JAWAHARLAL NEHRU
TECHNOLOGICAL UNIVERSITY ANANTAPUR
ANANTAPUR – 515 002 (A.P) INDIA

ACADEMIC REGULATIONS
COURSE STRUCTURE
AND
DETAILED SYLLABI

ELECTRONICS AND
CONTROL ENGINEERING

B.Tech. Regular Four Year Degree Course
(Applicable for the batches admitted from 2009-2010)
&
B.Tech. (LES) (for the batches admitted from 2010-11)
Academic Regulations 2009 for B. Tech (Regular)
(Effective for the students admitted into I year from the Academic Year 2009-2010 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. Pursue a course of study for not less than four academic years and in not more than eight academic years.
   
   ii. Register for 220 credits and secure all 220 credits

2. Students, who fail to fulfil 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 and their admission is cancelled.

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

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Branch</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Aeronautical Engineering</td>
</tr>
<tr>
<td>2.</td>
<td>Biotechnology</td>
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<tr>
<td>3.</td>
<td>Civil Engineering</td>
</tr>
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<td>4.</td>
<td>Computer Science and Engineering</td>
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<tr>
<td>5.</td>
<td>Computer Science and System Engineering</td>
</tr>
<tr>
<td>6.</td>
<td>Electrical and Electronics Engineering</td>
</tr>
<tr>
<td>7.</td>
<td>Electronics and Communication Engineering</td>
</tr>
<tr>
<td>8.</td>
<td>Electronics and Computer Engineering</td>
</tr>
<tr>
<td>9.</td>
<td>Electronics and Control Engineering</td>
</tr>
<tr>
<td>10.</td>
<td>Electronics and Instrumentation Engineering</td>
</tr>
<tr>
<td>11.</td>
<td>Information Technology</td>
</tr>
<tr>
<td>12.</td>
<td>Mechanical Engineering</td>
</tr>
</tbody>
</table>

and any other course as approved by the authorities of the University from time to time.
4. Credits

<table>
<thead>
<tr>
<th></th>
<th>I Year</th>
<th></th>
<th>Semester</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Periods / Week</td>
<td>Credits</td>
<td>Periods / Week</td>
<td>Credits</td>
</tr>
<tr>
<td>Theory</td>
<td>03</td>
<td>06</td>
<td>03</td>
<td>04</td>
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<td></td>
<td>02</td>
<td>04</td>
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<tr>
<td>Practical</td>
<td>03</td>
<td>04</td>
<td>03</td>
<td>02</td>
</tr>
<tr>
<td>Drawing</td>
<td>06</td>
<td>06</td>
<td>03</td>
<td>02</td>
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<tr>
<td></td>
<td>06</td>
<td>02</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Seminar</td>
<td>--</td>
<td>--</td>
<td>6</td>
<td>02</td>
</tr>
<tr>
<td>Project</td>
<td>--</td>
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<td>15</td>
<td>10</td>
</tr>
</tbody>
</table>

5. Distribution and Weightage of Marks

i. The performance of a student in each semester / I year shall be evaluated subject-wise with a maximum of 100 marks for theory and 75 marks for practical subject. In addition seminar and project work shall be evaluated for 50 and 200 marks respectively.

ii. For theory subjects the distribution shall be 30 marks for Internal Evaluation and 70 marks for the End-Examination.

iii. For theory subjects, during the semester there shall be Two midterm examinations. Each mid term examination consists of objective paper for 10 marks and subjective paper for 20 marks with duration of 1 hour 50 minutes (20 minutes for objective and 90 minutes for subjective paper).

   Objective paper is set for 20 bits for 10 marks. Subjective paper shall contain 5 questions of which student has to answer 3 questions evaluated* for 20 marks. First mid term examination shall be conducted for I-IV units of syllabus and second mid term examination shall be conducted for V -VIII units. The total marks secured by the student in each mid term examination for 30 marks is considered and the better of the two mid term examinations shall be taken as the final sessional marks secured by each candidate in the subject.

   However for first year, there shall be Three midterm examinations as in the above pattern and the average marks of the
best two midterm examinations secured in each subject shall be considered as final marks for sessionals.

*Note 1: The subjective paper shall contain 5 questions of equal weightage of 10 marks and the marks obtained for 3 questions shall be condensed to 20 marks, any fraction rounded off to the next higher mark

*Note 2: The mid term examination shall be conducted first by distribution of the Objective paper simultaneously marking the attendance, after 20 minutes the answered objective paper is collected back. The student is not allowed to leave the examination hall. Then the descriptive question paper and the answer booklet are distributed. After 90 minutes the answered booklets are collected back.

iv. For practical subjects there shall be a continuous evaluation during the semester for 25 sessional marks and 50 end examination marks. Day-to-day work in the laboratory shall be evaluated for 25 marks by the concerned laboratory teacher based on the report of experiments/jobs. The end examination shall be conducted by the laboratory teacher and another examiner.

v. For the subject having design and/or drawing, such as Engineering Drawing, Machine Drawing and estimation, the distribution shall be 30 marks for internal evaluation and 70 marks for end examination. The Internal evaluation for sessionals will be 15 marks for day-to-day work in the class that shall be evaluated by the concerned subject teacher based on the reports/submissions prepared in the class. And there shall be two midterm exams in a Semester for a duration of 2hrs each, evenly distributed over the syllabi for 15 marks and the better of the two shall be considered as internal test marks. The sum of day to day evaluation and the internal test marks will be the final sessionals for the subject. However in the I year class, there shall be three midterm exams and the average of best two will be taken into consideration.

vi. 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 before presentation. The report and the presentation shall be evaluated by the Departmental committee consisting of Head of the
department, seminar supervisor and a senior faculty member. The seminar shall be evaluated for 50 marks and marks shall be submitted to the University along with internal marks. There shall be no external examination for seminar.

vii. Out of a total of 200 marks for the project work, 60 marks shall be for Internal Evaluation and 140 marks for the End Semester Examination (Viva-voce). The viva-voce shall be conducted by a committee consisting of HOD, Project Supervisor and an External Examiner nominated by the University. The evaluation of project work shall be conducted at the end of the IV year. The Internal Evaluation shall be made by the departmental committee, on the basis of two seminars given by each student on the topic of his project.

viii. Laboratory marks and the sessional marks awarded by the College are not final. They are subject to scrutiny and scaling by the University wherever necessary. In such cases, the sessional and laboratory marks awarded by the College will be referred to a Committee. The Committee will arrive at a scaling factor and the marks will be scaled as per the scaling factor. The recommendations of the Committee are final and binding.

ix. The laboratory records and internal test papers shall be preserved in the respective institutions as per the University norms and shall be produced to the Committees of the University as and when the same are asked for.

6. 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 in a semester/ I year.
   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. 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.
   v. A student will not be promoted to the next semester unless he satisfies the attendance requirements of the present semester / I
year, as applicable. They may seek readmission for that semester / I year when offered next.

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

7. **Minimum Academic Requirements:**
The following academic requirements have to be satisfied in addition to the attendance requirements mentioned in item no. 6

i. A student shall be deemed to have satisfied the minimum academic requirements and earned the credits allotted to each theory, practical, design, 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. In the Seminar he should secure 40%.

ii. A student shall be promoted from II to III year only if he fulfils the academic requirement of securing 40 credits from

a. One regular and one supplementary examinations of I year.
b. One regular examination of II year I semester irrespective of whether the candidate takes the end examination or not as per the normal course of study.

iii. A student shall be promoted from third year to fourth year only if he fulfils the academic requirements of securing 68 credits from the following examinations,

a. Two regular and two supplementary examinations of I year.
b. Two regular and one supplementary examinations of II year I semester.
c. One regular and one supplementary examinations of II year II semester.
d. One regular examination of III year I semester.
irrespective of whether the candidate takes the end examination or not as per the normal course of study.

And in case of getting detained for want of credits by sections ii and iii above, the student may make up the credits through supplementary exams of the above exams before the date of class work commencement of Third or Fourth year I semester respectively.
iv. A student shall register and put up minimum attendance in all 220 credits and earn all the 220 credits. Marks obtained in all 220 credits shall be considered for the calculation of percentage of marks obtained.

v. Students who fail to earn 220 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.

8. Course pattern:
   i. The entire course of study is of four academic years. The first year shall be on yearly pattern and the second, third and fourth years 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 next supplementary examination offered.
   iii. When a student is detained due to lack of credits / shortage of attendance he may be re-admitted when the semester is offered after fulfilment of academic regulations, whereas he continues to be in the academic regulations he was first admitted.

9. Transitory Regulations:
Candidates who have been detained for want of attendance or not fulfilled academic requirements or who have failed after having undergone the course in earlier regulations or have discontinued and wish to continue the course are eligible for admission into the unfinished semester from the date of commencement of class work with the same or equivalent subjects as and when subjects are offered, subject to Section 2. and they continues to be in the academic regulations they were first admitted.

10. With–holding of results:
If the candidate has any dues not paid to the university or if any case of indiscipline or malpractice is pending against him, the result of the candidate shall be withheld and he will not be allowed / promoted into the next higher semester. The issue of degree is liable to be withheld in such cases.

11. 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 220 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)

12. **Minimum Instruction Days:**
The minimum instruction days including exams for each semester / I year shall be 90/180 days respectively.

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

14. There shall be no place transfer within the Constituent Colleges.

15. **General:**
i. The academic regulations should be read as a whole for purpose of any interpretation.

ii. Malpractices rules- nature and punishments is appended.

iii. Where the words “he”, “him”, “his”, occur in the regulations, they include “she”, “her”, “hers”.

iv. In the case of any doubt or ambiguity in the interpretation of the above rules, the decision of the Vice-Chancellor is final.

v. The University may change or amend the academic regulations or syllabi at any time and the changes or amendments shall be made applicable to all the students on roles with effect from the dates notified by the University.

*_*_*
ACADEMIC REGULATIONS FOR B. TECH.
(LATERAL ENTRY SCHEME)
(Effective for the students getting admitted into II year through Lateral Entry Scheme from the Academic Year 2010-2011 and onwards)

1. **Award of B.Tech. Degree**
A student admitted in LES will be declared eligible for the award of the B. Tech Degree if he fulfils the following academic regulations:

i. Pursue a course of study for not less than three academic years and in not more than six academic years.

ii. Register for 168 credits and secure all 168 credits from II to IV year of Regular B.Tech. program

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

3. The regulations 3 to 6 are to be adopted as that of B. Tech. (Regular).

7. **Minimum Academic Requirements :**
The following academic requirements have to be satisfied in addition to the attendance requirements mentioned in item no.6

i. A student shall be deemed to have satisfied the minimum academic requirements and earned the credits allotted to each theory, practical, design, 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. For the Seminar he should secure 40% in the internal evaluation.

ii. A student shall be promoted from third year to fourth year only if he fulfils the academic requirements of 42 credits from the following 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.

irrespective of whether the candidate takes the end examination or not as per the normal course of study.

and in case of getting detained for want of credits the student may make up the credits through supplementary exams of the above
exams before the date of class work commencement of Fourth year I semester.

**8. Course Pattern**

i. The entire course of study is three academic years 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 next supplementary examination offered.

iii. When a student is detained due to lack of credits / shortage of attendance he may be re-admitted when the semester is offered after fulfilment of academic regulations, whereas he continues to be in the academic regulations he was first admitted.

**9. The regulations 9 to 10 are to be adopted as that of B. Tech. (Regular).**

**11. 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</th>
<th>Requirement</th>
<th>Marks Secured</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Class with Distinction</td>
<td>70% and above</td>
<td>From the aggregate marks secured for 168 Credits. (i.e. II year to IV year)</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)

**12. The regulations 12 to 15 are to be adopted as that of B. Tech. (Regular).** All other regulations as applicable for B. Tech. Four-year degree course (Regular) will hold good for B. Tech. (Lateral Entry Scheme)
RULES FOR
DISCIPLINARY ACTION FOR MALPRACTICES / IMPROPER
CONDUCT IN EXAMINATIONS

<table>
<thead>
<tr>
<th>Nature of Malpractices/Improper conduct</th>
<th>Punishment</th>
</tr>
</thead>
<tbody>
<tr>
<td>If the candidate:</td>
<td></td>
</tr>
<tr>
<td>1. 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>2. 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)</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</td>
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<tr>
<td>practical) in which the candidate is appearing.</td>
<td>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 and sent to the University.</td>
</tr>
<tr>
<td>3.</td>
<td>Impersonates any other candidate in connection with the examination.</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</td>
</tr>
</tbody>
</table>
paper during the examination or answer book or additional sheet, during or after the examination. 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 University 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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<tbody>
<tr>
<td>5.</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>
<td>Cancellation of the performance in that subject.</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,</td>
<td>In case of students of the college, they shall be expelled from examination halls and cancellation of their performance in that subject and all other subjects the candidate(s) has (have) already appeared and shall not be permitted to appear for the remaining examinations of the subjects of that semester/year. The candidates also are debarred and forfeit their seats. In case of outsiders, they will be handed over to the police</td>
</tr>
</tbody>
</table>
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.

and a police case is registered against them.

<table>
<thead>
<tr>
<th>7.</th>
<th>Leaves the exam hall taking away answer script or intentionally tears of the script or any part thereof inside or outside the examination hall.</th>
<th>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 University examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat.</th>
</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</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>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</td>
</tr>
</tbody>
</table>
project work and shall not be permitted for the remaining examinations of the subjects of that semester/year.

| 11. | Copying detected on the basis of internal evidence, such as, during valuation or during special scrutiny. | 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. |
| 12. | If any malpractice is detected which is not covered in the above clauses 1 to 11 shall be reported to the University for further action to award suitable punishment. | Malpractices identified by squad or special invigilators  
1. Punishments to the candidates as per the above guidelines.  
2. Punishment for institutions : (if the squad reports that the college is also involved in encouraging malpractices)  
   (i) A show cause notice shall be issued to the college.  
   (ii) Impose a suitable fine on the college.  
Shifting the examination centre from the college to another college for a specific period of not less than one year. |
Course structure for B.Tech. (Regular) I year (2009-10) for affiliated Engineering Colleges.

**ELECTRONICS AND CONTROL ENGINEERING (E.Con.E)**

<table>
<thead>
<tr>
<th>S.No</th>
<th>Course code</th>
<th>Subject</th>
<th>Th</th>
<th>Tu/Drg/Lab</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>9ABS101</td>
<td>English</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>9ABS102</td>
<td>Engineering Physics</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>9ABS103</td>
<td>Engineering Chemistry</td>
<td>2</td>
<td></td>
<td></td>
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<tr>
<td>4.</td>
<td>9ABS104</td>
<td>Mathematics – I</td>
<td>3</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>5.</td>
<td>9A05101</td>
<td>Programming in C and Data Structures</td>
<td>3</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>6.</td>
<td>9A03101</td>
<td>Engineering Drawing *</td>
<td>-</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>7.</td>
<td>9ABS105</td>
<td>Mathematical Methods</td>
<td>3</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>8.</td>
<td>9A05102</td>
<td>C Programming &amp; Data Structures Lab</td>
<td>-</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>9.</td>
<td>9A03102</td>
<td>Engineering &amp; I.T. Workshop</td>
<td>-</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>10.</td>
<td>9ABS106</td>
<td>Engineering Physics and Engineering Chemistry Lab **</td>
<td>-</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>11.</td>
<td>9ABS107</td>
<td>English Language &amp; Communication Skills Lab</td>
<td>-</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

**contact periods/week**

<table>
<thead>
<tr>
<th>Th</th>
<th>Tu/Drg/Lab</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>3 6 12</td>
<td>36</td>
</tr>
</tbody>
</table>

**Total Credits (7 Theory + 4 Labs)** 52

Th = Theory; Tu = Tutorial; Drg = Drawing & Lab = Laboratory:

* Engineering Drawing will have University External Exam.
** The Students attend the Physics lab and Chemistry lab in alternate weeks. The end exam shall be conducted separately and average of the two exams will be recorded by the University exam section.

