skills – Purpose of listening – Types of listening – Barriers to listening – Sub Skills of listening – Tips for being a good listener
4. Reading Comprehension – reading for facts, guessing meanings from context, scanning, skimming, inferring meaning, critical reading.
6. Group Discussion – dynamics of group discussion, intervention, summarizing, modulation of voice, body language, relevance, fluency and coherence.
7. Presentation Skills – Oral presentation (individual and group) through JAM sessions/seminars and written presentations through posters/projects/reports/PPTs/e-mails/mind maps/assignments etc.
8. Interview Skills – concept and process, pre-interview through tele and video-conferencing.

MINIMUM REQUIREMENT:
The Advanced English Communication Skills Lab shall have integrated
**MultiMedia resources:** 20 Multimedia systems, with movable chairs and audio-visual aids with a P.A System, a Multimedia Projector, a digital stereo – audio & video system and camcorder.

**System Requirement (Hardware component)**

*Computer network with LAN with minimum 30 multimedia systems with the following specifications:*

i) CPU Requirements  
   a) Dual Core Processor  
   b) Speed – 2.8 GHZ  
   c) RAM – 1 GB Minimum  
   d) Hard Disk – 80 GB Minimum  
   e) DVD ROM Drive

ii) Headphones of High quality

**Suggested Software**

- *DELTA’s key to the Next Generation TOEFL Test: Advanced Skill Practice.*  
- *English in Mind,* Herbert Puchta and Jeff Stranks with Meredith Levy, Cambridge University Press.  

**OUTCOMES:** The candidate would be in a position to communicate both in writing and speaking critically and intelligibly with appropriate use of vocabulary and grammatical structures.

**REFERENCES:**

1. *Soft Skills: Know Yourself and Know the World,* Dr.K.Alex. S.Chand & Company Ltd.
2. *Group Discussion and Interview Skills* with VCD, Priyadarshi Patnaik, Foundation Books.
OBJECTIVES:

➢ To develop an understanding of modern network architectures from a design and performance perspective.
➢ To introduce the student to the major concepts involved in wide-area networks (WANs), local area networks (LANs) and Wireless LANs (WLANs).
➢ To clarify network terminology.
➢ To expose students to emerging technologies and their potential impact.

UNIT - I


PHYSICAL LAYER: Signals, channel data rate, Guided Transmission Media: Magnetic Media, Twisted Pair, Coaxial Cable, Fiber Optics, Wireless transmission, Digital Modulation and Multiplexing, the Mobile Telephone System.

UNIT - II

DATA LINK LAYER: Design issues, services provided to the network layer, Framing, Error Control, Flow Control, Error detection and correction, Elementary Protocols: stop and wait, Sliding Window, Go Back N, Selective Repeat, Data Link Layer in HDLC and Internet.

MEDIUM ACCESS SUB LAYER: Channel Allocation, Multiple Access Protocols ALOHA CSMA, Ethernet, Wireless LAN’s, Data Link Layer Switching.

UNIT - III

NETWORK LAYER: Design issues, Routing algorithms - the Optimality Principle, Shortest Path routing, flooding, Distance Vector Routing, Link State Routing, Hierarchical Routing, Broadcast & Multicast Routing, Routing for Mobile hosts, Routing in Ad-Hoc Networks,

QUALITY OF SERVICE: Application Requirements, Traffic Shaping, Congestion control algorithms

INTERNETWORKING: How Networks Differ, How Networks can be Connected, Tunneling, Internetwork Routing, Packet Fragmentation.
UNIT - IV

NETWORK LAYER IN THE INTERNET: IP Version 4 protocol, IP Addresses, IP Version 6, Internet Control Protocols, OSPF, BGP, Internet multicasting, Mobile IP


UNIT - V

APPLICATION LAYER: Domain Name System: DNS Name Space, Resource Records, Name Servers.


CONTENT DELIVERY: Content and Internet Traffic, Server Farms and Web Proxies, Server Replication, Content Delivery Networks, Peer-to-Peer Networks.

OUTCOMES: Upon completing the course, the student will:
- be familiar with the basics of data communication;
- be familiar with various types of computer networks;
- have experience in designing communication protocols;
- be exposed to the TCP/IP protocol suite.

TEXT BOOKS:

REFERENCES:
OBJECTIVES: To get knowledge of OS and the specifications of some OS like WINDOWS and LINUX, to get knowledge of processes/threads management polices and scheduling polices, memory management like paging, segmentation and both together, file management and protective schemes and device management polices and scheduling of devices like discs.

UNIT - I


UNIT - II

I/O MANAGEMENT: I/O devices, organization of the I/O function, OS design issues, I/O buffering


UNIT - III
MEMORY MANAGEMENT: Memory Management requirements, Memory Partitioning, Paging, Segmentation.


UNIT - IV

PRINCIPLES OF DEADLOCK: Deadlock prevention, detection and avoidance, Dining Philosophers Problem, Example Systems - UNIX, Linux, and Windows Concurrency Mechanisms.

UNIT - V
FILE MANAGEMENT: Overview, File Organization and Access, File Directories, File Sharing, Record Blocking, Secondary Storage Management,

**COMPUTER SECURITY THREATS**: Concepts, Threats, Attacks, and Assets, Intruders, Malicious Software Overview, Viruses, Warms, and Bots, Root kits

**COMPUTER SECURITY TECHNIQUES**: Authentication, Access Control, Intrusion Detection, Malware Defense, Dealing with Buffer Overflow Attacks, Example Systems

**OUTCOMES**: Student has knowledge of OS and the specifications of some OS like WINDOWS and LINUX, scheduling policies, can select required scheduling for IT products, has knowledge of memory management, can select required policy for IT products, has knowledge of file management, can select block size and files (contiguous/scattered) and has knowledge of device management, can select scheduling for discs

**TEXT BOOKS**:

**REFERENCES**:
3. Operating System a Design Approach-Crowley, TMH
ADVANCED TELECOMMUNICATION TECHNOLOGIES

IV Year B.Tech. ETM I Sem

L T/P/D C
4 -/-/ 4

COURSE /SUBJECT OBJECTIVES:

➢ To provide a solid foundation about ISDN & B-ISDN network concepts
➢ To provide knowledge to the students about ATM design goals and layering
➢ To inculcate students regarding SONET, SDH and their network configurations
➢ To provide a detailed description of ATM switching, transmission, traffic and congestion control
➢ To provide knowledge regarding network management in ATM, VOIP and WLL.

UNIT - I

BISDN ARCHITECTURE : B-ISDN standards, Broadband Services, Conversational services, Messaging services, Retrieval services, Distribution services, Business and residential services, Requirements, Architecture, Functional architecture, UNI, Transmission structure.

BISDN NETWORK CONCEPT : Networking techniques, Signaling principles, General aspects, Capabilities for BISDN signaling, Signaling virtual channels, Broadband network performance, Traffic management aspects, Operation and maintenance, customer network aspects.

