ACADEMIC REGULATIONS

COURSE STRUCTURE AND

DETAILED SYLLABUS

INFORMATION TECHNOLOGY

B.TECH. FOUR YEAR DEGREE COURSE

(Applicable for the batches admitted from 2012-2013)

VNR VIGNANA JYOTHI INSTITUTE OF

ENGINEERING AND TECHNOLOGY

An Autonomous Institute
Approved by AICTE & Affiliated to JNTUH
Accredited by NBA and NAAC with ‘A’ Grade

Bachupally, Nizampet (S.O), Hyderabad – 500090, Andhra Pradesh, India
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1. Courses of study
The following courses of study are offered at present for specialization for the B. Tech. Course:

<table>
<thead>
<tr>
<th>Branch Code</th>
<th>Branch</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>Civil Engineering</td>
</tr>
<tr>
<td>02</td>
<td>Electrical and Electronics Engineering</td>
</tr>
<tr>
<td>03</td>
<td>Mechanical Engineering</td>
</tr>
<tr>
<td>04</td>
<td>Electronics and Communication Engineering</td>
</tr>
<tr>
<td>05</td>
<td>Computer Science and Engineering</td>
</tr>
<tr>
<td>10</td>
<td>Electronics and Instrumentation Engineering</td>
</tr>
<tr>
<td>12</td>
<td>Information Technology</td>
</tr>
<tr>
<td>24</td>
<td>Automobile Engineering</td>
</tr>
</tbody>
</table>

1.1 Eligibility Criteria for Admission
The eligibility criteria for admission into engineering programmes shall be as mentioned below:
- The candidate shall be an Indian National / NRI
- The candidate should have completed 16 years of age as on 31st December of the academic year for which the admissions are being conducted.
- The Candidate should have passed the qualifying examination (10+2) or equivalent as on the date of admission.
- Seats in each programme in the Institution are classified into Category A and Category B as per the G.Os.
1.1.1 **Category – A Seats**
These seats will be filled through counseling as per the rank at the Common Entrance Test (EAMCET) conducted by the State Government and as per other admission criteria laid down in the G.Os.

1.1.2 **Category - B Seats**
These seats will be filled by the institute as per the G.Os Issued by State Government from time to time.

1.1.3 **Category: Lateral Entry**
The candidate shall be admitted into the Third Semester, based on the rank secured by the candidate at Engineering Common Entrance Test (ECET(FDH)) by the Convener, ECET.

2. **Distribution and Weightage of Marks**
i. The performance of a student in each Semester shall be evaluated subject-wise with a maximum of 100 marks for theory and 100 marks for practical subjects. In addition, an Industry oriented mini-project, Seminar, Comprehensive viva-voce, and Project Work shall be evaluated for 50, 50, 50 and 200 marks respectively.

   ii. For theory subjects the distribution shall be 30 marks for Mid Semester Evaluation and 70 marks for the End-Examination. For theory subjects, Two mid examinations will be conducted in each Semester as per the academic calendar. Each mid examination is evaluated for 25 marks. Two assignments are to be given to students covering the syllabus of first Mid and second Mid examinations and are evaluated for 5 marks each. The first assignment shall be submitted before first mid examinations and second Assignment should be submitted before second mid examination.

   At the end of the Semester, Internal Marks (Maximum 30) for the respective subject is assigned as follows:

   (a) 25 marks: 80% from the best performed Mid examination and 20% from the other Mid examination.

   (b) 5 marks: Average of the two assignment marks

   iii. For practical subjects there shall be a continuous evaluation during the Semester for 30 marks and 70 marks for end examination. Out of the 30 marks, day-to-day work in the laboratory shall be evaluated for 10 marks, and 10 marks for practical examination (two practical examinations will be conducted and the average of the two examinations will be taken into account) and 10 marks for laboratory record.

**NOTE:** A student who is absent for any assignment/Mid term examination for any reason whatsoever shall be deemed to have secured ‘zero’ marks in the test/examination and no makeup test/examination shall be conducted.
iv. For the subjects having design and / or drawing, (such as Engineering Graphics, 
Engineering Drawing, Machine Drawing, Production Drawing Practice, and 
Estimation etc.,) the distribution shall be 30 marks for internal evaluation (15 
marks for day-to-day work and 15 marks for Mid examination (the average of 
the two examinations will be taken into account) and 70 marks for end 
semester examination. There shall be two Mid examinations in a Semester.