# Students attend Engineering and IT workshop as a single lab every week and the end exam is conducted as a single lab. Sharing the Maximum marks and time for one task each from Engineering workshop and IT workshop. The sum of the marks awarded will be recorded

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR

ELECTRONICS AND CONTROL ENGINEERING (E.Con.E)

B.Tech II - I Semester

<table>
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<tr>
<th>S. No</th>
<th>Course code</th>
<th>Subject</th>
<th>Theory</th>
<th>Lab.</th>
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<td>9ABS302</td>
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Total Credits (6 Theory + 2 Labs) 28
**B.Tech II - II Semester**

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### III B. Tech. – I Semester (E.Con.E)

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Total Credits (6 Theory + 2 Labs) 28
### III B. Tech. – II Semester (E.Con.E)

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IV B. Tech. – I Semester (E.Con.E)

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IV B.Tech. – II Semester (E.Con.E)

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<td>3. Data Communications</td>
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1. INTRODUCTION:

The sweeping changes in the world have elevated English to the status of a tool of global communication and transformed it into e-English. The syllabus has been drafted to improve the competence of students in communication in general and language skills in particular. The books prescribed serve as students’ handbooks.

The teacher should focus on the skills of reading, writing, listening and speaking while using the prescribed text and exercises. The classes should be interactive. The students should be encouraged to participate in the classroom proceedings and also to write short paragraphs and essays. The main aim is to encourage two way communications in place of the one-sided lecture.

The text for non-detailed study is meant for extensive reading by the students. They may be encouraged to read some select topics on their own, which could lead into a classroom discussion. In addition to the exercises from the texts done in the class, the teacher can bring variety by using authentic materials such as newspaper articles, advertisements etc.

2. OBJECTIVES:
   a. To improve the language proficiency of the students in English with an emphasis on LSRW skills.
   b. To equip the students to study academic subjects with greater facility through theoretical and practical components of the syllabus.
   c. To develop study skills as well as communication skills in formal and informal situations.
3. SYLLABUS:

Listening Skills:
Objectives
1. To enable students to develop their listening skills so that they may appreciate its role in the LSRW skills approach to language and improve their pronunciation.
2. To equip students with necessary training in listening so that they can comprehend the speech of people of different backgrounds and dialects.

_Students should be given practice in listening and identifying the sounds of English language and to mark stress, right intonation in connected speech._

- Listening for general content
- Listening to fill up information
- Intensive listening
- Listening for specific information

Speaking Skills:
Objectives
1. To make students aware of the role of ability to speak fluent English and its contribution to their success.
2. To enable students to express themselves fluently and appropriately in social and professional contexts.

- Oral practice
- Describing objects/situations/people
- Role play – Individual/Group activities
- Just A Minute (JAM) Sessions.

(Using exercises from all units of the prescribed text)

Reading Skills:
Objectives
1. To develop an awareness in the students about the significance of silent reading and comprehension.
2. To develop the ability to guess the meanings of words from context and grasp the overall message of the text, draw inferences etc.

- Skimming the text
- Understanding the gist of an argument
- Identifying the topic sentence
- Inferring lexical and contextual meaning
• Understanding discourse features
• Recognizing coherence/sequencing of sentences

The students shall be trained in reading skills using the prescribed text for detailed study. They shall be examined in reading and answering questions using ‘unseen’ passages which may be taken from the non-detailed text or other authentic texts, such as articles from magazines/newspapers.

Writing Skills:
Objectives
1. To develop an awareness in the students the skill to write exact and formal writing
2. To equip them with the components of different forms of writing.
   • Writing sentences
   • Use of appropriate vocabulary
   • Paragraph writing
   • Coherence and cohesiveness
   • Narration / description
   • Note Making
   • Formal and informal letter writing
   • Editing a passage

4. TEXTBOOKS PRESCRIBED:
In order to improve the proficiency of the student in the acquisition of the four skills mentioned above, the following texts and course content are prescribed and divided into Eight Units:

For Detailed study: ENJOYING EVERYDAY ENGLISH,
Sangam Books (India) Pvt Ltd, Hyderabad, 2009
For Non-detailed study: INSPIRING LIVES,
Maruti Publications, Guntur, 2009

UNIT -I
a. Heaven’s Gate from ENJOYING EVERYDAY ENGLISH
b. Mokshagundam Visvesaraya from INSPIRING LIVES

UNIT -II
a. Sir C.V.Raman from ENJOYING EVERYDAY ENGLISH
b. Mother Teresa from INSPIRING LIVES
UNIT -III
a. The Connoisseur from ENJOYING EVERYDAY ENGLISH
b. Dr. Amartya Kumar Sen from INSPIRING LIVES

UNIT -IV
a. The Cuddalore Experience from ENJOYING EVERYDAY ENGLISH
b. Gertrude Elion from INSPIRING LIVES

UNIT -V
a. Bubbling Well Road from ENJOYING EVERYDAY ENGLISH
b. Vishwanathan Anand from INSPIRING LIVES

UNIT-VI
a. Odds Against Us from ENJOYING EVERYDAY ENGLISH
b. Charlie Chaplin from INSPIRING LIVES

UNIT – VII
Exercises on
Reading and Writing Skills
Reading Comprehension
Letter writing
Report writing

UNIT – VIII
Exercises on
Remedial Grammar covering Common errors in English, Subject-Verb agreement,
Use of Articles and Prepositions, Active/Passive Voice, Reported speech, Tenses
Vocabulary development covering Synonyms & Antonyms, one-word substitutes, prefixes & suffixes, Idioms & phrases, words often confused.

Evaluation: The question paper shall contain two parts, Part A containing questions from Units I- VI and Part B containing questions from units VII & VIII. The student is required to answer five full questions choosing at least one from Part B.
REFERENCES:


UNIT III- PRINCIPLES OF QUANTUM MECHANICS & ELECTRON THEORY: Waves and Particles - de-Broglie’s hypothesis – Heisenberg’s uncertainty principle - Schroedinger’s one dimensional wave equation (Time Independent) - Particle in a one dimensional potential box – Energy levels - Fermi-Dirac distribution and effect of Temperature (qualitative treatment only) – Scattering - Source of electrical resistance - Kronig-Penney model (qualitative treatment only) - energy bands – metals, semi conductors & insulators.


DIELECTRIC PROPERTIES: Introduction - Dielectric constant - Electronic, Ionic and Orientation polarizations (qualitative treatment only) - Local field - Clausius-Mossotti equation – Frequency dependence of polarisability (qualitative treatment only) – Ferro electricity- BaTio₃.

UNIT VI- SUPERCONDUCTIVITY: General properties - Meissner effect - Penetration depth - Type I and Type II superconductors - Flux quantization – Josephson effects – BCS theory - Applications of superconductors.


TEXT BOOKS:
1. Engineering Physics by P.K.Palanisamy, Scitech Publications
REFERENCES:
1. Physics Volume 2, by Halliday, Resnick and Krane; John Wiley India
2. Solid State Physics by C.Kittel, Wiley India
3. Engineering Physics by Mittal, I.K.International


UNIT IV: **Chemistry of nano materials:** Nano materials definition, properties and applications;  
**Explosives and Propellants:** Explosives, Classification, precautions during storage, blasting fuses, important explosives. Rocket propellants, classification of propellants.  
**Lubricants:** Principles and function of lubricants - Classification and properties of lubricants – Viscosity, flash and fire points, cloud and pour points, aniline point, Neutralisation Number and Mechanical Strength.

UNIT V: **Electro Chemistry:** Conductance – Equivalent Conductance – Molecular Conductance, Conductometric Titrations – Applications of Conductivity Measurements.  
**Electrochemical Cells:** Measurement of EMF, Standard electrode potential, concentration cells, batteries (Ni–Cd cell), Lithium batteries. Fuel cell: hydrogen oxygen fuel cell and methanol fuel cell  
**Insulators** – Definition, Properties and Characteristics of Insulating Materials; Engineering Applications.

UNIT VI: **Phase rule:** Definition, Terms involved in Phase Rule and Phase rule equation. Phase diagrams – one component system (water system), two component system (lead- silver system) Eutectics, heat treatment based on iron-carbon phase diagram, hardening, annealing.


UNIT VIII: **Building Materials:** Cement: composition of Portland cement, analysis, setting and hardening of cement (reactions).  
**Refractories:** Definition, Classification With Examples; Criteria of a Good Refractory Material; Causes for the failure of a Refractory Material.
TEXT BOOKS:

REFERENCE:
UNIT I – Differential equations of first order and first degree – Exact, linear and Bernoulli equations. Applications: to Newton’s law of cooling, law of natural growth and decay, orthogonal trajectories.

UNIT II – Non-homogeneous linear differential equations of second and higher order with constant coefficients with RHS term of the type $e^{ax}$, $\sin ax$, $\cos ax$, polynomials in $x$, $e^{ax}V(x)$, $xV(x)$, method of variation of parameters.

UNIT III – Rolle’s Theorem – Lagrange’s Mean Value Theorem – (excluding proof). Simple examples of Taylor’s and Maclaurin’s Series - Functions of several variables – Jacobian – Maxima and Minima of functions of two variables, Lagrangian method of Multipliers with three variables only.

UNIT IV – Radius of Curvature – Curve tracing – Cartesian, polar and parametric curves. Applications of integration to lengths, volume and surface area of solids of revolution in Cartesian and polar coordinates.

UNIT V – Multiple integral: – Double and triple integrals – Change of Variables – Change of order of integration.

UNIT VII– Differentiation and integration of Laplace transform – Application of Laplace transforms to ordinary differential equations of first and second order.


TEXT BOOKS:

REFERENCES:

UNIT II- Introduction to C Language - C Language Elements, Variable Declarations and Data Types, Executable Statements, General Form of a C Program, Expressions, Precedence and Associativity, Expression Evaluation, Operators and Expressions, Type Conversions, Decision Statements - If and Switch Statements, Loop Control Statements - while, for, do-while Statements, Nested for Loops, Other Related Statements - break, continue, goto.


UNIT V- Structure and Union – Introduction, Features of Structures, Declaration and Initialization of Structures, Structure within Structure,
Array of Structures, Pointer to Structure, Structure and Functions, typedef, Bit Fields, Enumerated Data Type, Union, Union of Structures.

UNIT VI- Files - Introduction, Streams and File Types, Steps for File Operations, File I/O Structures, Read and Write, Other File function, Searching Errors in Reading/Writing of Files, Low Level Disk I/O, Command Line Arguments, Application of Command Line Arguments, File Status functions (error handling).

Linked List - Singly Linked List, Linked List with and without header, Insertion, Deletion and Searching Operations.


TEXT BOOKS:

REFERENCES:
3. C and Data Structures, a snapshot oriented treatise with live engineering examples, Dr. N.B.Venkateswarlu, Dr. E.V.Prasad, S. Chand
UNIT I– INTRODUCTION TO ENGINEERING DRAWING:
Principles of Engineering Graphics and their Significance – Drawing Instruments and their Use – Conventions in Drawing – Lettering – BIS Conventions. Curves used in Engineering Practice:
  a) Conic Sections including the Rectangular Hyperbola – General method only.
  b) Cycloid, Epicycloids and Hypocycloid.
  c) Involutest.
  d) Helices.

UNIT II– PROJECTION OF POINTS AND LINES:
Principles of Orthographic Projection – Conventions – First and Third Angle Projections. Projections of Points, Lines inclined to one or both planes, Problems on projections, Finding True lengths & traces only.

UNIT III– PROJECTIONS OF PLANES:
Projections of regular Plane surfaces/figures, Projection of lines and planes using auxiliary planes.

UNIT IV– PROJECTIONS OF SOLIDS:
Projections of Regular Solids inclined to one or both planes – Auxiliary Views.

UNIT V– SECTIONS AND DEVELOPMENTS OF SOLIDS:
Section Planes and Sectional views of Right Regular Solids–Prism, Cylinder, Pyramid and Cone. True shapes of the sections.

Development of Surfaces of Right Regular Solids – Prisms, Cylinder, Pyramid, Cone and their Sectional parts.

UNIT VI– ISOMETRIC AND ORTHOGRAPHIC PROJECTIONS:
Principles of Isometric Projection – Isometric Scale – Isometric Views–

Conversion of Isometric projections/views to Orthographic Views – Conventions.

UNIT VII– INTERPENETRATION OF RIGHT REGULAR SOLIDS: Projections of curves of Intersection of Cylinder Vs Cylinder, Cylinder Vs Prism, Cylinder Vs Cone, Square Prism Vs Square Prism.


TEXT BOOKS:
3. Engineering Drawing, Shah and Rana, 2/e, Pearson Education.

REFERENCES:
UNIT – I


UNIT – II

UNIT – III

UNIT – IV

UNIT – V

UNIT – VI

UNIT – VII
Formation of partial differential equations by elimination of arbitrary constants and arbitrary functions – Method of separation of variables – Solutions of one dimensional wave equation, heat equation and two-dimensional Laplace’s equation under initial and boundary conditions.

UNIT – VIII

TEXT BOOKS:

REFERENCES:
3. Introduction to Numerical Analysis – S.S. Sastry Ph - I
Objectives:
- To make the student learn a programming language.
- To teach the student to write programs in C to solve the problems.
- To introduce the student to simple linear data structures such as lists, stacks, queues.

Recommended Systems/Software Requirements:
- Intel based desktop PC with ANSI C Compiler and Supporting Editors.

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

Week 3
a) 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.

**Week 4**

a) The total distance travelled by vehicle in ‘t’ seconds is given by distance \( S = ut + \frac{1}{2}at^2 \) where ‘u’ and ‘a’ are the initial velocity (m/sec.) and acceleration (m/sec\(^2\)) respectively. 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 from the user, performs the operation and then prints the result. (Consider the operators +, -, *, /, % and use Switch Statement).

**Week 5**

a) Write a C program to find both the largest and smallest number in a list of integers.

b) Write a C program that uses functions to perform the following:
   i) Addition of Two Matrices.
   ii) Multiplication of Two Matrices.

**Week 6**

a) Write a C program that uses functions to perform the following operations:
   i) To insert a sub-string in to a 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 7**

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 8**

a) Write a C program to generate Pascal’s triangle.

b) Write a C program to construct a pyramid of numbers.
Week 9
Write a C program to read in two numbers, x and n, and then compute the sum of the geometric progression:
1 + x + x^2 + x^3 + ... + 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. Find if any values of x are also illegal? If so, test for them too.

Week 10
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 to convert a Roman numeral to its decimal equivalent.