UNIT - II


ATM LAYER : Cell Structure, cell header, ATM layer connections, ATM adaptation layer, AAL layers, AAL type 0, AAL type 1, AAL type 2, AAL type ¾, AAL type 5.

UNIT - III

ATM SWITCHING : Switching elements – Matrix type switching elements, Central memory switching element, Bus type switching element, Ring type switching element, Performance aspects, Technological aspects. Switching Networks – Single stage Networks, Multistage networks, Cell header processing in switch fabrics, Multicast functionality, Switches and cross connects- Generic system structure, System building blocks.
UNIT - IV

NETWORK MANAGEMENT: What is network management, the bigger picture, Traditional breakout by tasks, Survivability-where network management really pays, System depth-A network management problem, Network management from a PSTN perspective, Network management systems in enterprise networks, Telecommunication management network, Network management in ATM.

UNIT - V


LAST-MILE BROADBAND CONNECTIVITY AND WIRELESS LOCAL LOOP (WLL): Background and chapter objective, Conventional wire pair in the last mile, Wire pair in equipped with DSL modems, Digital loop carrier, Broadband microwave/millimeter wave last-mile transmission, CATV as a basic transport medium for the last mile.

COURSE OUTCOMES:
- Students will be able to understand different ISDN & B-ISDN concepts
- Students will exhibit knowledge about ATM design goals and layering
- Students will be able to analyze traffic and congestion control, ATM switching and transmission
- Students will demonstrate knowledge about interworking of ATM with existing networks
- Students will exhibit knowledge about network management in ATM, VOIP and WLL

TEXT BOOKS:

REFERENCES:
OBJECTIVES: To provide the students with the fundamental treatment about many practical and theoretical concepts that forms basic of wireless communications. To equip the students with various kinds of wireless networks and its operations. To prepare students to understand the concept of frequency reuse, and be able to apply it in the design of mobile cellular system. To prepare students to understand various modulation schemes and multiple access techniques that are used in wireless communications. To provide an analytical perspective on the design and analysis of the traditional and emerging wireless networks, and to discuss the nature of, and solution methods to, the fundamental problems in wireless networking. To train students to understand the architecture and operation of various wireless wide area networks such as GSM, IS-95, GPRS and SMS. To train students to understand wireless LAN architectures and operation. To prepare students to understand the emerging technique OFDM and its importance in the wireless communications.

UNIT - I

INTRODUCTION TO WIRELESS COMMUNICATION SYSTEMS: Evolution of mobile radio communications, Examples of wireless communication systems, Paging systems, Cordless telephone systems, Comparison of various wireless systems.


UNIT - II

CELLULAR SYSTEM DESIGN FUNDAMENTALS: Spectrum Allocation, Basic Cellular System, Frequency reuse, Channel assignment strategies, Handoff Strategies, Interference and system capacity, Trunking and grade off service, Improving coverage and capacity, cell splitting.

UNIT - III

MULTIPLE ACCESS TECHNIQUES FOR WIRELESS COMMUNICATION: Introduction to multiple access, FDMA, TDMA, Spread spectrum multiple access, Space division multiple access, Packet radio, Capacity of a cellular systems.

UNIT - IV

WIRELESS WAN : Mechanism to support a mobile environment, Communication in the infrastructure, IS-95 CDMA forward channel, IS – 95 CDMA reverse channel, Packet and frame formats in IS – 95, IMT – 2000, Forward channel in W-CDMA and CDMA 2000, Reverse channels in W-CDMA and CDMA-2000, GPRS and higher data rates, Short messaging service in GPRS mobile application protocols.

UNIT - V


OUTCOMES : Students will understand the principles of wireless communications. Students will understand fundamentals of wireless networking; Students will understand cellular system design concepts. Students will analyze various multiple access schemes used in wireless communication. Students will understand wireless wide area networks and their performance analysis. Students will demonstrate wireless local area networks and their specifications. Students will become familiar with some of the existing and emerging wireless standards. Students will understand the concept of orthogonal frequency division multiplexing.

TEXT BOOKS:


REFERENCES:

OBJECTIVES: The objective of this subject is to familiarize the student with the concepts of cellular Mobile Communication in both analog and digital cellular systems as it is very popular wireless communication technology adopted by the public in the recent past in the current

UNIT - I

INTRODUCTION TO CELLULAR MOBILE RADIO SYSTEMS: Limitations of conventional mobile telephone systems, Basic Cellular Mobile System First, Second, third and fourth generation cellular wireless systems, Uniqueness of mobile radio environment, Long term fading. Factors influencing short term fading. Parameters of mobile multipath fading, Time dispersion parameters, Coherence bandwidth. Doppler spread and coherence time, Types of small scale fading.

Concept of frequency reuse, Co-channel interference, Co-channel Interference reduction factor, Desired C/I from a normal case in a omni directional antenna system, system capacity, Trunking and grade of service, Improving coverage and capacity in cellular systems. Cell splitting, Sectoring, Microcell zone concept.

UNIT - II


Adjacent channel interference, Near end far end interference, Cross talk, Effects on coverage and interference by power decrease. Antenna height decrease, Effects of cell site components, UHF TV interference.

UNIT - III

CELL COVERAGE FOR SIGNAL AND TRAFFIC & CELL SITE AND MOBILE ANTENNAS : Signal reflections in flat and hilly terrain, Effect of human made structures. Phase difference between direct and reflected paths, Constant standard deviation. Straight line path loss slope, General formula for mobile propagation over water and flat open area, Near and long distance propagation. Path loss from a point to point prediction model in different conditions, merits of Lee model.

Sum and difference patterns and their synthesis, Coverage-omni directional
antennas, Interference reduction- directional. antennas for interference reduction, Space diversity antennas, Umbrella pattern antennas, and Minimum separation of cell site antennas, mobile antennas.

UNIT - IV

FREQUENCY MANAGEMENT AND CHANNEL ASSIGNMENT & HANDOFFS:
Numbering and grouping, Setup access and Paging channels, Channel assignments to cell sites and mobile units, Channel sharing and Borrowing, Sectorization, Overlaid cells, Non fixed channel assignment.


UNIT - V

DROPPED CALLS & DIGITAL CELLULAR SYSTEMS:
Introduction to dropped call rates and their evaluation. Global system for Mobile (GSM) – Architecture, OSI Model, Transmission, Channels and Channel Modes.

CDMA - Terms of CDMA systems, Modulation characteristics, Access channel, Call processing, Handoff Procedures

OUTCOMES:
This subject aims at providing the student with suitable concepts to understand the cellular mobile analog and digital systems and enable them to understand and apply these concepts in the state of the art projects in wireless communication in the current context.

TEXT BOOKS:

REFERENCES:
OBJECTIVES: The primary objective of this course is to introduce students to fundamentals of digital images, image transforms, image enhancement methods, restoration techniques, image encoding techniques, and various image segmentation approaches.