V. There shall be an industry-oriented mini-Project, in collaboration with an 
industry of their specialization, to be taken up during the a summer vacation after 
III year II Semester examination. The mini project shall be evaluated during 
the IV year I Semester. The industry oriented mini project shall be submitted in 
report form and should be presented before a committee, which shall be 
evaluated for 50 marks. The committee consists of Head of the Department, the 
supervisor of mini project and a senior faculty member of the department. There 
shall be no Midterm assessment for industry oriented mini project.

However, attending the shadow engineering program is a pre – requisite 
for evaluating industry – oriented mini project. Students should submit a 
report on learning outcomes of the shadow engineering. Every student should 
attend shadow engineering programming an industry for a week days during 
second year I or II semester.

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 other 
than the project topic and prepare a technical report, showing his understanding 
of the topic, and submit to the department, which shall be evaluated by a 
Departmental committee consisting of the Head of the department, Seminar 
supervisor and a senior faculty member. The seminar will be awarded 50 
marks in which 40 marks will be evaluated for seminar report and 10 marks 
for MTP Record by the committee.

vii. There shall be a Comprehensive Viva-Voce in IV year II Semester. The 
Comprehensive Viva-Voce will be conducted by a Committee consisting of the 
Head of the Department and three Senior Faculty members of the Department. 
The Comprehensive Viva-Voce is aimed to assess the student’s understanding 
in various subjects studied during the B.Tech. course of study. The 
Comprehensive Viva-Voce is evaluated for 50 marks by the Committee. There 
will be no Midterm assessment for the Comprehensive viva-voce.

viii. The Project work shall be started by the student in the beginning of the IV year I 
Semester. Out of a total of 200 marks for the project work, 60 marks shall be 
for Midterm Evaluation and 140 marks for the Semester end Examination. 
The viva-voce shall be conducted by a committee comprising of an external 
examiner, Head of the Department and the project supervisor and one senior 
faculty. The evaluation of project work shall be conducted at the end of the IV
year II Semester. The Midterm Evaluation shall be on the basis of three Seminars conducted during the IV year II Semester for 30 marks by the committee consisting of Head of the Department, project supervisor and senior faculty member of the Department and for 30 marks by the supervisor of the project.

3. Semester end Examination
   (a) Theory Courses
   Each course is evaluated for 70 marks. Examination is of 3 hours duration.
   (b) Practical Courses
   Each lab course is evaluated for 70 marks. The examination shall be conducted by the laboratory teacher and another senior teacher concerned with the subject of the same/other department/Industry. One examiner may be appointed by the Chief Superintendent in consultation with HOD as and when required.
   (c) Supplementary Examinations
   Supplementary examinations will be conducted along with regular Semester end examinations.
   (During even Semester regular examinations: supplementary examinations of odd Semester and during odd Semester regular examinations: supplementary examinations of even Semester will be conducted).

4. Attendance Requirements
   i. A student shall be eligible to appear for the Semester end examinations if he acquires a minimum of 75% of attendance in aggregate of all the subjects for Semester.
   ii. Condonation of shortage of attendance in aggregate up to 10% (65% and above and below 75%) in a Semester may be granted by Institute Academic Committee.
   iii. A student will not be permitted to write the end examination and not promoted to the next Semester unless he satisfies the attendance requirement of the present Semester, as applicable. He may seek re-admission for that Semester when offered next.
   iv. Shortage of Attendance below 65% in aggregate shall in NO case be condoned.
   v. Students whose shortage of attendance is not condoned in any Semester are not eligible to take their end semester examination of that Semester.
   vi. A stipulated fee shall be payable towards condonation of shortage of attendance.

5. Minimum Academic Requirements
   The following academic requirements have to be satisfied in addition to the attendance requirements mentioned in item No.4.
i. A student shall be deemed to have satisfied the minimum academic requirements and earned the credits allotted to each theory or practical design or drawing subject or project, if he secures not less than 35% (25 out of 70 marks) of marks in the end examination and a minimum of 40% of marks in the sum total of the Midterm evaluation and end semester examination taken together.

ii. A student shall be promoted from II to III year only if he fulfils the academic requirement of 37 credits from the following examinations,

- Two regular and one supplementary examinations of I year I Semester
- One Regular and One Supplementary exam of I year II Semester
- One regular examination of II year I Semester irrespective

iii. A student shall be promoted from III year to IV year only if he fulfils the academic requirements of total 62 credits from the following examinations,