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.)
Week 13
a) Write a C programme to display the contents of a file.
b) Write a C programme to merge two files into a third file (i.e., the contents of the first file followed by those of the second are put in the third file)

Week 14
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 15
Write C programs that implement stack (its operations) using  
   i) Arrays  ii) Pointers

Week 16
Write C programs that implement Queue (its operations) using  
   i) Arrays  ii) Pointers

Week 17
Write a C program that uses Stack operations to perform the following:  
   i) Converting infix expression into postfix expression  
   ii) Evaluating the postfix expression

Week 18
Write a C program that implements the following sorting methods to sort a given list of integers in ascending order  
   i) Bubble sort  ii) Selection sort

Week 19
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 20
Write C program that implements the Quick sort method to sort a given list of integers in ascending order.
Week 21
Write C program that implement the Merge sort method to sort a given list of integers in ascending order.

Week 22
Write C programs to implement the Lagrange interpolation and Newton-Gregory forward interpolation.

Week 23
Write C programs to implement the linear regression and polynomial regression algorithms.

Week 24
Write C programs to implement Trapezoidal and Simpson methods.

REFERENCE BOOKS
ENGINEERING WORKSHOP

Objectives: The budding Engineer may turn out to be a technologist, scientist, entrepreneur, practitioner, consultant etc. There is a need to equip the engineer with the knowledge of common and newer engineering materials as well as shop practices to fabricate, manufacture or work with materials. Essentially he should know the labour involved, machinery or equipment necessary, time required to fabricate and also should be able to estimate the cost of the product or job work. Hence engineering work shop practice is included to introduce some common shop practices and on hand experience to appreciate the use of skill, tools, equipment and general practices to all the engineering students.

1. TRADES FOR EXERCISES:
   a. Carpentry shop– Two joints (exercises) involving tenon and mortising, groove and tongue: Making middle lap T joint, cross lap joint, mortise and tenon T joint, Bridle T joint from out of 300 x 40 x 25 mm soft wood stock.
   b. Fitting shop– Two joints (exercises) from: square joint, V joint, half round joint or dove tail joint out of 100 x 50 x 5 mm M.S. stock.
   c. Sheet metal shop– Two jobs (exercises) from: Tray, cylinder, hopper or funnel from out of 22 or 20 guage G.I. sheet.
   d. House-wiring– Two jobs (exercises) from: wiring for ceiling rose and two lamps (bulbs) with independent switch controls with or without looping, wiring for stair case lamp, wiring for a water pump with single phase starter.
   e. Foundry– Preparation of two moulds (exercises): for a single pattern and a double pattern.
   f. Welding – Preparation of two welds (exercises): single V butt joint, lap joint, double V butt joint or T fillet joint.
2. TRADES FOR DEMONSTRATION:
   a. Plumbing
   b. Machine Shop
   c. Metal Cutting

Apart from the above the shop rooms should display charts, layouts, figures, circuits, hand tools, hand machines, models of jobs, materials with names such as different woods, wood faults, Plastics, steels, meters, gauges, equipment, CD or DVD displays, First aid, shop safety etc. (though they may not be used for the exercises but they give valuable information to the student). In the class work or in the examination knowledge of all shop practices may be stressed upon rather than skill acquired in making the job.

REFERENCE BOOKS:

I.T. WORKSHOP

Objectives:
The IT Workshop for engineers is a training lab course. The modules include training on PC Hardware, Internet & World Wide Web and Productivity tools including Word, Excel, Power Point and Publisher.

PC Hardware introduces the students to a personal computer and its basic peripherals, the process of assembling a personal computer, installation of system software like MS Windows, Linux and the required device drivers. In addition hardware and software level troubleshooting process, tips and tricks would be covered. The students should work on a working PC (PIV or higher) to disassemble and assemble back to working condition and install Windows and Linux on the same PC. Students are suggested to work similar tasks in the Laptop scenario wherever possible.
Internet & World Wide Web module introduces the different ways of hooking the PC on to the internet from home and workplace for usage of the internet. Usage of web browsers, email, newsgroups and discussion forums would be covered. In addition, awareness of cyber hygiene, i.e., protecting the personal computer from getting infected with the viruses, worms and other cyber attacks would be introduced.

Productivity tools module would enable the students in crafting professional word documents, excel spread sheets, power point presentations and personal web sites using the Microsoft suite of office tools and LaTeX. (It is recommended to use Microsoft office 2007 in place of MS Office 2003)

PC Hardware
Week 1 – Task 1: Identify the peripherals of a computer, components in a CPU and its functions. Draw the block diagram of the CPU along with the configuration of each peripheral and submit to your instructor.

Week 2 – Task 2: Every student should disassemble and assemble the PC back to working condition. Lab instructors should verify the work and follow it up with a Viva. Also students need to go through the video which shows the process of assembling a PC. A video shall be given as part of the course content.

Week 3 – Task 3: Every student should individually install MS windows on the personal computer. Lab instructor should verify the installation and follow it up with a Viva.

Week 4 – Task 4: Every student should install Linux on the computer. This computer should have windows installed. The system should be configured as dual boot with both windows and Linux. Lab instructors should verify the installation and follow it up with a Viva

Week 5 – Task 5: Hardware Troubleshooting: Students have to be given a PC which does not boot due to improper assembly or defective peripherals. They should identify the problem and fix it to get the computer back to working condition. The work done should be verified by the instructor and followed up with a Viva
**Week 6 – Task 6: Software Troubleshooting**: Students have to be given a malfunctioning CPU due to system software problems. They should identify the problem and fix it to get the computer back to working condition. The work done should be verified by the instructor and followed up with a Viva.

**OFFICE TOOLS**

**LaTeX and Word**

**Week 7 – Word Orientation**: The mentor needs to give an overview of LaTeX and Microsoft (MS) office 2007/ equivalent (FOSS) tool word: Importance of LaTeX and MS office 2007/ equivalent (FOSS) tool Word as word Processors, Details of the four tasks and features that would be covered in each, Using LaTeX and word – Accessing, overview of toolbars, saving files, Using help and resources, rulers, format painter in word.

**Task 1 : Using LaTeX and Word** to create project certificate. Features to be covered:- Formatting Fonts in word, Drop Cap in word, Applying Text effects, Using Character Spacing, Borders and Colors, Inserting Header and Footer, Using Date and Time option in both LaTeX and Word.

**Excel**

**Week 8 - Excel Orientation**: The mentor needs to tell the importance of MS office 2007/ equivalent (FOSS) tool Excel as a Spreadsheet tool, give the details of the four tasks and features that would be covered in each. Using Excel – Accessing, overview of toolbars, saving excel files, Using help and resources.

**Task 1: Creating a Scheduler** - Features to be covered:- Gridlines, Format Cells, Summation, auto fill, Formatting Text.

**LaTeX and MS/equivalent (FOSS) tool Power Point**

**Week 9 - Task1**: Students will be working on basic power point utilities and tools which help them create basic power point presentation. Topic covered during this Exercise includes :- PPT
Orientation, Slide Layouts, Inserting Text, Word Art, Formatting Text, Bullets and Numbering, Auto Shapes, Lines and Arrows in both LaTeX and Powerpoint. Students will be given model power point presentation which needs to be replicated (exactly how it’s asked).

**Week 10 - Task 2**: Second Exercise helps students in making their presentations interactive. Topic covered during this Exercise includes: Hyperlinks, Inserting –Images, Clip Art, Audio, Video, Objects, Tables and Charts.

**Internet & World Wide Web**

**2 Week**

**Week 11 - Task 1**: Orientation & Connectivity Boot Camp: Students should get connected to their Local Area Network and access the Internet. In the process they configure the TCP/IP setting. Finally students should demonstrate, to the instructor, how to access the websites and email. If there is no internet connectivity preparations need to be made by the instructors to simulate the WWW on the LAN.

**Web Browsers, Surfing the Web**: Students customize their web browsers with the LAN proxy settings, bookmarks, search toolbars and pop up blockers.

**Week 12 - Task 2**: Search Engines & Netiquette: Students should know what search engines are and how to use the search engines. A few topics would be given to the students for which they need to search on Google. This should be demonstrated by the student to the satisfaction of instructors.

**Cyber Hygiene**: Students would be exposed to the various threats on the internet and would be asked to configure their computer to be safe on the internet. They need to first install an anti virus software, configure their personal firewall and windows update on their computer.
REFERENCES:

1. Introduction to Information Technology, ITL Education Solutions limited, Pearson Education.
2. LaTeX Companion – Leslie Lamport, PHI/Pearson.
3. Introduction to Computers, Peter Norton, 6/e Mc Graw Hill.
4. Upgrading and Repairing, PC’s 18th e, Scott Muller QUE, Pearson Education
5. Comdex Information Technology course tool kit, Vikas Gupta, WILEY Dreamtech
(9ABS106) ENGINEERING PHYSICS LAB and ENGINEERING CHEMISTRY LAB

ENGINEERING PHYSICS LAB

Any TEN of the following experiments are to be performed during the Academic year.

<table>
<thead>
<tr>
<th>Sl.No.</th>
<th>Name of the Experiment</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.</td>
<td>Dispersive power of the prism – Spectrometer.</td>
</tr>
<tr>
<td>4.</td>
<td>Determination of particle size by using a laser source.</td>
</tr>
<tr>
<td>5.</td>
<td>Determination of thickness of a thin wire using parallel fringes.</td>
</tr>
<tr>
<td>7.</td>
<td>Magnetic field along the axis of a current carrying coil – Stewart and Gee’s method.</td>
</tr>
<tr>
<td>8.</td>
<td>Numerical aperture of an optical fiber.</td>
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<tr>
<td>9.</td>
<td>Hall effect.</td>
</tr>
<tr>
<td>11.</td>
<td>Energy gap of a material of p-n junction.</td>
</tr>
<tr>
<td>12.</td>
<td>Determination of rigidity modulus of a wire material – Torsional pendulum</td>
</tr>
<tr>
<td>13.</td>
<td>Determination of dielectric constant.</td>
</tr>
<tr>
<td>15.</td>
<td>Melde’s experiment – Transverse &amp; Longitudinal modes.</td>
</tr>
</tbody>
</table>
**Equipment required:**

Spectrometer, Grating, Prism, Mercury vapour lamp, Sodium vapour lamp, Travelling Microscope, Wedge arrangement, Newton rings setup, Stewart-Gee’s apparatus, He-Ne laser source, Optical fiber, Hall effect kit, B-H loop kit, Energy gap kit (four probe method), Torsional pendulum, Dielectric constant kit, Sonometer, Melde’s apparatus

**ENGINEERING CHEMISTRY LAB**

2. Preparation of Standard Potassium Dichromate and Estimation of Copper, by Iodometry.
4. Preparation of Standard EDTA and Estimation of Copper.
5. Determination of Manganese in Steel and Iron in Cement.
6. Determination of strength of the given Hydrochloric acid against standard sodium hydroxide solution by Conductometric titration.
7. Determination of viscosity of the oils through Redwood viscometer.
10. Determination of Eutectic Temperature of binary system (Urea – Benzoic Acid).

**BOOKS:**

1. Chemistry-lab manual by Dr K.N.Jayaveera and K.B. Chandra Sekhar, S.M. Enterprises Ltd.
Equipment Required:
1. Glass ware: Pipettes, Burettes, Volumetric Flasks, Beakers, Standard flasks, Measuring jars, Boiling Test tubes, reagent bottles, (Borosil)
2. Analytical balance (keroy) (15 Nos)
3. Calorimeter
4. Bomb Calorimeter
5. Redwood viscometer No.1 & No.2
6. Conductometer/ Conductivity bridge
7. Wash bottles, test tube stands, burette stands
8. Gas cylinders with Bunsen burners
9. Chemicals: Hydrochloric acid, sodium hydroxide, EDTA, EBT indicator, fast sulfon black-f, urea, benzoic acid, methanol, Mohr’s salt, copper sulphate, magnesium sulphate, ammonia, ammonium sulphate, calcium sulphate etc.,
The Language Lab focuses on the production and practice of sounds of language and equips students with the use of English in everyday situations and contexts.

Objectives:
1. To train students to use language effectively in everyday conversations, to participate in group discussions, to help them face interviews, and sharpen public speaking skills.
2. To expose the students to a varied blend of self-instructional, learner-friendly modes of language learning.
3. To enable them to learn better pronunciation through stress on word accent, intonation, and rhythm.
4. To initiate them into greater use of the computer in resume preparation, report-writing, format-making etc.
5. To help the students cultivate the habit of reading passages from the computer monitor, thus providing them with the required ability to face computer-based competitive exams such GRE, TOEFL, GMAT 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 Stress and Intonation.
3. Situational Dialogues (giving directions etc.)
4. Speaking on the mobiles and telephone conversation
5. Role Play.
7. ‘Just A Minute’ Sessions (JAM).
8. Describing Objects / Situations / People.
9. Information Transfer
10. Debate

**Minimum Requirement:**
The English Language Lab shall have two parts:

i) **The Computer aided Language Lab** for 60 students with 60 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 T. V., a digital stereo – audio & video system and camcorder etc.

**System Requirement (Hardware component):**
*Computer network with Lan with minimum 60 multimedia systems with the following specifications:*
  i) P – IV Processor
      a) Speed – 2.8 GHZ
      b) RAM – 512 MB Minimum
      c) Hard Disk – 80 GB
  ii) Headphones of High quality

**PRESCRIBED SOFTWARE: GLOBARENA**

**Suggested Software:**
- Cambridge Advanced Learners’ English Dictionary with CD.
- The Rosetta Stone English Library
- Clarity Pronunciation Power – Part I
- Mastering English in Vocabulary, Grammar, Spellings, Composition
- Dorling Kindersley series of Grammar, Punctuation, Composition etc.
- Language in Use, Foundation Books Pvt Ltd with CD
- Learning to Speak English - 4 CDs
- Microsoft Encarta with CD
- Murphy’s English Grammar, Cambridge with CD
  - English in Mind, Herbert Puchta and Jeff Stranks with Meredith Levy, Cambridge

**Books Suggested for English Language Lab Library (to be located within the lab in addition to the CDs of the text book which are loaded on the systems):**
3. **Speaking English Effectively**, Krishna Mohan & NP Singh (Macmillan)
8. **DELTA’s key to the Next Generation TOEFL Test**, 6 audio CDS, New Age International Publishers, 2007
JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
ANANTAPUR

B.Tech. II-I Sem. (E.Con.E)  T P C
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(9ABS302) MATHEMATICS – III
(Common to EEE, ECE, E Con E, E.I.E, ECM)

UNIT – I

UNIT – II

UNIT – III
Elementary functions: Exponential, trigonometric, hyperbolic functions and their properties – General power \(Z^c\) (c is complex), principal value.

UNIT – IV

UNIT – V

UNIT – VI
Evaluation of integrals of the type
(a) improper real integrals $\int_{-\infty}^{\infty} f(x) dx$

(b) $\int_{-\infty}^{\infty} \cos(x) dx$

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

UNIT – VII

UNIT – VIII
Conformal mapping: Transformation by $e^z$, $\ln z$, $z^2$, $\sin z$, $\cos z$, Bilinear transformation - Translation, rotation, magnification and inversion – Fixed point – Cross ratio – Determination of bilinear transformation mapping three given points.

TEXT BOOKS:

REFERENCES:
2. Complex Variables – Chruchile and Brown.
UNIT – I
MULTIDISCIPLINARY NATURE OF ENVIRONMENTAL STUDIES: – Definition, Scope and Importance – Need for Public Awareness.