UNIT - I


UNIT - II


UNIT - III

IMAGE RESTORATION: Image restoration: Model of Image Degradation, Algebraic approach to restoration, inverse filtering, Minimum Mean square error (Wiener) filtering, constrained least square Filtering, Geometric Mean filter, Interactive Restoration.

UNIT - IV

UNIT - V


Wavelet based Image Processing: Introduction to wavelet transform, continuous wavelet transform, discrete wavelet transform, examples of wavelets, wavelet based image compression, wavelet based denoising and wavelet thresholding methods.

OUTCOMES: After studying this course the student understands various image processing operations. Applications of image processing techniques, which are basically various combinations of image processing techniques, can be well understood by students.

TEXT BOOKS:

REFERENCES:
ELECTRONICS AND TELEMATICS ENGINEERING 2012-2013

DSP PROCESSORS AND ARCHITECTURES
(ELECTIVE-I)
(Common to ECE, ETM)

IV Year B.Tech I Semester  L  T/P/D  C
4  -/-/-  3

OBJECTIVES: To make the students learn the analysis and design tool for DSP systems MATLAB, computational errors in DSP algorithms implementations due to quantization, and to study the architecture of DSP processors. This subject also makes the students learn in detail about TMS320C54XX series processor which enables them to implement DSP algorithms in it and to interface the same to different memory and I/O peripheral devices.

UNIT - I

INTRODUCTION TO DIGITAL SIGNAL PROCESSING: Introduction, A Digital signal-processing system, The sampling process, Discrete time sequences. Discrete Fourier Transform (DFT) and Fast Fourier Transform (FFT), Linear time-invariant systems, Digital filters, Decimation and interpolation, Analysis and Design tool for DSP Systems MATLAB, DSP using MATLAB.

COMPUTATIONAL ACCURACY IN DSP IMPLEMENTATIONS: Number formats for signals and coefficients in DSP systems, Dynamic Range and Precision, Sources of error in DSP implementations, A/D Conversion errors, DSP Computational errors, D/A Conversion Errors, Compensating filter.

UNIT - II

ARCHITECTURES FOR PROGRAMMABLE DSP DEVICES: Basic Architectural features, DSP Computational Building Blocks, Bus Architecture and Memory, Data Addressing Capabilities, Address Generation Unit, Programmability and Program Execution, Speed Issues, Features for External interfacing.

UNIT - III

EXECUTION CONTROL AND PIPELINING: Hardware looping, Interrupts, Stacks, Relative Branch support, Pipelining and Performance, Pipeline Depth, Interlocking, Branching effects, Interrupt effects, Pipeline Programming models.

PROGRAMMABLE DIGITAL SIGNAL PROCESSORS: Commercial Digital signal-processing Devices, Data Addressing modes of TMS320C54XX DSPs, Data Addressing modes of TMS320C54XX Processors, Memory space of TMS320C54XX Processors, Program Control, TMS320C54XX instructions and Programming, On-Chip Peripherals, Interrupts of TMS320C54XX processors, Pipeline Operation of TMS320C54XX Processors.
UNIT - IV

IMPLEMENTATIONS OF BASIC DSP ALGORITHMS: The Q-notation, FIR Filters, IIR Filters, Interpolation Filters, Decimation Filters, PID Controller, Adaptive Filters, 2-D Signal Processing.

IMPLEMENTATION OF FFT ALGORITHMS: An FFT Algorithm for DFT Computation, A Butterfly Computation, Overflow and scaling, Bit-Reversed index generation, An 8-Point FFT implementation on the TMS320C54XX, Computation of the signal spectrum.

UNIT - V

INTERFACING MEMORY AND I/O PERIPHERALS TO PROGRAMMABLE DSP DEVICES: Memory space organization, External bus interfacing signals, Memory interface, Parallel I/O interface, Programmed I/O, Interrupts and I/O, Direct memory access (DMA). A Multichannel buffered serial port (McBSP), McBSP Programming, a CODEC interface circuit, CODEC programming, A CODEC-DSP interface example.

OUTCOMES: At the end of the course students will be able to understand the errors that occur in different DSP algorithms due to quantization (A/D conversion). They will also be able to understand the architecture of TMS320C54XX processor, implement different algorithms on it, and interface it to different memory and peripheral devices.

TEXT BOOKS:

REFERENCES:
OBJECTIVES: To learn the importance, introductions and the basic elements, of optical fiber transmission link, fiber modes configurations and structures. To understand the different kind of losses, signal distortion in optical wave guides and other signal degradation factors. To learn the various optical source, detectors and optical fiber connectors. To learn the concept of WDM, optical fiber communication system design.

UNIT-I


UNIT-II


UNIT-III


UNIT - IV

OPTICAL DETECTORS: Physical principles of PIN and APD, Detector response time, Temperature effect on Avalanche gain, Comparision of Photodetectors.
Optical receiver operation- Fundamental receiver operation, Digital signal transmission, error sources, Receiver configuration, Digital receiver performance, Probability of error, Quantum limit, Analog receivers.

UNIT - V

OPTICAL SYSTEM DESIGN : Considerations, Component choice, Multiplexing. Point-to-point links, System considerations, Link power budget with examples. Overall fiber dispersion in Multi mode and Single mode fibers, Rise time budget with examples.

Transmission distance, Line coding in Optical links, WDM, Necessity, Principles, Types of WDM, Measurement of Attenuation and Dispersion, Eye pattern.

OUTCOMES : Student should be able to understand the importance, introductions and the basic elements, of optical fiber transmission link, fiber modes configurations and structures. Student should be able to understand the different kind of losses, signal distortion in optical wave guides and other signal degradation factors. Student will demonstrate the ability to design a system, with the knowledge of optical components as per needs and specifications.

TEXT BOOKS:

REFERENCES:
6. Introduction to fiber optics by Donald J.Sterling Jrcengage learning, 2004
DIGITAL CONTROL SYSTEMS
(ELECTIVE-II)

IV Year B.Tech. ETM I-Sem

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COURSE /SUBJECT OBJECTIVES:

- The course provides the students with the basic idea of digital control systems that cut across disciplines like electrical, mechanical.
- To prepare the students with the mathematical modeling of feedback controllers, the link between feedback concepts and sensitivity.
- To train the students with the concept of z-plane and state space analysis of discrete time systems, concept of controllability and observability.
- To inculcate students the idea of the control design techniques by using conventional methods such as lead ,lag,lead-lag compensators and digital PID controllers.
- To provide students with MATLAB tool for design and analysis of digital control systems.

UNIT – I

SAMPLING AND RECONSTRUCTION : Introduction, Examples of Data control systems –Digital to Analog conversion and Analog to Digital conversion, sample and hold operations.

UNIT – II


Z-Transform method for solving difference equations; Pulse transforms function, block diagram analysis of sampled – data systems, mapping between s-plane and z-plane.