- Three regular and Two supplementary examinations of I B Tech I Semester.
- Two regular and Two Supplementary examinations for I B Tech II Semester
- Two regular and one supplementary examinations up to the end of II year I Semester.
- One regular and one supplementary examinations of II year II Semester.
- One regular examination of III year I Semester.

iv. A student shall register and put up minimum academic requirement in all 200 credits and earn the 200 credits. Marks obtained in all 200 credits shall be considered for the calculation of Cumulative Grade Point Average (CGPA).

v. In addition to the above 200 credits the student must complete the non credit courses also. The non-credit courses awarded with a grade of satisfactory or not satisfactory based on the attendance of the student. Minimum attendance for the non-credit course is 75%.

vi. The student should also register and complete any two value added courses offered by the Institute.

vii. Students who fail to earn 200 credits as indicated in the course structure within eight academic years from the year of their admission shall forfeit their seat in B.Tech. course and their admission stands cancelled.

6. Course pattern

i. The entire course of study is of four academic years. All the I, II, III and IV years are of Semester pattern.

ii. A student eligible to appear for the end semester examination in a subject, but absent or has failed in the end semester examination may reappear for that subject at the supplementary examination whenever conducted.
iii. When a student is detained due to shortage of attendance in any Semester, he may be re-admitted into that Semester when it is offered next, with the academic regulations of the batch into which he gets readmitted.

iv. When a student is detained due to lack of credits in any year, he may be eligible to be promoted or for promotion into the next year after fulfillment of the academic requirements, with the academic regulations of the batch into which he gets admitted.

Award of B.Tech. Degree and Class

A student will be declared eligible for the award of the B. Tech. Degree if he/she fulfills the following academic regulations:

i) Pursued a course of study for not less than four academic years and not more than eight academic years.

ii) Registered for 200 credits and secured 200 credits and other Academic Requirements.

iii) complete the non-credit courses and value added courses as per their course structure.

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

7. CGPA System:

Method of awarding absolute grades and grade points:

The absolute grading method is followed, based on the total marks obtained in internal and external examinations. Grades and grade points are assigned as per the Table given below.

**B.Tech Program**: The Absolute Grading Method is followed, based on the total marks obtained in internal and external examinations. Grades and Grade points are assigned as given below.

<table>
<thead>
<tr>
<th>Marks Obtained</th>
<th>Grade</th>
<th>Description of Grade</th>
<th>Grade Points (GP) Value Per Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;=90</td>
<td>O</td>
<td>Outstanding</td>
<td>10.00</td>
</tr>
<tr>
<td>&gt;=80 and &lt;89.99</td>
<td>A+</td>
<td>Excellent</td>
<td>9.00</td>
</tr>
<tr>
<td>&gt;=70 and &lt;79.99</td>
<td>A</td>
<td>Very Good</td>
<td>8.00</td>
</tr>
<tr>
<td>&gt;=60 and &lt;69.99</td>
<td>B</td>
<td>Good</td>
<td>7.00</td>
</tr>
<tr>
<td>&gt;=50 and &lt;59.99</td>
<td>C</td>
<td>Fair</td>
<td>6.00</td>
</tr>
<tr>
<td>&gt;=40 and &lt;49.99</td>
<td>D</td>
<td>Pass</td>
<td>5.00</td>
</tr>
<tr>
<td>&lt;40</td>
<td>F</td>
<td>Remedial</td>
<td></td>
</tr>
<tr>
<td>Not Appeared the Exam(s)</td>
<td>N</td>
<td>Absent</td>
<td></td>
</tr>
</tbody>
</table>
The student is eligible for the award of the B.Tech degree with the class as mentioned in the Table.

<table>
<thead>
<tr>
<th>CGPA</th>
<th>CLASS</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;= 7.5</td>
<td>First Class with Distinction</td>
</tr>
<tr>
<td>&gt;= 6.5 and &lt; 7.5</td>
<td>First class</td>
</tr>
<tr>
<td>&gt;= 5.5 and &lt; 6.5</td>
<td>Second Class</td>
</tr>
<tr>
<td>&gt;=5.0 and &lt; 5.5</td>
<td>Pass class</td>
</tr>
</tbody>
</table>

Calculation of Semester Grade Points Average (SGPA):
The performance of each student at the end of each semester is indicated in terms of SGPA. The SGPA is calculated as below:

\[
SGPA = \frac{\text{Total Earned Weighted Grade Points for that Semester}}{\text{Total Credits for the Semester}}
\]

\[
SGPA = \frac{\sum_{i=1}^{P} Ci \times Gi}{\sum_{i=1}^{P} Ci}
\]

Where ‘\(Ci\)’ = Number of Credits allotted to particular subject ‘\(i\)’
‘\(Gi\)’ = Grade Point corresponding to the letter grade awarded in that subject ‘\(i\)’
‘\(i\)’= 1,2,......\(P\) represent the number of subjects for that particular semester

* SGPA is calculated and awarded for the candidates who pass all the courses in a semester.