UNIT – II
NATURAL RESOURCES: Renewable and non-renewable resources – Natural resources and associated problems – Forest resources – Use and over – exploitation, deforestation, case studies – Timber extraction – Mining, dams and other effects on forest and tribal people – Water resources – Use and over utilization of surface and ground water – Floods, drought, conflicts over water, dams – benefits and problems – Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies – Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies. – Energy resources:

UNIT – III
ECOSYSTEMS: Concept of an ecosystem. – Structure and function of an ecosystem – Producers, consumers and decomposers – Energy flow in the ecosystem – Ecological sucession – Food chains, food webs and ecological pyramids – Introduction, types, characteristic features, structure and function of the following ecosystem:

a. Forest ecosystem.
b. Grassland ecosystem.
c. Desert ecosystem.
d. Aquatic ecosystems (ponds, streams, lakes, rivers, oceans estuaries).
UNIT – IV
BIODIVERSITY AND ITS CONSERVATION: Introduction

UNIT – V
ENVIRONMENTAL POLLUTION: Definition, Cause, effects and control measures of:
   a. Air Pollution.
   b. Water pollution.
   c. Soil pollution.
   d. Marine pollution.
   e. Noise pollution.
   f. Thermal pollution.
   g. Nuclear hazards.

SOLID WASTE MANAGEMENT: Causes, effects and control measures of urban and industrial wastes – Role of an individual in prevention of pollution – Pollution case studies – Disaster management: floods, earthquake, cyclone and landslides.

UNIT – VI

UNIT – VII

UNIT – VIII
FIELD WORK : Visit to a local area to document environmental assets River/forest grassland/hill/mountain – Visit to a local polluted site-Urban/Rural/Industrial/Agricultural Study of common plants, insects, birds – river, hill slopes, etc..

TEXT BOOKS :
(1) Text book of Environmental Studies for Undergraduate Courses by Erach Bharucha for University Grants Commission, Universities Press.
(2) Environmental Studies by R.Rajagopalan, Oxford University Press.
(3) Environmental Studies by Benny Joseph,Mc.graHill Publications.

REFERENCES :
(1) Text book of Environmental Sciences and Technology by M.Anji Reddy, BS Publication.
(2) Comprehensive Environmental studies by J.P.Sharma, Laxmi publications.
(3) Environmental sciences and engineering – J. Glynn Henry and Gary W. Heinke – Printice hall of India Private limited.
(4) Introduction to Environmental engineering and science by Gilbert M. Masters and Wendell P. Ela - Printice hall of India Private limited.
(5) Environmental Studies by Anindita Basak-Pearson Education.
Objective:
This course introduces the basic concepts of circuit analysis which is the foundation for all subjects of the Electrical Engineering discipline. The emphasis of this course if laid on the basic analysis of circuits which includes single phase circuits, magnetic circuits, theorems, transient analysis and network topology.

UNIT-I Introduction to Electrical Circuits
Circuit concept – R-L-C parameters-Voltage and Current sources-Independent and dependent sources-source transformation-Voltage - Current relationship for passive elements (for different input signals-square, ramp, saw tooth, triangular)

UNIT-II Network Ananlysis
Kirchoff’s laws – network reduction techniques-series, parallel, series parallel, star-to-delta, delta-to-star transformation, Nodal analysis, mesh analysis, super node and super mesh for D.C excitations.

UNIT-III Single Phase A.C Circuits
R.M.S, Average values and form factor for different periodic wave forms – sinusoidal alternating quantities – Phase and Phase difference – Complex and polar forms of representations, J-notation, Steady state analysis of R,L and C (in series, parallel and series parallel combinations) with sinusoidal excitation- Concept of power factor-Concept of Reactance, Impedance, Susceptance and Admittance-Real and Reactive power, Complex Power.

UNIT-IV Locus diagrams & Resonance
Locus diagrams - series R-L, R-C, R-L-C and parallel combination with variation of various parameters - Resonance-series, parallel circuits, concept of band width and Q factor.
UNIT-V Magnetic Circuits
Magnetic circuits-Faraday’s laws of electromagnetic induction-concept of self and mutual inductance, dot convention-coefficient of coupling, Composite magnetic circuit-analysis of series and parallel magnetic circuits

UNIT-VI Network topology
Graph , Tree, Basic cut-set and Basic Tie-set matrices for planar networks – Loop and Nodal methods of analysis of Networks with dependent & independent voltage and current sources – Duality & Dual networks.

UNIT-VII Network theorems -I
Thevenin’s, Norton’s, Maximum Power Transfer and Millman’s theorems for D.C and sinusoidal excitations.

UNIT-VIII Network theorems - II
Tellegen’s, Superposition, Reciprocity and compensation theorems for D.C and sinusoidal excitations.

TEXT BOOKS:
1. Circuits & Networks by A. Sudhakar and Shyammohan S Palli, Tata McGraw- Hill.
2. Electric Circuits by N.Sreenivasulu, REEM Publications.

REFERENCE BOOKS:
2. Basic circuit analysis by D.R. Cunningham & J.A Stuller, Jaico Publications.
(9A04303) PROBABILITY THEORY AND STOCHASTIC PROCESSES
(Common to ECE, E Con E, EIE, ECM)

UNIT I
PROBABILITY:

UNIT II
THE RANDOM VARIABLE:

UNIT III
OPERATION ON ONE RANDOM VARIABLE – EXPECTATIONS:
UNIT IV
MULTIPLE RANDOM VARIABLES:

UNIT V
OPERATIONS ON MULTIPLE RANDOM VARIABLES:

UNIT VI
STOCHASTIC PROCESSES:

UNIT VII
STOCHASTIC PROCESSES-TEMPORAL CHARACTERISTICS
UNIT VIII
STOCHASTIC PROCESSES – SPECTRAL CHARACTERISTICS:

TEXT BOOKS:

REFERENCES:
B.Tech. II-I Sem. (E.Con.E)  
T  P  C  
4  0  4  

(9A04301) ELECTRONIC DEVICES AND CIRCUITS  
(Common to CSE, CSSE, IT, ECE, E Con E, ECM, EIE, EEE)  

UNIT- I  
PN JUNCTION DIODE:  

UNIT- II  
RECTIFIERS AND FILTERS : PN Junction as a Rectifier, Half wave rectifier, ripple factor, full wave rectifier, Bridge Rectifier, Harmonic components in a rectifier circuit, Inductor filter, Capacitor filter, L-section filter, Π-section filter, Use of Zener Diode as a Regulator, Problems on rectifier circuits, and voltage regulator.

UNIT- III  

UNIT- IV  
UNIT- V
FIELD EFFECT TRANSISTOR:

UNIT- VI
FET AMPLIFIERS:
Common Source, and Common Drain Amplifiers using FET, Generalized FET Amplifier, Biasing of FET, FET as Voltage Variable Resistor, Comparison between BJT and FET.

UNIT-VII
SMALL SIGNAL ANALYSIS OF BJT AMPLIFIERS:
BJT Modeling, Hybrid Modeling, Determination of h-Parameters from Transistor Characteristics, Measurement of h-Parameters, Analysis of CE, CB and CC configurations using h-Parameters, Comparision of CB, CE and CC configurations, Simplified Hybrid Model, Millers Theorem, Dual of Millers Theorem.

UNIT-VIII
SPECIAL PURPOSE ELECTRONIC DEVICES:

TEXT BOOKS:
REFERENCES:
3. Introduction to Electronic Devices and Circuits-Rober T.Paynter, PE
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, Exponential and sinusoidal signals, Concepts of Impulse function, Unit step function, Signum function.

UNIT II
FOURIER SERIES REPRESENTATION OF PERIODIC SIGNALS: Representation of Fourier series, Continuous time periodic signals, properties of Fourier series, Dirichlet’s conditions, Trigonometric Fourier series and Exponential Fourier series, Complex Fourier spectrum.

UNIT III
FOURIER TRANSFORMS: Deriving Fourier Transform from Fourier series, Fourier transform of arbitrary signal, Fourier transform of standard signals, Fourier transform of periodic signals, properties of Fourier transforms, Fourier transforms involving impulse function and Signum function, Introduction to Hilbert Transform.

UNIT IV
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. Distortion less transmission through a system, Signal bandwidth, system bandwidth, Ideal LPF, HPF and BPF characteristics, Causality and Poly-Wiener criterion for physical realization, Relationship between bandwidth and rise time.
UNIT V
SAMPLING: 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 sampling.

UNIT VI
CONVOLUTION AND CORRELATION OF SIGNALS: Concept of convolution in time domain and Frequency domain, Graphical representation of convolution, Convolution property of Fourier transforms. Cross correlation and auto correlation of functions, Properties of correlation function, Energy density spectrum, Parseval’s theorem, Power density spectrum, Relation between auto correlation function and energy/power spectral density function, Relation between convolution and correlation, Detection of periodic signals in the presence of noise by correlation, Extraction of signal from noise by filtering.

UNIT VII
LAPLACE TRANSFORMS: Review of Laplace transforms (L.T), Partial fraction expansion, Inverse Laplace transform, Concept of region of convergence (ROC) for Laplace transforms, Constraints on ROC for various classes of signals, Properties of L.T’s relation between L.T’s, and F.T. of a signal. Laplace transform of certain signals using waveform synthesis.

UNIT VIII
Z–TRANSFORMS: Fundamental difference between continuous and discrete time signals, discrete time signal representation using complex exponential and sinusoidal components, Periodicity of discrete time using complex exponential signal, Concept of z-transform of a discrete sequence, Distinction between Laplace, Fourier and z-transforms, Region of convergence in z-transform, constraints on ROC for various classes of signals, Inverse z-transform, properties of z-transforms.

TEXT BOOKS:

REFERENCES:
ELECTRONIC WORKSHOP PRACTICE (in 3 lab sessions):
1. Identification, Specifications, Testing of R, L, C Components (Colour Codes), Potentiometers, Switches (SPDT, DPDT, and DIP), Coils, Gang Condensers, Relays, Bread Boards, PCBs
2. Identification, Specifications and Testing of Active Devices, Diodes, BJT, Lowpower JFET, MOSFET, Power Transistors, LEDs, LCD, SCR, UJT.
3. Study and operation of
   - Multimeters (Analog and Digital)
   - Function Generator
   - Regulated Power Supplies
   - Study and Operation of CRO.
(For Laboratory examination – Minimum of 10 experiments)
1. Forward and Reverse bias characteristics of PN Junction diode.
2. Zener diode characteristics and Zener as Voltage Regulator.
3. Input and Output characteristics of Transistor in CB Configuration.
4. Input and Output characteristics of Transistor in CE Configuration.
5. Half Wave Rectifier With and without filter.
6. Full wave Rectifier With and without filter.
7. FET characteristics.
12. SCR Characteristics.
13. UJT Characteristics.
Equipment required for Laboratories:

1. Regulated Power supplies (RPS) - 0-30v.
2. CROs - 0-20M Hz.
3. Function Generators - 0-1 M Hz.
4. Multimeters -
5. Decade Resistance Boxes/Rheostats -
6. Decade Capacitance Boxes -
7. Micro Ammeters (Analog or Digital) - 0-20 µA, 0-50µA, 0-100µA, 0-200µA.
8. Voltmeters (Analog or Digital) - 0-50V, 0-100V, 0-250V.
9. Electronic Components - Resistors, Capacitors, BJT, LCDs, SCR, UJT, FET, LEDs, MOSFET, Diodes (Ge & Si type), transistors (NPN & PNP type)
List of Experiments:
1. Basic Operations on Matrices.
2. Generation of Various signals and Sequences (Periodic and Aperiodic), Such as Unit Impulse, Unit Step, Square, Saw Tooth, Triangular, Sinusoidal, Ramp, sinc function.
3. Operations on Signals and Sequences such as Addition, Multiplication, Scaling, Shifting, Folding, Computation of Energy and Average Power.
4. Finding the Even and Odd Parts of Signal or Sequence and Real and Imaginary Parts of Signal.
5. Convolution between Signals and Sequences.
6. Autocorrelation and Cross correlation between Signals and Sequences.
12. Locating Zeros and Poles, and plotting the Pole-Zero maps in S-Plane and Z-Plane for the given Transfer Functions.
17. Verification of Weiner- Khinchine Relations.

Using Licensed MATLAB of version 7.0 and above
UNIT I: INTRODUCTION TO MANAGERIAL ECONOMICS
Definition, nature and scope of managerial economics- relation with other disciplines- Demand Analysis: Demand Determinants, Law of Demand and its exceptions.

UNIT II: ELASTICITY OF DEMAND
Definition, Types, Measurement and Significance of Elasticity of Demand. Demand forecasting, factors governing demand forecasting, methods of demand forecasting (Survey methods, Statistical methods, Expert opinion method, Test marketing, Controlled experiments, Judgmental approach to Demand Forecasting).

UNIT III: THEORY OF PRODUCTION AND COST ANALYSIS
Production Function – Isoquants and Isocosts, MRTS, least cost combination of inputs, Cobb-Douglas production function, laws of returns, internal and external economies of scale.
Cost Analysis: Cost concepts, opportunity cost, fixed Vs variable costs, explicit costs Vs Implicit costs, out of pocket costs Vs Imputed costs. Break-Even Analysis (BEA) - Determination of Break Even Point (Simple Problems)- Managerial significance and limitations of BEA.

UNIT IV: INTRODUCTION TO MARKETS AND PRICING POLICIES
Market structures: Types of competition, features of perfect competition, monopoly- monopolistic competition. Price-Output determination under perfect competition and monopoly - Methods of Pricing-cost plus pricing, marginal cost, limit pricing, skimming pricing, bundling pricing, sealed bid pricing and peak load pricing.
UNIT V: BUSINESS ORGANISATIONS AND NEW ECONOMIC ENVIRONMENT
Characteristic features of business, features and evaluation of sole proprietorship, partnership, Joint Stock Company, public enterprises and their types, changing business environment in post-liberalization scenario.

UNIT VI: CAPITAL AND CAPITAL BUDGETING
Capital and its significance, types of capital, estimation of fixed and working capital requirements, methods and sources of raising finance. Nature and scope of capital budgeting, features of capital budgeting proposal, methods of capital budgeting – payback method, accounting rate of return (ARR) and Net present value method (Simple problems).

UNIT VII: INTRODUCTION TO FINANCIAL ACCOUNTING

UNIT VIII: FINANCIAL ANALYSIS THROUGH RATIOS
Computation, Analysis and Interpretation of financial statements through Liquidity Ratios (Current and Quick ratio), Activity ratios (Inventory Turnover Ratio and Debtor Turnover Ratio), Capital Structure Ratios (Debt- Equity Ratio, Interest Coverage Ratio) and Profitability ratios (Gross Profit Ratio, Net Profit Ratio, Operating Ratio, P/E Ratios and EPS), Du Pont Chart.

TEXT BOOKS:

REFERENCES
B.Tech. II-IISem. (E.Con.E)  

T  P  C  
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(9A02401) PRINCIPLES OF ELECTRICAL ENGINEERING  
(Common to ECE, E Con E, EIE, ECM)  

UNIT I  
TRANSIENT ANALYSIS (First and Second Order Circuits)  

UNIT II  
Two Port Networks  
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, Iterative Impedence, Illustrative problems.  

UNIT III  
Filters  

UNIT IV  
Symmetrical Attenuators  
Symmetrical Attenuators – T-type Attenuator, π-type Attenuator, Bridged T type Attenuator, Lattice Attenuator.  

UNIT V  
DC Generators  
Principle of Operation of DC Machines, EMF equation, Types of Generators, Magnetisation and Load Characteristics of DC Generators.
UNIT VI
DC Motors
DC Motors, Type of DC Motors, Characteristics of DC Motors, Losses and Efficiency, Swinburne’s Test, Speed Control of DC Shunt Motor, Flux and Armature Voltage Control Methods.