UNIT - III

STATE SPACE ANALYSIS, CONTROLLABILITY AND OBSERVABILITY : State Space Representation of discrete time systems, Pulse Transfer Function Matrix solving discrete time state space equations, State transition matrix and it’s Properties, Methods for Computation of State Transition Matrix, Discretization of continuous time state – space equations.

Concepts of Controllability and Observability, Tests for controllability and Observability. Duality between Controllability and Observability, Controllability and Observability conditions for Pulse Transfer Function.
UNIT – IV

UNIT- V
DESIGN OF DISCRETE TIME CONTROL SYSTEM BY CONVENTIONAL METHODS AND STATE FEEDBACK CONTROLLERS AND OBSERVERS :
Design of state feedback controller through pole placement- Necessary and sufficient conditions, Ackerman’s formula. State Observers- Full order and Reduced order observers.

OUTCOMES:
- Students will be able to demonstrate knowledge of mathematics and engineering by getting exposure to various examples and problems of digital control systems.
- Students will demonstrate an ability to design a system, component and specifications by using PID tuning procedure and robust controllers.
- Students will demonstrate the understanding of impact of digital control systems in multi-disciplinary applications
- Students can participate and succeed in competitive examinations.

TEXT BOOKS:
1. Discrete time control systems, K. Ogata , Pearson Education/PHI 2nd Ed

REFERENCES:
2. Digital Control and State Variable Methods by M.Gopal TMH publication
EMBEDDED AND REAL-TIME SYSTEMS  
**(ELECTIVE-II)**

**IV Year B.Tech. ETM I-Sem**  
L  T/P/D  C  
4  -/-/-  4

**COURSE /SUBJECT OBJECTIVES:** To train students on real time embedded systems and the various blocks involved in designing the target devices. To provide students knowledge about various processors used in embedded systems such as PSoC and programming these processors for the design. And also the types of operating systems used in the embedded systems.

**UNIT – I**


**UNIT – II**

**EMBEDDED RISC PROCESSORS & EMBEDDED SYSTEM-ON CHIP PROCESSOR:** PSOC Architecture, Continuous Timer blocks, switched capacitor blocks, I/O blocks, digital blocks, programming of PSOC, Embedded RISC Processor architecture- ARM Processor architecture, Register set, Modes of operation and overview of instructions.

**UNIT - III**

**INTERRUPTS & DEVICE DRIVERS:** Exceptions and Interrupt handling Schemes- Context Switching, Deadline & interrupt latency. Device driver using Interrupt Service Routine, Serial port device driver, Device drivers for programmable timing devices.

**UNIT – IV**

**REAL-TIME SYSTEMS:** Typical real-time applications, Hard Vs Soft real-time systems. A reference model of real-time systems, Processors & Resources, Temporal Parameters of real time work load, Periodic task model precedence constraints and data dependency, functional parameters, Resource parameters of jobs and parameters of resources.

**UNIT - V**

**SCHEDULING & INTER-PROCESS COMMUNICATION:** Commonly used approaches to real-time scheduling clock driven, Weighted Round Robin, Priority Driven, Dynamic Vs state systems, Effective release time and Deadlines, Offline Vs Online Scheduling.

Inter-process Communication and synchronization of processes, Tasks and Threads-Multiple Processes in an application, Problem of Sharing data by multiple tasks & routines, Inter-process communication.
OUTCOMES: By the end of the course students learn how to design application firmware for an real time embedded system with and without using an operating systems.

TEXT BOOKS:
1. Computers as Components-principles of Embedded computer system design, Wayne Wolf, Elsevier.

REFERENCES:
1. Real Time Systems- Jane W.S. Liu-PHI.
OBJECTIVES: The goal of the course is to introduce design concepts and Architecture underlying modern complex VLSI and system-on-chip. The course is built upon student’s prior knowledge of digital circuits, digital logic and Computer Architecture. The concepts teach how complex chip-scale systems can be designed. The course is designed to give the student an understanding of different design steps required to carry out a complete digital VLSI design in silicon and to apply CMOS Technology specific layout rules in the placement and routing of transistors and interconnect, and to verify the functionality, timing, power and parasitic effects. The course main objective is to introduce the fundamental principles of VLSI Circuit design and layout and to cover the basic building blocks of large scale CMOS digital integrated circuits. It also describes the general steps required for processing of CMOS Integrated circuits and to design functional units.

UNIT- I

UNIT - II
BASIC ELECTRICAL PROPERTIES: Basic Electrical Properties of MOS and BiCMOS Circuits: \( I_{ds} - V_{ds} \) relationships, MOS transistor threshold Voltage \( V_t \), \( g_m \), \( g_{ds} \), Figure of merit \( \omega \); Pass transistor, NMOS Inverter, Various pull ups, CMOS Inverter - analysis and design, BiCMOS Inverters.


UNIT- III

DATA PATH SUBSYSTEMS: Subsystem Design, Shifters, Adders, ALUs, Multipliers, Parity generators, Comparators, Zero/One Detectors, Counters.
UNIT - IV

ARRAY SUBSYSTEMS : SRAM, DRAM, ROM, Serial Access Memories, Content Addressable Memory.

SEMICONDUCTOR INTEGRATED CIRCUIT DESIGN : PLAs, Programmable Array Logic, FPGAs, CPLDs, Standard Cells, Design Approach, Introduction to low power design.

UNIT-V


OUTCOMES : Students will be able to understand the operation of a MOS transistor, down to physical level and relate the knowledge to the development of its operational equations, and will be able to analyze and implement various logic gates and circuits, using MOS Transistors. The student will be able to design circuit components and verify their performance using simulation tools. The student can design static CMOS Combinational and Sequential logic at the transistor level, including mask layout, and will be able to implement designs with FPGA devices and CPLD'S.

TEXT BOOKS:

REFERENCES:
5. Introduction to VLSI – Mead & Convey, BS Publications, 2010
OBJECTIVES:
- To understand the principles of spread spectrum systems, including the Global Positioning System.
- To understand the principles of finite fields, orthogonal codes, and pseudorandom noise sequences.
- To use generator functions to generate pseudorandom codes.
- To develop a fundamental understanding of spread spectrum communication systems.
- To develop an understanding of the ability of spread spectrum to combat jamming, combat fading and prevent intercept.