Calculation of Cumulative Grade Point Average (CGPA) for Entire Programme.
The CGPA is calculated as below:
Assessment of the overall performance of a student is obtained by calculating Cumulative Grade Point Average (CGPA), which is weighted average of the grade points obtained in all subjects during the course of study.

\[
CGPA = \frac{\sum_{i=1}^{m} Ci \times Gi}{\sum_{i=1}^{m} Ci}
\]
Where \( C_i \) = Number of credits allotted to a particular subject \( 'i' \)

\( G_i \) = Grade Point corresponding to the letter grade awarded in that subject \( 'i' \)

\( I = 1, 2, \ldots, m \) represent the number of subjects of the entire program.

Grade lower than D in any subject is not considered for CGPA calculation. The CGPA is awarded only when the student acquires the required number of credits prescribed for the program.

**Grade Card**
The grade card issued shall contain the following:

a) The credits for each subject offered in that semester

b) The letter grade and grade point awarded in each subject

c) The **SGPA/CGPA**

d) Total number of credits earned by the student up to the end of that semester.

e) Award list indicating the marks awarded to the student.

8. **Withholding of Results**

If the student has not paid dues to College, or if any case of indiscipline is pending against him, the result of the candidate may be withheld and he will not be allowed to go into the next higher Semester. The award or issue of the Degree may also be withheld in such cases.

9. **Transitory Regulations**

Students who have discontinued or have been detained for want of attendance or any other academic requirements, may be considered for readmission as and when they become eligible. They have to take up Equivalent subjects, as substitute subject in place of repetition of subjects as decided by the Institute Academic Committee.

10. **Minimum Instruction Days**

The minimum instruction days for each Semester shall be 90 instruction days.

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

12. **The decision of the Institute Academic Committee will be final in respect of equivalent subjects for those students who are transferred from other colleges. The procedure for permitting students to transfer from**
other colleges will be decided by the principal / Institute Academic Committee keeping the Government Rules in view.

13. **General**
   i. Where the words “he”, “him”, “his”, occur in the regulations, they include “she”, “her”, “hers”.
   ii. The academic regulations should be read as a whole for the purpose of any interpretation.
   iii. In the case of any discrepancy/ambiguity/doubt arises in the above rules and regulations, the decision of the Principal shall be final.
   iv. The College may change or amend any or all of the academic regulations or syllabi at any time and the changes or amendments made shall be applicable to all the students concerned with effect from the dates notified by the College.

14. **Academic Regulations for B.Tech. (Lateral Entry Scheme)**
   (Applicable for students admitted from the academic year 2013-2014)
   
   (i) A student shall register for all 150 credits and earn all the 150 credits. Marks obtained in all 150 credits shall be considered for the calculation of the class.
   
   (ii) A student who fails to earn 150 credits as indicated in the course structure within six academic years from the year of their admission shall forfeit their seat in B.Tech. programme and their admission stands cancelled.
   
   (iii) The same attendance regulations are adopted as that of B.Tech. Four year degree course.
   
   (iv) A student shall be promoted from third year to fourth year only on fulfilling the academic requirements of securing 37 credits from the following examinations.

   a. Two regular and one supplementary examination of II year I Semester
   b. One regular and one supplementary examination of II year II Semester
   c. One regular examination of III year I Semester.
      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 commencement of class work for IV year I Semester.
   