UNIT VII
Transformers and Their Performance
Principle of Operation of Single Phase transformer, Types, Constructional Features, Phasor Diagram on NLoad and Load, Equivalent Circuit, Losses and Efficiency of Transformer and Regulation, OC and SC Tests, Predetermination of Efficiency and Regulation(Simple Problems).

UNIT VIII
Special Machines
Principle of Operation, Shaded Pole motors, Capacitor motors, AC Servomotor, AC Tachometers, Synchros, Stepper Motors, Characteristics.

Test Books:

Reference Books:
B.Tech. II-IISem. (E.Con.E)  

(9A04402) ELECTRONIC CIRCUITS ANALYSIS  
(Common to ECE, E Con E, EIE)  

UNIT I  
SINGLE STAGE AMPLIFIERS  
Classification of Amplifiers- Distortion in amplifiers, Analysis of CE, CC and CB configurations with simplified Hybrid Model, Analysis of CE amplifier with Emitter Resistance and Emitter Follower, Design of Single stage RC Coupled Amplifier Using BJT.  

UNIT II  
MULTI STAGE AMPLIFIERS  
Analysis of Cascaded RC Coupled BJT Amplifiers, Cascade Amplifier, Darlington Pair, Different Coupling Schemes used in Amplifiers- RC Coupled Amplifier, Direct and Transformer Coupled Amplifiers.  

UNIT III  
BJT FREQUENCY RESPONSE  
Logarithms, Decibels, General Frequency considerations, Frequency Response of BJT Amplifier, Analysis at Low and High Frequencies, Effect of Coupling and bypass Capacitors, The Hybrid-pi (π)- Common Emitter Transistor Model, CE short Circuit Current gain, Current gain with Resistive Load, Single Stage CE Transistor Amplifier response, Gain-Bandwidth Product, Emitter follower at higher frequencies.  

UNIT IV  
MOSFET AMPLIFIERS  
Basic Concepts, MOSFET small signal Model, Common Source Amplifier with resistive load, Diode connected Load and Current Source Load, Source follower, Common gate stage cascade and folded cascade Amplifier and their Frequency Response.
UNIT V
FEEDBACKAMPLIFIERS

UNIT VI
OSCILLATORS
Conditions for Oscillations, RC and LC type Oscillators, Crystal Oscillators, Frequency and Amplitude Stability of Oscillators, Generalized Analysis of LC Oscillators, Quartz, Hartley and Colpitts Oscillators, RC-Phase shift and Wien-Bridge Oscillators.

UNIT VII
LARGESIGNALAMPLIFIERS

UNIT VIII
TUNEDAMPLIFIERS

TEXT BOOKS:
1. Integrated Electronics – Jacob Millman, Christos C Halkias, McGrawhill.
REFERENCE BOOKS:
JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
ANANTAPUR

B.Tech. II-IISem. (E.Con.E) T P C

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(9A04404) PULSE AND DIGITAL CIRCUITS
(Common to ECE, E Con E, EIE, ECM)

UNIT I
LINEAR WAVESHAPING

UNIT II
NON-LINEAR WAVE SHAPING
Diode clippers, Transistor clippers, Clipping at two independent levels, Comparators, applications of voltage comparators, clamping operation, clamping circuits taking source and Diode resistances into account, Clamping circuit theorem, practical clamping circuits, Effect of diode characteristics on clamping voltage, Synchronized Clamping.

UNIT III
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 variations of Saturation Parameters, Transistor-Switching Times, Silicon- Controlled- Switch Circuits.

UNIT IV
MULTIVIBRATOR CIRCUITS
Analysis and Design of Bistable, Monostable, Astable Multivibrators and Schmitt trigger circuit using BJT.
UNIT V
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 Improvements.

UNIT VI
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, Application of Sampling Gates.

UNIT VII
SYNCHRONIZATION AND FREQUENCY DIVISION
Pulse Synchronization of relaxation Devices, Frequency division in sweep circuit, Stability of relaxation Devices, Astable relaxation circuits, Monostable relaxation circuits, Synchronization of a sweep circuit with symmetrical signals, Sine wave frequency division with a sweep circuit, A Sinusoidal Divider using Regeneration and Modulation.

UNIT VIII
REALIZATION OF LOGIC GATES USING DIODES & TRANSISTORS
AND, OR, & NOT gates using Diodes, and Transistors, DCTL, RTL. DTL, TTL, and CMOS Logic Families, and Comparison between the logic families.

TEXT BOOKS:
3. Integrated Electronics – Jacob Millman, Christos C Halkias.
REFERENCES:
3. Pulse Circuits – Michel
(9A04401) SWITCHING THEORY AND LOGIC DESIGN
(Common to ECE, E Con E, EIE, ECM)

UNIT I
NUMBER SYSTEMS & CODES
Philosophy of number systems – complement representation of Negative numbers, Binary arithmetic, Binary codes, Error Detecting & Error Correcting codes, Hamming codes.

UNIT II
BOOLEAN ALGEBRA AND SWITCHING FUNCTIONS
Fundamental postulates of Boolean Algebra, Basic theorems and properties, Switching Functions, Canonical and Standard forms, Algebraic simplification Digital Logic Gates, properties of XOR gates, Universal Gates, Multilevel NAND/NOR realizations.

UNIT III
MINIMIZATION OF SWITCHING FUNCTIONS

UNIT IV
COMBINATIONAL LOGIC DESIGN

UNIT V
PROGRAMMABLE LOGIC DEVICES, THRESHOLD LOGIC
Basic PLD’s- ROM, PROM, PLA, PAL Realization of Switching functions using PLD’s. Capabilities and limitations of Threshold gate, Synthesis of Threshold functions, Multigate Synthesis.
UNIT VI
SEQUENTIAL CIRCUITS - I
Classification of sequential circuits (Synchronous, Asynchronous, Pulse mode, Level mode with examples) Basic Flip-Flops, Triggering and Excitation Tables. Steps in Synchronous Sequential Circuit Design. Design of modulo-N Ring & Shift counters, Serial Binary Adder, Sequence Detector.

UNIT VII
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.

UNIT VIII
ALGORTHIMIC 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.

TEXTBOOKS:

REFERENCES:
1. An Engineering Approach to Digital Design – Fletcher, PHI.
UNIT – I:

UNIT – II:

UNIT – III:

UNIT - IV

UNIT – V
Bridges: AC Bridges – measurement of inductance, Maxwell’s bridge, Anderson bridge, measurement of capacitance, Schering bridge, measurement of impedance – Kelvin’s bridge, Wheat Stone bridge, HF bridges, problems of shielding, and grounding, Q-meter.

UNIT – VI
Frequency Counters: Basic Principle, errors associated with counter, Different modes of operations: Frequency, Time, Time Period, Average
time period, Totalizing, Frequency synthesizer, Wave meters, Wave
Analyzers, Output Power meter.

UNIT – VII
Electron Dynamics & Oscilloscopes: Motion of Electron in Electric and
Magnetic fields, Electrostatic and Magnetic focusing, Deflection
sensitivity in both cases, CRO operation, CRT characteristics, probes,
Time base sweep modes, Trigger generator, Vertical amplifier, modes
of operation, A, B, alternate & chop modes, sampling oscilloscopes,
storage oscilloscope, Standard specifications of CRO, Synchronous
selector circuits, Lissajous Figures.

UNIT – VIII
Spectrum analyzers, Different types of spectrum analyzer, Recorders,
Introduction to magnetic recording techniques & X-Y plotters. Display
Devices and Display Systems, Logic Analyzers – State & time
referenced data capture.

TEXT BOOKS:
1. Modern Electronic Instrumentation and Measurement techniques-
   Albert D.Helfrick, William D. Cooper-PHI.
2. Electronic Instrumentation and Measurements- David A. Bell-PHI.

REFERENCES:
1. Measuring Systems, Application and Design – by E.O. Doebelin,
   McGraw Hill.
2. Electrical and Electronic Measurements – by Shawney, Khanna
   Publ.
4. Electronic Measurements and Instrumentation-Oliber-case-TMH.
List of Experiments (12 experiments to be done):

I) Design and Simulation in Simulation Laboratory using Any Simulation Software.
(Minimum of 6 Experiments):

1. Common Emitter Amplifier
2. Common Source Amplifier
3. A Two Stage RC Coupled Amplifier.
4. Current shunt and Voltage Series Feedback Amplifier
5. Cascade 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 (6 Experiments)

   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
   5. Darlington Pair.
   6. MOSFET Amplifier

III) Equipments required for Laboratories:

110
1. For software simulation of Electronic circuits
   i) Computer Systems with latest specifications.
   ii) Connected in LAN (Optional).
   iii) Operating system (Windows XP).
   iv) Suitable Simulations software.

2. For Hardware simulations of Electronic Circuits
   i) Regulated Power Supply (0-30V)
   ii) CRO’s
   iii) Functions Generators.
   iv) Multimeters.
   v) Components.
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ANANTAPUR

B.Tech. II-IISem. (E.Con.E)  
(9A0240) ELECTRICAL ENGINEERING LAB  
(Common to ECE, E Con E, EIE, ECM)

PART – A
1. Verification of KVL and KCL.
2. Serial and Parallel Resonance – Timing, Resonant frequency, Bandwidth and Q-factor determination for RLC network.
4. Two port network parameters – Z-Y Parameters, chain matrix and analytical verification.
5. Two port network parameters – ABCD and h-Parameters.
6. Verification of Superposition and Reciprocity theorems.
7. Verification of maximum power transfer theorem. Verification on DC, verification on AC with Resistive and Reactive loads.
8. Experimental determination of Thevenin’s and Norton’s equivalent circuits and verification by direct test.

PART – B
2. Swinburne’s Test on DC shunt machine (Predetermination of efficiency of a given DC Shunt machine working as motor and generator).
4. OC & SC tests on Single-phase transformer (Predetermination of efficiency and regulation at given power factors and determination of equivalent circuit).
5. Load test on Single Phase transformer.

Note: Any 12 of the above experiments are to be conducted.
Objective:
In this course it is aimed to introduce to the students the principles and applications of control systems in everyday life. The basic concepts of block diagram reduction, time domain analysis solutions to time invariant systems and also deals with the different aspects of stability analysis of systems in frequency domain and time domain.

UNIT I
INTRODUCTION

UNIT II
TRANSFER FUNCTION REPRESENTATION
Transfer Function of DC Servo motor - AC Servo motor- Synchro transmitter and Receiver - Block diagram algebra – Signal flow graph - Reduction using Mason’s gain formula.

UNIT III
TIME RESPONSE ANALYSIS
UNIT IV
STABILITY ANALYSIS IN S-DOMAIN
The concept of stability – Routh’s stability criterion – qualitative stability and conditional stability – limitations of Routh’s stability. The root locus concept - construction of root loci-effects of adding poles and zeros to G(s)H(s) on the root loci.

UNIT V
FREQUENCY RESPONSE 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.

UNIT VI
STABILITY ANALYSIS IN FREQUENCY DOMAIN
Polar Plots-Nyquist Plots-Stability Analysis.

UNIT VII
CLASSICAL CONTROL DESIGN TECHNIQUES
Compensation techniques – Lag, Lead, Lead-Lag Controllers design in frequency Domain, P, PD, PI, PID Controllers.

UNIT VIII
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 its Properties.

TEXT BOOKS:
REFERENCES:

Objective:
With the advent of semiconductor devices, revolution is taking place in the power transmission distribution and utilization. This course introduces the basic concepts of power semiconductor devices, converters and choppers and their analysis.

UNIT – I
POWER SEMI CONDUCTOR DEVICES
Thyristors – Silicon Controlled Rectifiers (SCR’s) – BJT – Power MOSFET – Power IGBT and their characteristics and other thyristors – Basic theory of operation of SCR – Static characteristics – Turn on and turn off methods - Dynamic characteristics of SCR - Turn on and Turn off times - Salient points.

UNIT – II
DEVICES AND COMMUTATION CIRCUITS

UNIT – III
SINGLE PHASE HALF CONTROLLED CONVERTERS
Phase control technique – Single phase Line commutated converters – Mid point and Bridge connections – Half controlled converters with Resistive, RL loads and RLE load– Derivation of average load voltage and current -Active and Reactive power inputs to the converters without and with Free wheeling Diode – Numerical problems.
UNIT – IV
SINGLE PHASE FULLY CONTROLLED CONVERTERS
Fully controlled converters, Mid point and Bridge connections with Resistive, RL loads and RLE load – Derivation of average load voltage and current – Line commutated inverters -Active and Reactive power inputs to the converters without and with Free wheeling Diode, Effect of source inductance – Derivation of load voltage and current – Numerical problems.

UNIT – V
THREE PHASE LINE COMMUTATED CONVERTERS
Three phase converters – Three pulse and six pulse converters – Mid point and bridge connections average load voltage With R and RL loads – Effect of Source inductance–Dual converters (both single phase and three phase) - Waveforms –Numerical Problems.

UNIT – VI
AC VOLTAGE CONTROLLERS & CYCLO CONVERTERS

UNIT – VII
CHOPPERS

UNIT – VIII
INVERTERS
Inverters – Single phase inverter – Basic series inverter – Basic parallel Capacitor inverter bridge inverter – Waveforms – Simple forced
commutation circuits for bridge inverters – Mc Murray and Mc Murray – Bedford inverters - Voltage control techniques for inverters Pulse width modulation techniques – Numerical problems.

TEXT BOOKS:


REFERENCES:

UNIT I
INTRODUCTION TO MEASUREMENT SYSTEMS:
General concepts and terminology, measurement systems, sensor classification, general input-output configuration, methods of correction. Performance characteristics: static characteristics of measurement systems, accuracy, precision, sensitivity, other characteristics: linearity, resolution, systematic errors, random errors, dynamic characteristics of measurement systems: zero-order, first-order, and second-order measurement systems and response.

UNIT II
RESISTIVE SENSORS:
Potentiometers, strain gages and types, resistive temperature detectors (RTDs), thermistors, magneto resistors, light-dependent resistors (LDRs).

UNIT III
SIGNAL CONDITIONING FOR RESISTIVE SENSORS:

UNIT IV
REACTANCE VARIATION AND ELECTROMAGNETIC SENSORS:
Capacitive sensors – variable & differential, inductive sensors - reluctance variation, eddy current, linear variable differential transformers (LVDTs), variable transformers: synchros, resolvers, inductosyn, magneto elastic sensors, electromagnetic sensors - sensors based on faraday’s law, hall effect sensors.
UNIT V
SIGNAL CONDITIONING FOR REACTANCE VARIATION SENSORS:
Problems and alternatives, ac bridges, carrier amplifiers - application to the LVDT, variable oscillators, resolver-to- digital and digital-to- resolver converters.

UNIT VI
SELF-GENERATING SENSORS:
Thermoelectric sensors, piezoelectric sensors, Pyroelectric sensors, photovoltaic sensors, electrochemical sensors.

UNIT VII
SIGNAL CONDITIONING FOR SELF-GENERATING SENSORS:
Chopper and low-drift amplifiers, offset and drifts amplifiers, electrometer amplifiers, charge amplifiers, noise in amplifiers.