UNIT-I

UNIT-II
MULTI-USER DETECTION IN CDMA CELLULAR RADIO: Single User Receiver in a Multi User Channel, Optimal Multi-User Detection, Linear Suboptimal Detectors, Interference Combat Detection Schemes, Interference Cancellation Techniques

UNIT-III
BINARY SHIFT REGISTER SEQUENCES FOR SPREAD SPECTRUM SYSTEMS: Introduction, Definitions, Mathematical Background and Sequence Generator Fundamentals, Maximal Length Sequences, Gold Codes
CODE TRACKING LOOPS: Introduction, Optimum Tracking of Wide Band Signals, Base Band Delay-Lock Tracking Loop, Tau-Dither Non-Coherent Tracking Loop, Double Dither Non-Coherent Tracking Loop

UNIT-IV
INITIAL SYNCHRONIZATION OF THE RECEIVER SPREADING CODE: Introduction, Problem Definition and the Optimum Synchronizer, Serial Search
Synchronization Techniques, Synchronization Using a Matched Filter, Synchronization by Estimated the Received Spreading Code

UNIT-V

PERFORMANCE OF SPREAD SPECTRUM SYSTEMS IN JAMMING ENVIRONMENTS: Spread Spectrum Communication System Model, Performance of Spread Spectrum Systems without Coding

PERFORMANCE OF SPREAD SPECTRUM SYSTEMS WITH FORWARD ERROR CORRECTION: Elementary Block Coding Concepts, Optimum Decoding Rule, Calculation Of Error Probability, Elementary Convolution Coding Concepts, Viterbi Algorithm, Decoding And Bit-Error Rate

OUTCOMES: Upon completing this course student should be able to:

- Understand the architecture and elements of a spread-spectrum system and a CDMA system
- Understand the characteristics of spread-spectrum signal waveforms
- Apply their knowledge of communications technology to CDMA and wireless systems
- Understand the methods for spread-spectrum and CDMA system performance analysis
- Capture most recent development in CDMA and its role in 3G wireless system

TEXTBOOKS:

REFERENCES:
COMPUTER NETWORKS LAB

IV Year B.Tech. I-Semester

COURSE OBJECTIVES:

- To study the routing protocols - RIP, OSPF, BGP
- To study Wireless LAN & Mobile Wireless Networks
- To study Ethernet, Token Ring
- To study Switched LANs, Network Design
- To study Queuing Disciplines

1. **Ethernet**: A Direct Link Network with Media Access Control
2. **Token Ring**: A shared-Media Network with Media Access Control
3. **Switched LANs**: A set of Local Area Networks Interconnected by Switches
4. **Network Design**: Planning a Network with different users, Hosts and Services
5. **ATM**: A connection oriented cell switching technology
6. **Routing Information Protocol (RIP)**: A Routing Protocol based on the distance vector Algorithm
7. **OSPF**: Open Shortest Path First: A Routing Protocol based on the Link State Algorithm
8. **Broader Gateway Protocol (BGP)**: An Inter-domain Routing Protocol
9. **Transmission Control Protocol (TCP)**: A Reliable connection oriented byte stream service Queuing disciplines
10. **Queuing Disciplines**: Order of Packet Transmission and Dropping
11. **RSVP**: Resource Reservation Protocol: Providing QoS by reserving resources in the network
12. **Firewalls and VPN**: Network Security and Virtual Private networks
13. **Applications**: Network Applications, Performance and Analysis
14. **Wireless Local Area Networks**: Medium Access control for wireless connected stations
15. **Mobile Wireless Networks**: A wireless Local Area Network with mobile stations

Note:

(i) The Experiments can be performed using software’s like NETSIM, OPNET, NS2
QUALNET or Equivalent Softwares.

(ii) Minimum of 12 Experiments are to be performed.

COURSE OUTCOMES:

- Students will be able to study the working principles of routing protocols.
- Students will be able to analyze loss, utilization & Transmission time with varying distance between access points & wireless nodes. Will be able to analyze the effect of different mobility models in mobile wireless networks.
- Students will be able to create simple network model and study the loss incurred in a network running traditional Ethernet with varying number of transmitting nodes. Students will be able to investigate the performance of a token ring network and obtain an appreciation of how network performance is affected by various parameter values.
- Students will be able to compare performance of different switching networks like store and forward, cut through and fragment free. Will be able to design and simulate a LAN network, and then a wireless LAN network, with different number of nodes and analyze their respective performance.
- Students will be able to create the queue from a source to generate packets, a queue to act as the buffer and server, a sink to dispose of serviced packets and study how the delay of such a queuing system varies.
ADVANCED TELECOMMUNICATIONS LAB

IV Year B.Tech. I-Semester L T/P/D C
- -/3/- 2

COURSE OBJECTIVES:

- To study the bending and transmission losses, numerical aperture of optical fibre
- To study the digital switching system and EPABX
- To study different ISDN layers
- To study LAN Routing protocols using N-SIM
- To study LAN Topologies and CSMA protocols using L-SIM

Minimum of 12 experiments to be performed

1. Console Programming in Digital Automatic Telephone Exchange
2. Routing in Digital Automatic Telephone Exchange
3. Study of Digital Switching mechanism in EPABX
4. Analysis, Simulation and Study of ISDN layers
5. Routing Algorithms in Network Simulators
6. Simulation of different protocols using LAN Simulator
7. T-S-S-T Switching and Generation of Time Switching Signal using Multiplexer, Spaced Switched Signal, Observe Cross talk
8. Crossbar Switching
9. Measurement of Losses in Optical Fiber
10. Characteristics of Fiber Optic LED
11. Simulation of LAN Topologies
12. Simulation of Congestion Control Algorithms in LAN Environment
13. Simulation of TCP/IP Model Protocol
14. Simulation of Signaling in ISDN
15. Simulation of Circuit Switching
16. Study of Features of Voice over Internet Protocol
17. PC-PC Communication using Fiber Optics

COURSE OUTCOMES:

- Students will be able to calculate the numerical aperture and losses of optical fiber
- Students will be able to analyze the different switching techniques like routing and console programming. They will be able to analyze enhanced features of an automatic branch exchange
- Students will be able to analyze and simulate different ISDN layers
WIRELESS AND MOBILE ADHOC NETWORKS  
(ELECTIVE-III)

IV Year B.Tech.  II-Semester  L  T/P/D  C
4  -/-/-  4

COURSE OBJECTIVES:
➢ To give an understanding of the basic knowledge on wireless lans, adhoc wireless networks, and protocols.
➢ To give an overview of networking principles and how the wireless protocols, routing, operate.
➢ To know the basic background in wireless networks that will allow them to practice in this field and that will form the foundation for more advanced courses in networking.
➢ To acquire the basic skills needed to write network applications in software tools i.e Netsim.
➢ To give an overview of the issues and challenges in adhoc networks.

UNIT - I
WIRELESS INTERNET: Wireless Internet, Mobile IP, TCP in wireless Domain WAP, Optimizing Web over Wireless.

UNIT – II

UNIT - III
management, secure routing in Ad-Hoc wireless networks.

UNIT - IV


UNIT - V

ENERGY MANAGEMENT: Introduction, need for energy management in adhoc wireless networks, classification of energy management schemes, battery management schemes, transmission power management schemes, system power management schemes. Security in Ad-Hoc Networks

COURSE OUTCOMES:

- Student will have the ability to implement a routing algorithm.
- Student will have the ability to understand the layers and services.
- Student will have the ability to understand the issues involved in wireless network security.

TEXT BOOKS:


REFERENCE BOOKS:

OBJECTIVES: Main aim of this subject is to analyse & design of the satellite communication system. It discusses various topics of basic communications such as electromagnetic fields, radiopropagation, antennas, orbital mechanics, GPS, multiple access systems etc. This will help students for pursuing post graduate studies and also for those who prepare for various competitive examinations.

UNIT-I

INTRODUCTION: Origin of Satellite Communications, historical background, basic concepts of satellite communications, frequency allocations for satellite services, applications, future trends of satellite communications.


UNIT-II

SATELLITE SUBSYSTEMS: Attitude and orbit control system, telemetry, tracking, command and monitoring, power systems, communication subsystems, satellite antenna equipment reliability and space qualification.

SATELLITE LINK DESIGN: Basic transmission theory, system noise temperature and G/T ratio, Design of down links, up link design, Design of satellite links for specified C/N, System design example.

UNIT-III

MULTIPLE ACCESS: Frequency division multiple access (FDMA), intermediation, calculation of C/N. Time division Multiple Access (TDMA) frame structure, examples. Satellite Switched TDMA Onboard processing, DAMA, Code Division Multiple Access (CDMA), Spread spectrum transmission and reception.

UNIT-IV

EARTH STATION TECHNOLOGY: Introduction, transmitters, receivers, antennas, tracking systems, terrestrial interface, primary power test methods.

LOW EARTH ORBIT AND GEO-STATIONARY SATELLITE SYSTEMS: Orbit consideration, coverage and frequency considerations, delay & throughput considerations, system considerations, operational NGSO constellation designs.
UNIT-V

SATELLITE NAVIGATION & THE GLOBAL POSITIONING SYSTEM: Radio and Satellite Navigation, GPS Position Location principles, GPS Receivers and codes, Satellite signal acquisition, GPS Navigation Message, GPS signal levels, GPS receiver operation, GPS C/A code accuracy, Differential GPS.

OUTCOMES: From this unit students can learn basics in satellite communications, and also can learn about telemetry, tracking of satellite sub systems and system designing. Since this subject have inter link with wireless communications students can easily understand, analyze the concepts and also helpful in pursuing higher studies.

TEXT BOOKS:

REFERENCES:
MOBILE COMPUTING
(ELECTIVE-III)

IV Year B.Tech. II-Semester  L  T/P/D  C
4  -/-/-  4

COURSE /SUBJECT OBJECTIVES:

- To learn about the concepts and principles of mobile computing.
- To provide guidelines, design principles and experience in developing applications for small, mobile devices, including an appreciation of context and location aware services.
- To prepare students to understand MAC protocols that is used for small handheld devices.
- To train students to understand the layered architecture of mobile devices.
- To introduce Mobile adhoc networking principles and its various routing algorithms.
- To develop skills of finding solutions and building software for mobile computing applications.

UNIT-I

INTRODUCTION: Mobile Communications, Mobile Computing – Paradigm, Promises/Novel Applications and Impediments and Architecture; Mobile and Handheld Devices, Limitations of Mobile and Handheld Devices.

GSM - Services, System architecture, Radio interfaces, Protocols, Localization, calling, Handover, Security, New data services, GPRS, CSHSD, DECT.

UNIT-II

(WIRELESS) MEDIUM ACCESS CONTROL: Motivation for a specialized MAC (Hidden and exposed terminals, Near and far terminals), SDMA, FDMA, TDMA, CDMA. MAC protocols for GSM, Wireless LAN (IEEE 802.11), Collision Avoidance (MACA, MACAW) Protocols.

MOBILE IP NETWORK LAYER: IP and Mobile IP Network Layers, Packet Delivery and Handover Management, Location Management, Registration, Tunneling and Encapsulation, Route Optimization, DHCP.

UNIT–III


DATABASE ISSUES: Database Hoarding & Caching Techniques, Client-Server Computing & Adaptation, Transactional models, Query processing, Data Recovery Process & and quality of service issues.
UNIT–IV


UNIT–V

MOBILE AD HOC NETWORKS (MANETS): Introduction, Applications & Challenges of a MANET, Routing, Classification of Routing Algorithms, Algorithms such as DSR, AODV, DSDV etc., Mobile Agents, Servicediscovery.


COURSE OUTCOMES:

- Students will understand the concept of mobile computing technologies and applications.
- Students will understand how the underlying wireless and mobile communication networks work, their technical features, and what kinds of applications they can support.
- Students are trained to understand the MAC protocols and multiple access mechanisms.
- Students will demonstrate the functionalities and components of mobile computing systems into different layers and apply various techniques for realizing the functionalities.
- Students will understand the working of heterogeneous networks.
- Students will develop mobile computing applications by analyzing their characteristics and requirements, selecting the appropriate computing models and software architectures, and applying standard programming languages and tools.

TEXT BOOKS:


REFERENCE:

OBJECTIVES: An artificial neural network, often just named a neural network, is a mathematical model inspired by biological neural networks. A neural network consists of an interconnected group of artificial neurons, and it processes information using a connectionist approach to computation. In most cases a neural network is an adaptive system changing its structure during a learning phase. Neural networks are used for modeling complex relationships between inputs and outputs or to find patterns in data.

UNIT-I
INTRODUCTION TO ARTIFICIAL NEURAL NETWORKS: Introduction, Artificial Neural Networks, Historical Development of Neural Networks, Biological Neural Networks, Comparison Between Brain and the Computer, Comparison Between Artificial and Biological Neural Networks, Network Architecture, Setting the Weights, Activation Functions, Learning Methods.

UNIT-II

UNIT-III

UNIT-IV
ADALINE AND MADALINE NETWORKS: Introduction, Adaline Architecture,
Algorithm, Applications, Madaline, Architecture, MRI Algorithm, MR II Algorithm.


**UNIT-V**

**ASSOCIATIVE MEMORY NETWORKS – I**: Types, Architecture, Continuous and Discrete Hopfield Networks, Energy Analysis, Storage and Retrieval Algorithms, Problems with Hopfield Networks.


**OUTCOMES**: By the end of the course students learn the utility of artificial neural network models lies in the fact that they can be used to infer a function from observations. This is particularly useful in applications where the complexity of the data or task makes the design of such a function by hand impractical.

**TEXTBOOKS**:
2. Artificial Neural Networks - B. Yegnanarayana, PHI.

**REFERENCES**:
1. Introduction to Neural Networks Using MATLAB 6.0 - S.N. Shivanandam, S. Sumati, S. N. Deepa, TMH.
4. Fundamental of Neural Networks – Laurene Fausett, Pearson, 1st Ed.
OBJECTIVES: To acquire an understanding of network security and its changing character, to understand how network security is conceptualized and carried out, to examine the historical evolution of network security, to analyze both early and contemporary threats to network security, to articulate informed opinion about issues related to network security, to identify and investigate threats to network security, to appreciate the challenges of network security.