UNIT VIII
DIGITAL SENSORS:
Position encoders, variable frequency sensors - quartz digital thermometer, vibrating wire strain gages, vibrating cylinder sensors, saw sensors, digital flow meters, Sensors based on semiconductor junctions: thermometers based on semiconductor junctions, magneto diodes and magneto transistors, photodiodes and phototransistors, sensors based on mosfet transistors, charge-coupled sensors - types of ccd imaging sensors, ultrasonic-based sensors, fiber-optic sensors.

TEXT BOOK:

REFERENCES:
2. Instrument Transducers – An Introduction to Their Performance and Design – by Herman K.P. Neubrat, Oxford University Press.
UNIT I

UNIT II
LINEAR & NON-LINEAR APPLICATIONS OF OP-AMPS:
Inverting and Non-inverting amplifier, Integrator and differentiator, Difference amplifier, Instrumentation amplifier, AC amplifier, V to I, I to V converters, Buffers. Non-Linear function generation, Comparators, Multivibrators, Triangular and Square wave generators, Log and Anti log amplifiers, Precision rectifiers.

UNIT III
TIMERS & PHASE LOCKED LOOPS: Introduction to 555 timer, functional diagram, Monostable and Astable operations and applications, Schmitt Trigger. PLL - introduction, block schematic, principles and description of individual blocks, 565 PLL, Applications of PLL – frequency multiplication, frequency translation, AM, FM & FSK.

UNIT IV
CMOS LOGIC: Introduction to logic families, CMOS logic, CMOS steady state electrical behavior, CMOS dynamic electrical behavior, CMOS logic families.
UNIT V
BIPOLAR LOGIC AND INTERFACING: Bipolar logic, Transistor logic, TTL families, CMOS/TTL interfacing, low voltage CMOS logic and interfacing, Emitter coupled logic, Comparison of logic families, Familiarity with standard 74XX and CMOS 40XX series-ICs – Specifications.

UNIT VI
THE VHDL HARDWARE DESCRIPTION LANGUAGE: Design flow, program structure, types and constants, functions and procedures, libraries and packages. Structural design elements, data flow design elements, behavioral design elements, time dimension and simulation synthesis.

UNIT VII
COMBINATIONAL LOGIC DESIGN: Decoders, encoders, three state devices, multiplexers and demultiplexers, Code Converters, EX-OR gates and parity circuits, comparators, adders & subtractors, ALUs, Combinational multipliers, VHDL modes for the above ICs.

UNIT VIII
SEQUENTIAL LOGIC DESIGN: Latches and flip-flops, PLDs, counters, shift register, and their VHDL models, synchronous design methodology, impediments to synchronous design.

TEXT BOOKS:

REFERENCES:
UNIT I
INTRODUCTION: Block diagram of Electrical communication system, Radio communication: Types of communications, Analog, pulse and digital Types of signals, Fourier Transform for various signals, Fourier Spectrum, Power spectral density, Autocorrelation, correlation, convolution.

UNIT II
AMPLITUDE MODULATION: Need for modulation, Types of Amplitude modulation, AM, DSB SC, SSB SC, Power and BW requirements, generation of AM, DSB SC, SSB SC, Demodulation of AM: Diode detector, Product demodulation for DSB SC & SSB SC.

UNIT III
ANGLE MODULATION: Frequency & Phase modulations, advantages of FM over AM, Bandwidth consideration, Narrow band and Wide band FM, Comparison of FM & PM.

UNIT IV
PULSE MODULATIONS: Sampling, Nyquist rate of sampling, Sampling theorem for Band limited signals, PAM, regeneration of base band signal, PWM and PPM, Time Division Multiplexing, Frequency Division Multiplexing, Asynchronous Multiplexing.

UNIT V
DIGITAL COMMUNICATION: Advantages, Block diagram of PCM, Quantization, effect of quantization, quantization error, Base band digital signal, DM, ADM, ADPCM and comparison.

UNIT VI
DIGITAL MODULATION: ASK, FSK, PSK, DPSK, QPSK demodulation, coherent and incoherent reception, Modems.
UNIT VII
INFORMATION THEORY: Concept of information, rate of information and entropy, Source coding for optimum rate of information, Coding efficiency, Shanon-Fano and Huffman coding.

UNIT VIII
ERROR CONTROL CODING: Introduction, Error detection and correction codes, block codes, convolution codes.

TEXT BOOKS:


REFERENCES

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
THE Z – TRANSFORMS

UNIT III
Z-PLANE ANALYSIS OF DISCRETE-TIME CONTROL SYSTEM
Z-Transform method for solving difference equations; Pulse transfer function, block diagram analysis of sampled – data systems, mapping between s-plane and z-plane.

UNIT IV
STATE SPACE ANALYSIS
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.

UNIT V
CONTROLLABILITY AND OBSERVABILITY
UNIT–VI
STABILITY ANALYSIS

UNIT–VII
DESIGN OF DISCRETE TIME CONTROL SYSTEM BY CONVENTIONAL METHODS
Transient and steady state response Analysis – Design based on the frequency response method – Bilinear Transformation and Design procedure in the w-plane, Lead, Lag and Lead-Lag compensators and digital PID controllers.

UNIT–VIII
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.

TEXT BOOKS:

REFERENCES:
2. Digital Control and State Variable Methods by M. Gopal, TMH.
JAWAHRLAL NEHRU TECHNOLOGICAL UNIVERSITY
ANANTAPUR

(9A10507) ELECTRONIC MEASUREMENTS LAB
(Common to EIE, E Con E)
B.Tech. III-1Sem. (E.Con.E) T P C

List of Experiments: (Minimum 10 experiments should be conducted)

1. Conversion of D’ Arsonval Galvanometer into DC meters (Current and voltage)
2. Conversion of D’ Arsonval Galvanometer into AC meters (Current and voltage)
4. Measurement of RLC and Q using Q-meter
5. Measurement of strain using strain gauge
7. RTD – characteristics.
8. LVDT – characteristics.
9. Inductive and capacitive tranducers.
11. Bourdon tube
List of Experiments: (Minimum Twelve experiments to be conducted)
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. RPS - 0 – 30 V
2. CRO - 0 – 20 M Hz.
3. Function Generators - 0 – 1 M Hz
4. Components
5. Multi Meters
UNIT-I
INTRODUCTION
Introduction to digital signal processing: discrete time signals and sequences, linear shift invariant systems, stability and causality, linear constant coefficient difference equations. Frequency domain representation of discrete time signals and systems.

UNIT-II
DISCRETE FOURIER SERIES
Properties of discrete Fourier series, DFS representation of periodic sequences, discrete Fourier transforms: properties of DFT, linear convolution of sequences using DFT, computation of DFT. Relation between Z-Transform and DFS.

UNIT-III
FAST FOURIER TRANSFORMS
Fast Fourier transforms (FFT)-Radix2 decimation in time and decimation in frequency FFT algorithms, inverse FFT and FFT for composite N.

UNIT-IV
REALIZATION OF DIGITAL FILTERS
Review of Z-transforms, applications of Z-Transforms, solution of difference equations of digital filters, block diagram representation of linear constant-coefficient difference equations, basic structures of IIR systems, transposed forms, basic structures of FIR systems, system function.
UNIT-V
IIR DIGITAL FILTERS
Analog filter approximations-Butterworth and chebyshev, design of IIR
digital filters from analog filters, design examples: analog-digital
transformations, Illustrative Problems.

UNIT-VI
FIR DIGITAL FILTERS
Characteristics of FIR digital filters, frequency response. Design of FIR
digital filters using window techniques, frequency sampling technique,
comparison of IIR and FIR filters, Illustrative Problems.

UNIT-VII
MULTIRATE DIGITAL SIGNAL PROCESSING
FUNDAMENTALS:
Basic sample rate alteration devices, Multirate Structures for sampling
rate Converters, Multistage design of decimator and Interpolator,
Polyphase Decomposition, Nyquist filters.

UNIT-VIII
APPLICATIONS OF DIGITAL SIGNAL PROCESSING
Spectral analysis of nonstationary Signals, Musical Sound processing,
signal Compression, Transmultiplexers, Discrete Multitone
Transmission of digital data.

TEXT BOOKS:

1. Digital signal processing, principles, Algorithms and applications:
   John G. Proakis, Dimitris G. Manolakis, Pearson Education PHI,
   2007.
2. Digital signal processing, A computer base approach-Sanjit K
   Schaffer, PHI.
REFERENCES:

UNIT I
INTRODUCTION TO PROCESS CONTROL
Definition-Elements of process control-Process variables-degree of freedom- Characteristics of liquid system, gas system and thermal system- Mathematical model of liquid process, gas process, thermal process- Batch process and continuous process- Self regulation.

UNIT II
BASIC CONTROL ACTIONS

UNIT III
MEASURING ELEMENTS

UNIT IV
CONTROLLING ELEMENTS

UNIT V
ADVANCED CONTROL TECHNIQUES
Ratio control systems – Dynamic compensatory-adding feedback-principle areas of feed forward control - Economic considerations. Properties of inner loop, External feedback–Tuning cascade controllers

UNIT VI
ENERGY TRANSFER
Heat transfer-heat exchangers without phase change-Boiling liquids and condensing vapors-combustion control of fuel and air –fired heaters – steam plant control systems –drum level control-drum pressure control-steam temperature control.

UNIT VII
CHEMICAL REACTIONS AND CONVERSIONS
Principles of governing the conduct of reactions-chemical equilibrium-reaction rate- Stability of exothermic reactors – continuous reactors-apporting reactant flows temperature control-maximizing procedure-controlling conversion.

UNIT VIII
MASS TRANSFER OPERATIONS

TEXT BOOKS:
2. Process Control- Peter Harriot for units (T.M.H).

REFERENCES:
UNIT-I
INTRODUCTION
Architecture of 8086 microprocessor, special functions of general purpose registers. 8086 flag register and function of 8086 flags, addressing modes of 8086, instruction set of 8086, assembler directives, simple programs, procedures and macros.

UNIT-II
ASSEMBLY LANGUAGE PROGRAMMING
Assembly language programs involving logical, branch and call instructions, sorting, evaluation of arithmetic expressions, string manipulation.

UNIT-III
ARCHITECTURE OF 8086 & INTERFACING
Pin diagram of 8086-Minimum mode and maximum mode of operation, Timing diagram, memory interfacing to 8086 (static RAM and EPROM). Need for DMA. DMA data transfer method. Interfacing with 8237/8257.

UNIT-IV
PROGRAMMABLE INTERFACING DEVICES

UNIT-V
SERIAL DATA TRANSFER SCHEMES
Asynchronous and synchronous data transfer schemes. 8251 USART architecture and interfacing. TTL to RS232C and RS232C to TTL conversion. Sample program of serial data transfer. Introduction to high-speed serial communications standards, USB.
UNIT-VI
PROGRAMMABLE INTERRUPT CONTROLLERS
PIC 8259, Programming with 8259, Programmable interval timer 8253, Modes of 8253, Programming examples with 8253.

UNIT-VII
8051 MICROCONTROLLER AND ITS PROGRAMMING

UNIT-VIII
ADVANCED MICROCONTROLLERS

TEXT BOOKS:


REFERENCES:

3. Micro computer system 8066/8088 family Architecture, programming and Design-By Liu and GA Gibson, PHI, 2nd Ed.
UNIT I
BASIC STRUCTURE OF COMPUTERS

UNIT II
REGISTER TRANSFER AND MICROOPERATIONS

UNIT III
MICRO PROGRAMMED CONTROL
Control Memory, Address Sequencing, Microprogram Example, Design of Control Unit Hard Wired Control, Microprogrammed Control.

UNIT IV
COMPUTER ARITHMETIC
UNIT V
THE MEMORY SYSTEM
Basic concepts, semiconductor RAM memories, Read-only memories, Cache memories, performance considerations, Virtual memories, secondary storage, Introduction to RAID.

UNIT VI
INPUT-OUTPUT ORGANIZATION
Peripheral Devices, Input-Output Interface, Asynchronous data transfer Modes of Transfer, Priority Interrupt, Direct memory Access, Input – Output Processor (IOP), Serial communication; Introduction to peripheral component, Interconnect (PCI) bus. Introduction to standard serial communication protocols like RS232, USB, IEEE1394.

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

UNIT VIII
MULTI PROCESSORS
Characteristics of Multiprocessors, Interconnection Structures, Interprocessor Arbitration, InterProcessor Communication and Synchronization, Cache Coherence, Shared Memory Multiprocessors.

TEXT BOOKS:


REFERENCES:

UNIT I
INTRODUCTION
Introduction to IC technology-MOS, PMOS, NMOS, CMOS and BI-CMOS technologies- oxidation, lithography, diffusion, Ion implantation, metallisation, Encapsulation, probe testing, integrated resistors and capacitors.

UNIT II
BASIC ELECTRICAL PROPERTIES
Basic electrical properties of MOS and BI-CMOS circuits: $I_{ds}-V_{ds}$ relationships, MOS transistor threshold voltage, $g_m$, $g_{ds}$, figure of merit; pass transistor, NMOS inverter, various pull-ups, CMOS inverter analysis and design; BI-CMOS inverters.

UNIT III
VLSI CIRCUIT DESIGN PROCESSES
VLSI design flow, MOS layers, stick diagrams, design rules and layout, 2 m CMOS design rules for wires, contacts and transistors layout diagrams for NMOS and CMOS inverters and gates, scaling of MOS circuits, limitations of scaling.

UNIT IV
GATE LEVEL DESIGN
Logic gates and other complex gates, switch logic, alternate gate circuits, basic circuit concepts, sheet resistance $R_S$ and its concept to MOS, area capacitance units, calculations-(Micro)-delays, driving large capacitive loads, wiring capacitances, fan-in and fan-out, choice of layers.
UNIT V
SUB SYSTEM DESIGN
Sub system design, shifters, adders, ALUs, multipliers, parity generators, comparators, zero/one detectors, counters, high density memory elements.

UNIT VI
SEMICONDUCTOR INTEGRATED CIRCUIT DESIGN
PLAs, FPGAs, CPLDs, standard cells, programmable array logic, design approach.

UNIT VII
VHDL SYNTHESIS
VHDL synthesis, circuit design flow, circuit synthesis, simulation, layout, design capture tools, design verification tools, test principles.

UNIT VIII
CMOS TESTING
CMOS testing need for testing, test principles, design strategies for test, chip level test techniques, system-level test techniques, layout design for improved testability.

TEXT BOOKS:


REFERENCES:

Objective:
This subject deals with state space, describing function, phase plane and stability analysis including controllability and observability. It also deals with modern control and optimal control systems.

UNIT I
STATE SPACE ANALYSIS
State Space Representation, Solution of State Equation, State Transition Matrix, Canonical Forms – Controllable Canonical Form, Observable Canonical Form, Jordan Canonical Form.

UNIT II
CONTROLLABILITY AND OBSERVABILITY
Tests for controllability and observability for continuous time systems – Time varying case, minimum energy control, time invariant case, Principle of Duality, Controllability and observability form Jordan canonical form and other canonical forms.

UNIT III
DESCRIBING FUNCTION ANALYSIS
Introduction to nonlinear systems, Types of nonlinearities, describing functions, describing function analysis of nonlinear control systems.

UNIT IV
PHASE-PLANE ANALYSIS
Introduction to phase-plane analysis, Method of Isoclines for Constructing Trajectories, singular points, phase-plane analysis of nonlinear control systems.
UNIT V
STABILITY ANALYSIS
Stability in the sense of Lyapunov, Lyapunov’s stability and Lypanov’s instability theorems. Direct method of Lypanov for the Linear and Nonlinear continuous time autonomous systems.

UNIT VI
MODAL CONTROL
Effect of state feedback on controllability and observability, Design of State Feedback Control through Pole placement. Full order observer and reduced order observer.

UNIT VII
CALCULUS OF VARIATIONS

UNIT VIII
OPTIMAL CONTROL

TEXT BOOKS:

REFERENCES:
Minimum Twelve Experiments to be conducted:

Part A (IC Application Lab):
1. OP AMP Applications – Adder, Subtractor, Comparator Circuits.
2. Active Filter Applications – LPF, HPF (first order)
3. Function Generator using OP AMPS.
4. IC 555 Timer – Monostable and Astable Operation Circuit.
5. IC 566 – VCO Applications.
6. Voltage Regulator using IC 723.
7. 4 bit DAC using OP AMP.

Part B (ECAD Lab):
Simulate the internal structure of the following Digital IC’s using VHDL / VERILOG and verify the operations of the Digital IC’s (Hardware) in the Laboratory
1. Logic Gates- 74XX.
3. 3-8 Decoder -74138 & 8-3 Encoder- 74X148.
4. 8 x 1 Multiplexer -74X151 and 2x4 Demultiplexer-74X155.
5. 4 bit Comparator-74X85.
6. D Flip-Flop 74X74.
7. JK Flip-Flop 74X109.
8. Decade counter-74X90.

Equipment required for Laboratories:
1. RPS
2. CRO
3. Function Generator
4. Multi Meters
5. IC Trainer Kits (Optional)
6. Bread Boards
7. Components: - IC741, IC555, IC566, 7805, 7809, 7912 and other essential components.
8. Analog IC Tester

**For Software Simulation**
1. Computer Systems
2. LAN Connections (Optional)
3. Operating Systems
4. VHDL/VERILOG
5. FPGAS/CPLDS (Download Tools)
1. Introduction

The Advanced English Language Skills Lab introduced at the 3rd year B.Tech level is considered essential for the student for focusing on his/her career. At this stage it is imperative for the student to start preparing for the ever growing competition in the job market. In this scenario, in order to be on par with the best, he/she needs to improve his/her Communication and soft skills.

This course focuses on the practical aspects of English incorporating all the four (LRSW) skills relevant to the requirements of the prospective employers in view of globalization. The proposed course will enable the students to perform the following:

- Intensive reading to improve comprehension and communication
- Attentive listening for better understanding
- Write project/research/technical reports
- Write Resume’ to attract attention
- Discuss ideas / opinions for better solutions
- Face interviews confidently
- Gather information, organize ideas, and present them effectively before an audience
- To help the students cultivate the habit of reading passages from the computer monitor, thus providing them with the required ability to face computer-based competitive exams such GRE, TOEFL,CAT, GMAT etc.

2. Objectives:

Keeping in mind the previous exposure of the student to English, this lab focuses on improving the student’s proficiency in
English at all levels. The lab intends to train students to use language effectively, to participate in group discussions, to help them face interviews, and sharpen public speaking skills and enhance the confidence of the student by exposing him/her to various situations and contexts which he/she would face in his/her career.

3 Syllabus
The following course content is prescribed for the Advanced Communication Skills Lab:

Reading Comprehension -- Reading for facts, guessing meanings from context, speed reading, scanning, skimming for building vocabulary(synonyms and antonyms, one word substitutes, prefixes and suffixes, idioms and phrases.)

Listening Comprehension-- Listening for understanding, so as to respond relevantly and appropriately to people of different backgrounds and dialects in various personal and professional situations.


Resume’ Writing—Structure, format and style, planning, defining the career objective, projecting one’s strengths, and skills, creative self marketing, cover letter.

Group Discussion-- Communicating views and opinions, discussing, intervening, providing solutions on any given topic across a cross-section of individuals,(keeping an eye on modulation of voice, clarity, body language, relevance, fluency and coherence) in personal and professional lives.

Interview Skills—Concept and process, pre-interview planning, mannerisms, body language, organizing, answering strategies, interview through tele and video-conferencing.
Technical Presentations (Oral)— Collection of data, planning, preparation, type, style and format, use of props, attracting audience, voice modulation, clarity, body language, asking queries.

4. Minimum Requirements
The English Language Lab shall have two parts:

The Computer aided Language Lab for 60 students with 60 systems, one master console, LAN facility and English language software for self-study by learners.
The Communication Skills Lab with movable chairs and audio-visual aids with a P.A System, a TV, A digital stereo-audio and video system, Camcorder etc.

System Requirement (Hardware Component):
Computer network with LAN with a minimum of 60 multimedia systems with the following specifications:
P-IV Processor, Speed-2.8 GHz, RAM_512 MB minimum, Hard Disk-80 GB, Headphones

Prescribed Software: GLOBARENA

Books Suggested for English Language Lab Library (to be located within the lab in addition to the CDs of the text book which are loaded on the systems):

UNIT I
INTRODUCTION TO MANAGEMENT:

UNIT II
DESIGNING ORGANIZATIONAL STRUCTURES:
Basic concepts related to Organisation - Departmentation and Decentralisation, Types of mechanistic and organic structures of organisation (Line organization, Line and staff organization, functional organization, Committee organization, matrix organization, Virtual Organisation, Cellular Organisation, team structure, boundaryless organization, inverted pyramid structure, lean and flat organization structure) and their merits, demerits and suitability.

UNIT III
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: chart, R chart, c chart, p chart, (simple Problems), Acceptance Sampling, Deming’s contribution to quality.
UNIT IV
MATERIALS MANAGEMENT:
Objectives, Need for Inventory control, EOQ, ABC Analysis, Purchase Procedure, Stores Management and Stores Records.
Marketing: Functions of Marketing, Marketing Mix, Marketing Strategies based on Product Life Cycle, Channels of distribution.

UNIT V
HUMAN RESOURCES MANAGEMENT (HRM):

UNIT VI
PROJECT MANAGEMENT (PERT/CPM):
Network Analysis, Programme Evaluation and Review Technique (PERT), Critical Path Method (CPM), Identifying critical path, Probability of Completing the project within given time, Project Cost Analysis, Project Crashing. (simple problems).

UNIT VII
STRATEGIC MANAGEMENT:

UNIT VIII
CONTEMPORARY MANAGEMENT PRACTICES:
TEXT BOOKS:


REFERENCES:

2. Koontz & Weihrich: Essentials of Management, 6/e, TMH, 2005
UNIT I
BASIC CONCEPTS

UNIT II
POWER SOURCES AND SENSORS

UNIT III
MANUPULATORS
Construction of Manipulators, Manipulator Dynamic and Force Control, Electronic and Pneumatic manipulators.

UNIT IV
ACTUATORS AND GRIPPERS
Pneumatic, Hydraulic Actuators, Stepper Motor Control Circuits, End Effector, Various types of Grippers, Design consideration.

UNIT V
UNIT VI
KINEMATICS
Forward and Inverse Kinematic Problems, Solutions of Inverse Kinematic problems, Multiple Solution, Jacobian Work Envelop – Hill Climbing Techniques.

UNIT VII
PATH PLANNING
Trajectory planning and avoidance of obstacles, path planning, Skew motion, joint integrated motion – straight line motion – Robot programming, languages and software packages.

UNIT VIII
CASE STUDY

TEXT BOOKS:
1. Industrial Robotics / Groover M P /Pearson Edu.

REFERENCES:
2. Robotics and Control / Mittal R K & Nagrath I J / TMH.
5. Robot Analysis and Intelligence / Asada and Slow time / Wiley Inter-Science.
UNIT I
INTRODUCTION

UNIT II
HARDWARE SOFTWARE Co-DESIGN and PROGRAMME MODELLING

UNIT III
EMBEDDED HARDWARE DESIGN AND DEVELOPMENT

UNIT IV
REAL-TIME OPERATING SYSTEMS (RTOS) BASED EMBEDDED SYSTEM DESIGN
Operating System Basics, Types of Operating Systems, Tasks, Process and Threads, Multiprocessing and Multitasking, Task Scheduling, Threads, Processes and Scheduling : Putting them Altogether, Task Communication, Task Synchronization, Device Drivers, How to Choose an RTOS.
UNIT V
DEVICES AND COMMUNICATION BUSES FOR DEVICES NETWORK

UNIT VI
PROGRAM MODELING CONCEPTS

UNIT VII
REAL TIME OPERATING SYSTEMS

UNIT VIII
DESIGN EXAMPLES AND CASE STUDIES OF PROGRAM MODELING AND PROGRAMMING WITH RTOS-2
Case study of Communication between Orchestra Robots, Embedded Systems in Automobile, Case study of an Embedded System for an Adaptive Cruise Control(ACC) System in a Car, Case study of an Embedded System for a Smart Card, Case study of a Mobile Phone Software for Key Inputs.
TEXT BOOKS:


REFERENCES:

UNIT – I
BASICS OF PROBABILITY THEORY AND DISTRIBUTIONS
Basic Probability theory – Binomial, Poisson, Exponential and Weibull distributions.

UNIT – II
NETWORK MODELING AND RELIABILITY ANALYSIS
Analysis of series, Parallel, Series – Parallel networks, fully redundant and Partially redundant systems (K – out – of m) systems – use and types of redundancy and system reliability improvement methods.

UNIT – III
RELIABILITY FUNCTIONS
Reliability functions f(t), F(t), h(t), R(t) and their relationships, Expected value and Standard Deviation of exponential distribution – Bath Tub Curve – Reliability measures MTTF, MTTR, MTBF.

UNIT – IV
MARKOV MODELING

UNIT – V
MAINTAINABILITY - BASIC CONCEPTS
Definition, Basic concepts, Relationship between Reliability, Maintainability, Availability – corrective maintenance time distributions – Maintainability distributions.
UNIT – VI
MAINTAINABILITY MEASURES
Objectives, types of maintenance – Preventive, condition – based and reliability centered maintenance – Terotechnology, total productive maintenance (TPM).

UNIT – VII
MAINTAINABILITY – DESIGN ASPECTS
Design considerations for maintainability – Introduction to Life testing, Estimation of parameters for exponential and Weibull distributions.

UNIT – VIII
SAFETY
Causes of failure and reliability, Human reliability and operator training, Origins of Consumerism and importance of product knowledge, product safety, product reliability and product safety improvement program.

TEXT BOOKS:
1. Reliability Engineering, E. Balagurusamy.

REFERENCES:
1. Maintainability, B.S.Blanchard.
UNIT – I
AN OVERVIEW OF POWER GENERATION

UNIT – II
PARAMETERS AND MEASUREMENTS - I
Electrical measurements – current, Voltage, Power, Frequency power factor, Trivector meter.

UNIT – III
PARAMETERS AND MEASUREMENTS - II

UNIT – IV
COMBUSTION CONTROL IN BOILERS
Combustion control – control of Main header Pressure, air fuel ratio control – furnace draft and excessive air control, drum level (three element control) main and reheat steam temperature control, burner tilting up, bypass damper, super heater.

UNIT – V
OTHER CONTROLS
Spray and gas recirculation controls – BFP recirculation control – Hot well and deaerator level control – pulverizer control, Computers in Power Plants.
UNIT – VI
TURBINE MONITORING AND CONTROL
Condenser vacuum control – gland steam exhaust pressure control –
Speed, vibration, Shell temperature monitoring and control –
Lubricating oil temperature control – Hydrogen – generator cooling
system.

UNIT – VII
ANALYZERS IN POWER PLANTS - I
Thermal conductive type – paramagnetic type, Oxygen analyzer,
infrared type and trim analyzer – Spectrum analyzer – hydrogen purity
meter.

UNIT – VIII
ANALYZERS IN POWER PLANTS – II
Chromatography – pH meter – Conductivity cell – fuel analyzer, brief
survey of pollution monitoring and control equipment.

TEXT BOOKS:

1. Modern Power Stations Practice, vol. 6, Instrumentation, Controls

REFERENCES:

UNIT – I

UNIT – II

UNIT – III

UNIT – IV
Valve controlled Systems: Flow through a single speed control valve, Series Pressure Compensation, combined directional and flow rate control valve, Steady reaction and Transient Reaction force.

UNIT – V
UNIT – VI

UNIT – VII

UNIT – VIII

TEXT BOOKS:

REFERENCES:
1. Mechatronics, by Prof. C.V. Venkataramana, SBS Publishers and Distributors.
UNIT-I
INTRODUCTION TO MANUFACTURING OPERATIONS AND SYSTEMS
Manufacturing industries and products, manufacturing operations, product/production relationships, production concepts, and mathematical models, costs of manufacturing operations, Components of a manufacturing systems, classifications of manufacturing systems, overview of the classification scheme, manufacturing progress functions (learning curves).

UNIT-II
INTRODUCTION TO AUTOMATION & INDUSTRIAL CONTROL SYSTEMS
Basic elements of aim automated system, advanced automation functions, levels of automation, process industries, verse discrete manufacturing industries, continuous verses discrete control, computer process control, forms of computer process control.

UNIT-III
Numerical Control and Discrete Control Using PLC’s, fundamental of NC technology, computer numerical, DNC, applications of numerical control, discrete process control, ladder logic diagrams, programmable logic controllers, personal computers using soft logic.

UNIT-IV
INDUSTRIAL ROBOTICS
Robot anatomic and related attributes, robot control systems, end effectors, sensors in robotics, industrial robot applications, robot programming, Engineering analysis of industrial robots.
UNIT-V
FLEXIBLE MANUFACTURING SYSTEMS
What is an FMS?, FMS Components, FMS applications, and benefits, FMS planning and implementation issues, fundamentals of automated assembly systems, design for automated assembly, quantitative analysis of assembly systems.

UNIT-VI
QUALITY ASSURANCE AND STATISTICAL PROCESS CONTROL
Quality defined, traditional and modern quality control, taguchi methods in quality engineering, ISO 9000, process variability, and process capability, and control charts, other SPC tools, implementing statistical process control.

UNIT-VII
QUALITY INSPECTION TECHNOLOGIES
Inspection metrology, contact verses non contact inspection techniques, conventional measuring and gauging techniques and coordinate measuring machines, surface measurement, machine vision, other optical inspection techniques, non-contact non-optical inspection technologies.

UNIT-VIII
PROCESS AND PRODUCTION PLANNING
Process planning, computer-aided process planning (CAP), concurrent engineering and design for manufacturing, aggregate production planning and the master production scheduled, material requirements planning (MRP), capacity planning, shop floor control, inventory control.

TEXT BOOKS:

REFERENCES:

UNIT – I
INTRODUCTION

UNIT – II
PERFORMANCE MEASURE
Performance measures for optimal control problem – Minimum time problems, Technical Control problems, minimum-control-effort problems, tracking problems, Select in a performance measure, the carrier landing of a JET AIRCRAFT.

UNIT – III
DYNAMIC PROGRAMMING-I

UNIT – IV
DYNAMIC PROGRAMMING-II
Computational procedure for solving control problems, Characteristics of dynamic programming solution, Continuous and discrete linear regulator problems, Hamilton – Jacobi – Bellman equation.

UNIT – V
CALCULUS OF VARIATIONS
UNIT – VI
VARIATIONAL APPROACH TO OPTIMAL CONTROL PROBLEMS

UNIT – VII
NUMERICAL DETERMINATION OF OPTIMAL TRAJECTORIES
Two point boundary – Value problems. Methods of steepest decent, variation of extremals, Quasilinearization, Gradient projection algorithm.