UNIT-I


UNIT-II

CONVENTIONAL CRYPTOGRAPHY PRINCIPLES: Conventional Encryption Algorithms, Cipher Block Modes of Operation, Location of Encryption Devices, Key Distribution Approaches of Message Authentication, Secure Hash Functions and HMAC


UNIT-III

EMAIL PRIVACY: Pretty Good Privacy (PGP) and S/MIME

UNIT-IV


WEB SECURITY REQUIREMENTS: Secure Socket Layer (SSL) and Transport Layer Security (TLS), Secure Electronic Transaction (SET).

UNIT-V

Basic Concepts of SNMP, SNMP V1 Community Facility and SNMPv3, Intruders, Viruses and Related Threats
FIREWALL DESIGN PRINCIPLES: Trusted Systems, Intrusion Detection Systems

OUTCOMES: After completing this course student should know the protocols related to security services, be familiar with the fundamentals of cryptography. Be familiar with network security threats and counter measures. Be familiar with network security designs using available secure solutions, be familiar with advanced security issues and technologies, be exposed to original research in network security.

TEXT BOOKS:

REFERENCES:
1. Fundamentals of Network Security by Eric Maiwald {Dream Tech Press}
6. Introduction to Cryptography, Buchmann, Springer
INTERNETWORKING
(ELECTIVE-IV)
(ECE, ETM)

IV Year B.Tech II Semester

OBJECTIVES: To understand the major protocols for internetworking in today’s Internet and to gain the ability to learn new Internet technologies by yourself.

UNIT - I


UNIT - II

TCP: TCP Services, TCP features, segment, A TCP connection, UDP-Introduction, User datagram, UDP Services: process-to-process communication, connectionless services, flow control, error control, congestion control, encapsulation and decapsulation.

UNIT - III

TCP FLOW CONTROL: Opening and closing windows, shrinking windows, silly window syndrome, TCP error control-checksum, acknowledgement, retransmission, out-of-order segments. TCP Congestion control- congestion window, congestion policy.

UNIT - IV

STREAM CONTROL TRANSMISSION PROTOCOL: Introduction, SCTP services: process-to-process communication, multiple streams, multi homing, full-duplex communication, connection-oriented service. SCTP features: transmission sequence number, stream identifier, packets, acknowledgement number, flow control, error control. Packet format.

UNIT - V


OUTCOMES: Internetworking concepts with IP Address of Classful Addressing and Classless Addressing, Internet Protocol (IP) and Transmission Control Protocol (TCP), Unicast Routing Protocols (RIP, OSPF and BGP), Domain Name System (DNS), Remote Login TELNET, Network Management and Multimedia: Digitizing Audio and Video

TEXTBOOKS:

REFERENCES:
OBJECTIVES: This course introduces the basic concepts of Multimedia, fundamentals of Color in Image and Video, Compression Algorithms of Image and Video Compression Techniques along with Audio Compression required to support multimedia requirements. Emphasis on the topics of Computer and Multimedia Networks Multimedia Network Communications and Applications is laid.

UNIT-I


COLOR IN IMAGE AND VIDEO: Color Science - Image Formation, Camera Systems, Gamma Correction, Color Matching Functions, CIE Chromaticity Diagram, Color Monitor Specifications, Out-of-Gamut colors. White point correction, XYZ to RGB transform. Transform with Gamma Correction, L*a*b* Color model.

COLOR MODELS IN IMAGES - RGB color model for CRT displays, Subtractive.

UNIT-II

COLOR MODELS IN VIDEO: Video Color Transforms. YUV color model, YIQ color model, YCbCr Color Model


AUDIO CONCEPTS: Digitization of sound, Quantization and Transmission of audio.

UNIT-III


LOSSY IMAGE COMPRESSION ALGORITHMS: TRANSFORM CODING: KLT and DCT Coding, Wavelet based coding.

IMAGE COMPRESSION STANDARDS: JPEG and JPEG2000.
UNIT-IV

VIDEO COMPRESSION TECHNIQUES : Introduction to Video Compression. Video Compression based on Motion Compensation. Search for motion vectors. H.261- Intra-frame and Inter-frame coding, Quantization, Encoder and Decoder, Overview of MPEG1 and MPEG2.

AUDIO COMPRESSION TECHNIQUES : ADPCM in Speech Coding, G.726 ADPCM, Vocoder - Phase Insensitivity, Channel Vocoder, Formant Vocoder, Linear Predictive Coding, CELP, Hybrid Excitation Vocoder, MPEG Audio - MPEG Layers, MPEG Audio Strategy, MPEG Audio Compression algorithms, MPEG-2 AAC, MPEG-4 Audio.

UNIT-V


MULTIMEDIA NETWORK COMMUNICATIONS AND APPLICATIONS : Quality of Multimedia data transmission, multimedia over IP, Multimedia over ATM networks, Transport of MPEG4, Media on Demand.

OUTCOMES : The completion of course enables to understand the basics of Multimedia, Color models of Image and Video, Compression of Image, Video and Audio, demonstrate the knowledge of Computer and Multimedia Networks Multimedia Network Communications and Applications.

TEXT BOOKS:

REFERENCE BOOKS:
5. Video Processing and Communications - Yaowang, Jorn Ostermann, Ya-Qin Zhang, Pearson, 2002
WIRELESS SENSOR NETWORKS
(ELECTIVE-IV)

IV Year B.Tech. II-Semester

COURSE /SUBJECT OBJECTIVES:

➢ To give an understanding of the basic knowledge on wireless adhoc networks, wireless sensor networks and protocols.
➢ To give an overview of principles and how the wireless sensor protocols, routing, operate.
➢ To know the basic background in wireless sensor networks that will allow them to practice in this field and that will form the foundation for advanced courses in wireless networking.
➢ To acquire the basic skills needed to write network applications in software tools such as Mat lab.
➢ To give an overview of the issues and challenges in sensor networks.

UNIT- I


UNIT- II


UNIT- III


MODELING SENSOR NETWORKS : Introduction, Modeling the sensor nodes connectivity, Unit disk graph, General graph, Quasi unit disk Graph, QUDG variations, Bounded independence graph, Interference issues in wireless
sensor networks.

UNIT- IV

ROUTING PROTOCOLS: Introduction, Design issues, Aribute based protocols, Directed diffusion, Energy – Aware Data –Centric routing, Constrained path energy aware routing, Flat protocols, Gradient broadcast, Sequential assignment routing, Geographical routing, Speed, Geographic routing with no location information, Energy—efficient forwarding strategies for geographic routing in lossy wireless sensor networks, Geographic routing with limited information in sensor networks, Hierarchical protocols, Multipath routing, QoS based protocols.

UNIT-V

CLUSTERING IN WIRELESS SENSOR NETWORKS: Introduction wireless sensors networks and graph theory concepts, Graph based approach for clustering in wireless sensor network (excluding coding) Zone based clustering, Peer- peer generalized clustering model, Cluster based graph network.


OUTCOMES:
- Student will have the ability to implement a routing algorithm.
- Student will have the ability to understand the layers and services.
- Student will have the ability to understand the issues involved in wireless network security.