UNIT – VIII
STOCHASTIC OPTIMAL LINEAR ESTIMATION
Introduction, Stochastic processes and linear systems, Optimal estimation for linear continues - time system and linear discrete – time systems, Stochastic optimal linear regulators.

TEXT BOOK:


REFERENCES:

UNIT I
OPERATING SYSTEMS OVERVIEW:
Operating systems functions, Overview of computer operating systems, protection and security, distributed systems, special purpose systems, operating systems structures: operating system services and systems calls, system programs, operating system structure, operating systems generation.

UNIT II
PROCESS MANAGEMENT:
Process concepts, threads, scheduling-criteria, algorithms, their evaluation, Thread scheduling, case studies UNIX, Linux, Windows.

UNIT III
CONCURRENCY:
Process synchronization, the critical-section problem, Peterson’s Solution, synchronization Hardware, semaphores, classic problems of synchronization, monitors, Synchronization examples, atomic transactions. Case studies UNIX, Linux, Windows.

UNIT IV
MEMORY MANAGEMENT:
Swapping, contiguous memory allocation, paging, structure of the page table, segmentation, virtual memory, demand paging, page-replacement, algorithms, Allocation of frames, Thrashing case studies UNIX, Linux, Windows.

UNIT V
PRINCIPLES OF DEADLOCK:
System model, deadlock characterization, deadlock prevention, detection and avoidance, recovery form deadlock.
UNIT VI
FILE SYSTEM INTERFACE:

UNIT VII
MASS-STORAGE STRUCTURE:
Overview of Mass-storage structure, Disk structure, disk attachment, disk scheduling, swap-space management, RAID structure, stable-storage implementation, Tertiary storage structure. I/O systems: Hardware, application I/O interface, kernel I/O subsystem, Transforming I/O requests to Hardware operations, STREAMS, performance.

UNIT VIII
PROTECTION:

TEXT BOOKS:


REFERENCES:

6. An Introduction to Operating Systems, P.C.P. Bhatt, PHI.
UNIT-I
Information systems in the enterprise: Why information systems, perspectives on information systems, contemporary approaches to information systems, four major types of systems in organizations—transaction processing systems, management information systems, decision support systems, executive support systems.

UNIT-II

UNIT-III

UNIT-IV
The wireless revolution: business value of wireless networking, wireless transmission media and devices, cellular network standards and generations, wireless computer networks and internet access, M-commerce and Mobile computing, wireless technology in the enterprise.

UNIT-V
Security and control: system vulnerability and abuse, business value of security and control, establishing a management framework for security and control, technologies and tools for security and control.
UNIT-VI

UNIT-VII
Redesigning the organizations with information systems: systems as planned organizational change, business process reengineering and process improvement, overview of system development, alternative systems building approaches – traditional systems life cycle, prototyping, end-user development, application software package and outsourcing.

UNIT-VIII
Managing change and international information systems: The importance of change management in information systems success and failure, managing implementation, the growth of international systems, organizing international information systems, managing global systems, technology issues and opportunities for global value chains.

TEXT BOOKS:

REFERENCES:
Any Ten of the following experiments are to be conducted:

1. Characteristics of synchro transmitter, synchro receiver and control transformers.
2. Torque-displacement characteristics of the stepper motor using A/D converters.
3. Control characteristics of magnetic amplifier with and without feedback.
4. Open loop control of a relay servomechanism (ON-OFF control of a temperature in a heater bath).
5. Determination of the control characteristics of AC servomotor.
6. Transfer function of armature controlled DC servomotor with inertia and viscous damping.
7. DC motor speed control with regenerative and degenerative feedback and with tachogenerator in the feedback path.
8. DC position control system-output control with variation of control loop gain.
9. Design of phase lead and phase lag compensators
10. Step function response of the second order system on MATLAB – control of transient and steady state performances.
11. Plotting root locus for selected transfer functions using MATLAB.
12. Determination of gain and phase margin for the transfer function in frequency domain using MATLAB.
13. Obtaining state space model of a classical transfer function using MATLAB.
Any Ten of the Experiments in Power Electronics Lab

1. Study of Characteristics of SCR, MOSFET & IGBT.
2. Gate firing circuits for SCR’s.
5. Forced Commutation circuits (Class A, Class B, Class C, Class D & Class E).
6. DC Jones chopper with R and RL Loads.
7. Single Phase Parallel, inverter with R and RL loads.
12. PSPICE simulation of single-phase full converter using RLE loads.
13. PSPICE simulation of single-phase AC voltage controller using RLE loads.
14. PSPICE simulation of resonant pulse commutation circuit and Buck chopper.
15. PSPICE simulation of single phase Inverter with PWM control.
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
FUNDAMENTAL MODELS OF ARTIFICIAL NEURAL NETWORKS:

UNIT III
FEED FORWARD NETWORKS:
UNIT IV
ADALINE AND MADALINE NETWORKS:

UNIT V
COUNTER PROPAGATION NETWORKS:

UNIT VI
ASSOCIATIVE MEMORY NETWORKS - I:
Types, Architecture, Continuous and Discrete Hopfield Networks, Energy Analysis, Storage and Retrival Algorithms, Problems with Hopfield Networks.

UNIT VII
ASSOCIATIVE MEMORY NETWORKS – II:

UNIT VIII
APPLICATIONS OF NEURAL NETWORKS:

TEXT BOOKS:

2. Introduction to Neural Networks Using MATLAB 6.0 - S.N. Shivanandam, S. Sumati, S. N. Deepa, TMH.
REFERENCES:

3. Fundamental of Neural Networks – Laurene Fausett, Pearson, 1st Ed.
4. Artificial Neural Networks - B. Yegnanarayana, PHI.
UNIT I
INTRODUCTION
Concept of Adaptive Control, Definitions, Types of adaptivity, Effects of process variation, Control Essentials, Ratio of Adaptive Control, and Adaptive Systems.

UNIT II
REAL TIME PARAMETER ESTIMATION

UNIT III
DETERMINISTIC SELF TUNING REGULATORS
Introduction, Block Diagram, Pole Placement Design, Indirect Self Tuning Regulators (STR), Continuous – Time Self Tuners, Direct Self Tuning Regulators.

UNIT IV
STOCHASTIC SELF TUNING REGULATORS
Design of Minimum Variance and Moving Average Controllers – Minimum Variance Control, Nonminimum phase System, Moving Average Controller, LQG control, Stochastic Self Tuning Regulators, Unification of Direct Self Tuning Regulators, Linear Quadratic STR.

UNIT V
STABILITY ANALYSIS
UNIT VI
MODEL REFERENCE ADAPTIVE SYSTEMS (MRAS)
Introduction – The MIT rules, Determination of Adaptation Gain, Design of MRAS using Lyapunov Theory, Output Feedback, Relations between MRAS and STR.

UNIT VII
AUTO-TUNING
Introduction, PID Control, Auto-Tuning Techniques, Transient Response Methods, Methods based on Relay feedback, Relay oscillations.

UNIT VIII
GAIN SCHEDULING

TEXT BOOKS:

REFERENCES:
2. Digital control systems by P.N. Paraskevopoulos Prentice Hall.
JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
ANANTAPUR

(9A13802) TELEMETRY & TELE CONTROL
(Common to EIE, E Con E)
(ELECTIVE - III)

B.Tech. IV-II Sem. (E.Con.E) T P C
4 0 4

UNIT – I
TELEMETRY PRINCIPLES
Introduction, Functional blocks of Telemetry system, Methods of Telemetry – Non Electrical, Electrical, Pneumatic, Frequency, Power Line Carrier Communication.

UNIT – II
SYMBOLS AND CODES
Bits and Symbols, Time function pulses, Line and Channel Coding, Modulation Codes. Intersymbol Interference.

UNIT – III
FREQUENCY DIVISION MULTIPLXED SYSTEMS
FDM, IRIG Standard, FM and PM Circuits, Receiving end, PLL.

UNIT – IV
TIME DIVISION MULTIPLXED SYSTEMS

UNIT – V
SATELLITE TELEMETRY

UNIT – VI
OPTICAL TELEMETRY
Optical fibers Cable – Sources and detectors – Transmitter and Receiving Circuits, Coherent Optical Fiber Communication System.
UNIT – VII & VIII
TELECONTROL METHODS

TEXT BOOKS:

1. Telemetry Principles – D. Patranabis, TMH.

REFERENCES:

UNIT I
Components of Medical Instrumentation System, Bio–amplifier, Static and dynamic characteristics of medical instruments, Biosignals and characteristics, Problems encountered with measurements from human beings.

UNIT II

UNIT III

UNIT IV
Mechanical function, Electrical Conduction system of the heart, Cardiac cycle, Relation between electrical and mechanical activities of the heart.

UNIT V
Cardiac Instrumentation Blood pressure and Blood flow measurement, Specification of ECG machine, Einthoven triangle, Standard 12-lead configurations, Interpretation of ECG waveform with respect to electro mechanical activity of the heart, Therapeutic equipment, Pacemaker, Defibrillator, Shortwave diathermy, Hemodialysis machine.

UNIT VI
Neuro-Muscular Instrumentation Specification of EEG and EMG machines, Electrode placement for EEG and EMG recording, Interpretation of EEG and EMG.
UNIT VII
Respiratory Instrumentation Mechanism of respiration, Spirometry, Pnemuotachograph Ventilators.

UNIT VIII
Patient electrical safety, types of hazards, natural protective mechanism, leakage current, patient isolation, hazards in operation rooms, grounding conditions in hospital environment.

TEXT BOOKS:


REFERENCES:

UNIT I
VIRTUAL INSTRUMENTATION:
Historical perspective, advantages, block diagram and architecture of a virtual instrument, data-flow techniques, graphical programming in data flow, comparison with conventional programming. Development of Virtual Instrument using GUI, Real-time systems, Embedded Controller, OPC, HMI / SCADA software, Active X programming.

UNIT II
VI PROGRAMMING TECHNIQUES:
VIS and sub-VIS, loops and charts, arrays, clusters and graphs, case and sequence structures, formula nodes, local and global variables, string and file I/O, Instrument Drivers, Publishing measurement data in the web.

UNIT III
DATA ACQUISITION BASICS:
Introduction to data acquisition on PC, Sampling fundamentals, Input/Output techniques and buses. ADC, DAC, Digital I/O, counters and timers, DMA. Software and hardware installation, Calibration, Resolution, Data acquisition interface requirements.

UNIT IV
VI CHASSIS REQUIREMENTS:
Common Instrument Interfaces: Current loop, RS 232C/ RS485, GPIB.

UNIT V
BUS INTERFACES:
USB, PCMCIA, VXI, SCSI, PCI, PXI, Firewire, PXI system controllers, Ethernet control of PXI.
UNIT VI
NETWORKING BASICS FOR OFFICE & INDUSTRIAL APPLICATIONS:
VISA and IVI.

UNIT VII
VI TOOLSETS, DISTRIBUTED I/O MODULES:
Application of Virtual Instrumentation: Instrument Control,
Development of process database management system.

UNIT VIII
SIMULATION OF SYSTEMS USING VI:
Development of Control system, Industrial Communication, Image
acquisition and processing, Motion control.

TEXT BOOKS:
1. Gary Johnson, LabVIEW Graphical Programming, 2nd edition,

REFERENCES:

Course Aim: This course aims to introduce the latest instrumentation system design and development tools available today.

Prerequisite: Course on personal computer systems and interfacing.
UNIT I

UNIT II
The Data Link Layer: Data link Layer Design Issues, Elementry Data Link Protocols, Sliding Window Protocols.

UNIT III

UNIT IV

UNIT V
Internetworking, The Network Layer in the Internet.

UNIT VI

UNTI VII

UNTI VIII

TEXT BOOKS:

1. Computer Networks, Andrew S. Tanenbaum, 4e, Pearson Education.

REFERENCES:

5. Computer and Communication Networks ,Nader F. Mir, Pearson Education
UNIT I

UNIT II

UNIT III
The Relational Database Model: A Logical View of Data-Keys, Integrity Rules, Relational Set Operators, The Data Dictionary and the System Catalog-Relationships within the Relational Database, Data Redundancy Revisited, Indexes, Codd’s Relational Database Rules.

UNIT IV
UNIT V

UNIT VI
Transaction Management and Concurrency Control: What is a Transaction?, Transaction State, Implementation of atomicity and durability, Concurrency Control, Serializability, Testing for Serializability, Concurrency Control with Locking Methods, Concurrency Control with TimeStamping Methods, Concurrency Control with Optimistic Methods, Database Recovery Management-Validation Based Protocols-Multiple Granularity.

UNIT VII

UNIT VIII
File Structure and Indexing: Overview of Physical Storage Media, Magnetic Disks, RAID-Tertiary Storage, Storage Access, File Organization, Organization of Records in Files, Data-Dictionary Storage, Basic Concepts of Indexing, Ordered Indices, B+ Tree Index Files, B-Tree Index Files, Multiple Key Access, Static Hashing, Dynamic Hashing, Comparison of Ordered Indexing and Hashing, Bitmap Indices, Indexed Sequential Access Methods (ISAM).

TEXT BOOKS:
REFERENCES:

3. Introduction to Database Systems, C. J. Date Pearson Education.
4. Oracle for Professionals, The X Team, S. Shah and V. Shah, SPD.
5. Database Systems Using Oracle: A Simplified guide to SQL and PL/SQL, Shah, PHI.
UNIT I
INTRODUCTION TO DATA COMMUNICATIONS AND NETWORKING:
Standards Organizations for Data Communications, Layered Network Architecture, Open Systems Interconnection, Data Communications Circuits, Serial and parallel Data Transmission, Data communications Circuit Arrangements.

SIGNALS, NOISE, MODULATION, AND DEMODULATION:

UNIT II
METALLIC CABLE TRANSMISSION MEDIA:

OPTICAL FIBER TRANSMISSION MEDIA:
UNIT III
DIGITAL TRANSMISSION:
Pulse Modulation, Pulse code Modulation, Dynamic Range, Signal Voltage –to-Quantization Noise Voltage Ration, Linear Versus Nonlinear PCM Codes, Companding, PCM Line Speed, Delta Modulation PCM and Differential PCM.

MULTIPLEXING AND T CARRIERS:

UNIT IV
WIRELESS COMMUNICATIONS SYSTEMS:

UNIT V
TELEPHONE INSTRUMENTS AND SIGNALS:
The Subscriber Loop, Standard Telephone Set, Basic Telephone Call Procedures, Call Progress Tones and Signals, Cordless Telephones, Caller ID, Electronic Telephones, Paging systems.

THE TELEPHONE CIRCUIT:

UNIT VI
CELLULAR TELEPHONE SYSTEMS:
Concepts – Frequency reuse- Cell splitting – Network components – Call Processing - First- Generation Analog Cellular Telephone, Personal Communications system, Second-Generation Cellular
Telephone Systems, N-AMPS, Digital Cellular Telephone, Global system for Mobile Communications.

UNIT VII
DATA COMMUNICATIONS CODES, ERROR CONTROL, AND DATA FORMATS:
Data Communications Character Codes, Bar Codes, Error Control, Error Detection, Error Correction, Character Synchronization.
DATA COMMUNICATIONS EQUIPMENT:

UNIT VIII
DATA –LINK PROTOCOLS:

TEXT BOOKS:

1. Introduction to Data Communications and Networking, Wayne Tomasi, Pearson Education.

REFERENCES