TEXT BOOKS:

REFERENCE BOOKS:
COURSE OBJECTIVES:

- The objective of the course is to study about Benefits of cloud model – limitations of cloud – legal issues in the cloud – key characteristics of cloud computing – Challenges for the cloud – The evolution of cloud computing.
- Study Amazon EC2 ,Google App Engine cloud systems;

UNIT - I


Overview of Cloud Computing: Meaning of the terms cloud and cloud computing – cloud based service offerings.

UNIT - II


UNIT - III


UNIT - IV

End user access to cloud Computing: youtube – zimbra – Facebook – Zoho – DimDim Collaboration. Mobile internet devices and the cloud:
Smartphone – mobile operating systems for smart phones – Mobile Platform virtualization – Collaboration applications for mobile platforms – future trends.

UNIT - V
Virtualization: Adding guest Operating system. Cloud computing case studies 1: Amazon EC2 – Amazon simple DB – Amazon S3 – Amazon Cloud Front – Amazon SQS.


COURSE OUTCOMES:
- Upon completion of the course, students shall be able to:
- Identify and describe cloud computing techniques and their roles in building intelligent cloud
- Effectively Identify the Identity and Privacy in the Cloud
- How End user access to cloud Computing

TEXT BOOKS:

REFERENCE BOOKS:
1. Cloud Application Architectures by George Reese, Oreilly publishers.
# OPTICAL NETWORKS
(ELECTIVE - V)

## IV Year B.Tech II Semester

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## COURSE OBJECTIVES

- Develop an in-depth understanding, in terms of architecture, protocols and applications, of major optical networking technologies
- To learn and solve problems pertaining to the optical networking technologies
- Identify suitable technologies to meet a given set of requirements
- Develop necessary background to be able to perform projects involving optical network technologies

## UNIT-I

### CLIENT LAYERS OF OPTICAL NETWORKS:

## UNIT-II

### WDM NETWORK ELEMENTS AND DESIGN:

## UNIT- III

### NETWORK CONTROL AND MANAGEMENT:

## UNIT- IV

### NETWORK SURVIVABILITY:
Basic Concepts of Survivability, Protection in SONET / SDH Links and Rings, protection in IP Networks, Optical Layer Protection- Service Classes, Protection Schemes, Interworking between Layers.

## UNIT – V

### ACCESS NETWORKS AND PHOTONIC PACKET SWITCHING:
Networking Architecture, Enhanced HFC, FTC, Photonic Packet Switching- OTDm, Synchronization, Header Processing, Buffering, Burst Switching, Test Beds.
COURSE OUTCOMES:

- Students will understand architecture, protocols and applications, of major optical networking technologies
- Students will gain knowledge on various optical networks to perform projects involving optical network technologies

TEXT BOOKS:


REFERENCE:

OBJECTIVES: To provide an in-depth knowledge of the design of digital circuits and the use of Hardware Description Language in digital system design and to introduce the students, digital designs, which focuses on different methodologies and styles in Hardware modeling with emphasis on the use of verilog HDL. The student should be able to Design combinational circuits using logic gates and other common building blocks and to Design sequential circuits, including registers and counters using Verilog HDL.

UNIT-I

INTRODUCTION TO VERILOG HDL: Verilog as HDL, Levels of Design Description, Concurrency, Simulation and Synthesis, Functional Verification, System Tasks, Programming Language Interface (PLI), Module, Simulation and Synthesis Tools, Test Benches.

LANGUAGE CONSTRUCTS AND CONVENTIONS: Introduction, Keywords, Identifiers, White Space Characters, Comments, Numbers, Strings, Logic Values, Strengths, Data Types, Scalars and Vectors, Parameters, Operators.

UNIT-II

MODELING AT DATA FLOW LEVEL: Introduction, Continuous Assignment Structures, Delays and Continuous Assignments, Assignment to Vectors, Operators, Test benches and Exercises.

GATE LEVEL MODELING: Introduction, AND Gate Primitive, Module Structure, Other Gate Primitives, Illustrative Examples, Tri-State Gates, Array of Instances of Primitives, Additional Examples, Design of Flip-flops with Gate Primitives, Delays, Strengths and Contention Resolution, Net Types, Design of Basic Circuits, Test Benches and Exercises.

UNIT-III

UNIT-IV

SWITCH LEVEL MODELING : Introduction, Basic Transistor Switches, CMOS Switches, Bi-directional Gates, Time Delays with Switch Primitives, Instantiations with Strengths and Delays, Strength Contention with Trireg Nets, Test Benches and Exercises.

SYSTEM TASKS, FUNCTIONS, AND COMPILER DIRECTIVES: Introduction, Parameters, Path Delays, Module Parameters, System Tasks and Functions, File-Based Tasks and Functions, Compiler Directives, Hierarchical Access, User- Defined Primitives, Design Verification, Assertion Verification.

UNIT-V

DIGITAL DESIGN WITH SM CHARTS : State Machine Charts, Derivation of SM Charts, Realization of SM Charts, Implementation of the Dice game, Alternative realizations for SM Charts using Microprogramming, Linked State Machines.

VERILOG MODELS: Static RAM Memory, A simplified 486 Bus Model, Interfacing Memory to a Microprocessor Bus, UART Design, Design of Microcontroller CPU.

OUTCOMES : Students will be able to design different digital circuits and are able to write the programs in Verilog code. Students will have the knowledge of HDL, structural, data flow and behavioral models architectures. Students will be able to design the combinational & sequential logic circuits using Verilog HDL.

TEXT BOOKS:

REFERENCES:
OBJECTIVES:
To deal with RF filters, Networks and designing

UNIT-I

UNIT-II

UNIT-III

UNIT-IV
MATCHING AND BIASING NETWORKS: Impedance matching using discrete components: two component matching networks, forbidden regions, frequency response and quality factor, T and Pi Matching Networks-Amplifier classes of operation and Biasing Networks: classes of operation
and efficiency of amplifiers, Biasing Networks for BJT, Biasing Networks for FET.

UNIT-V

RF TRANSISTOR AMPLIFIER DESIGN: Characteristics of amplifiers-amplifier power relations: RF source, transducer power gain, additional power relations-Stability considerations: stability circles, unconditional stability, and stabilization methods-unilateral and bilateral design for constant gain-noise figure circles-constant VSWR circles. RF oscillators and mixers: Basic oscillator model: Negative resistance oscillator, feedback oscillator design, design steps, Quartz oscillators-Fixed Frequency high Frequency oscillator-Basic Characteristics of Mixers: Concepts, Frequency Domain considerations, single ended mixer Design, single and double balanced mixers.

OUTCOMES: RF Design, RF Behavior, Transmission Lines, matching and biasing networks, RF transistor amplifier design

TEXT BOOKS:
3. Radio Frequency and Microwave Electronics-illustrated by Matthew M.Radmanesh-PEI

REFERENCES:
1. RF Circuit Design-Christopher Bowick, Cheryl Aljunii and john Biyler, Elsevier science, 2008.