   (v) All other regulations as applicable to B.Tech. four year degree course will hold good for B.Tech. (Lateral Entry Scheme).
## 15. Malpractice Rules
### 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><strong>If the candidate:</strong></td>
<td></td>
</tr>
<tr>
<td>1. (a) Possesses or keeps accessible in examination hall, any paper, notebook, programmable calculators, Cell phones, pager, palm computers or any other form of material concerned with or related to the subject of the examination (theory or practical) in which he is appearing but has not made use of (material shall include any marks on the body of the candidate which can be used as an aid in the subject of the examination)</td>
<td>Expulsion from the examination hall and cancellation of the performance in that subject only.</td>
</tr>
<tr>
<td>(b) Gives assistance or guidance or receives it from any other candidate orally or by any other body language methods or communicates through cell phones with any candidate or persons in or outside the exam hall in respect of any matter.</td>
<td>Expulsion from the examination hall and cancellation of the performance in that subject only of all the candidates involved. In case of an outsider, he will be handed over to the police and a case is registered against him.</td>
</tr>
<tr>
<td>2. Has copied in the examination hall from any paper, book, programmable calculators, palm computers or any other form of material relevant to the subject of the examination (theory or practical) in which the candidate is appearing.</td>
<td>Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted to appear for the remaining examinations of the subjects of that Semester/year. The Hall Ticket of the candidate is to be cancelled.</td>
</tr>
<tr>
<td>3. Impersonates any other candidate in connection with the examination.</td>
<td>The candidate who has impersonated shall be expelled from examination hall. The candidate is also debarred and forfeits the seat. The performance of the original candidate who has been impersonated, shall be cancelled in all</td>
</tr>
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<td></td>
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<tr>
<td></td>
<td>the subjects of the examination (including practicals and project work) already appeared and shall not be allowed to appear for examinations of the remaining subjects of that semester/year. The candidate is also debarred for two consecutive semesters from class work and all end semester examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat. If the imposter is an outsider, he will be handed over to the police and a case is registered against him.</td>
</tr>
<tr>
<td>4.</td>
<td>Smuggles the Answer book or additional sheet or takes out or arranges to send out the question paper during the examination or answer book or additional sheet, during or after the examination.</td>
</tr>
<tr>
<td>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>
</tr>
</tbody>
</table>
6. Refuses to obey the orders of the Chief Superintendent/Assistant – Superintendent / any officer on duty or misbehaves or creates disturbance of any kind in and around the examination hall or organizes a walk out or instigates others to walk out, or threatens the officer-in-charge or any person on duty in or outside the examination hall of any injury to his person or to any of his relations whether by words, either spoken or written or by signs or by visible representation, assaults the officer-in-charge, or any person on duty in or outside the examination hall or any of his relations, or indulges in any other act of misconduct or mischief which result in damage to or destruction of property in the examination hall or any part of the College campus or engages in any other act which in the opinion of the officer on duty amounts to use of unfair means or misconduct or has the tendency to disrupt the orderly conduct of the examination.

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 are also debarred and forfeit their seats. In case of outsiders, they will be handed over to the police and a police case is registered against them.

7. Leaves the exam hall taking away answer script or intentionally tears of the script or any part thereof inside or outside the examination hall.

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
<table>
<thead>
<tr>
<th>No.</th>
<th>Rule Description</th>
<th>Consequence</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 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>If the student belongs to the college, expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred and forfeits the seat. Person(s) who do not belong to the College will be handed over to police and, a police case will be registered against them.</td>
</tr>
<tr>
<td>10.</td>
<td>Comes in a drunken condition to the examination hall.</td>
<td>Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year.</td>
</tr>
<tr>
<td>11.</td>
<td>Copying detected on the basis of internal evidence, such as, during valuation or during special scrutiny.</td>
<td>Cancellation of the performance in that subject and all other subjects the candidate has appeared including practical examinations and project work of that semester/year.</td>
</tr>
</tbody>
</table>
12. If any malpractice is detected which is not covered in the above clauses 1 to 11 shall be reported to the academic council of the Institute for further action to award suitable punishment.

**Malpractices identified by squad or special invigilators**

Punishments to the candidates as per the above guidelines.

**Malpractice identified at Spot center during valuation**

The following procedure is to be followed in the case of malpractice cases detected during valuation, scrutiny etc. at spot center.

1) Malpractice is detected at the spot valuation. The case is to be referred to the malpractice committee. Malpractice committee will meet and discuss/question the candidate and based on the evidences, the committee will recommend suitable action on the candidate.

2) A notice is to be served to the candidate(s) involved through the Principal to his address and to the candidate(s) permanent address regarding the malpractice and seek explanations.

3) The involvement of staff who are in charge of conducting examinations, invigilators valuing examination papers and preparing / keeping records of documents relating to the examinations in such acts (inclusive of providing in correct or misleading information) that infringe upon the course of natural justice to one and all concerned at the examinations shall be viewed seriously and recommended for award of appropriate punishment after thorough enquire.

4) Based on the explanation and recommendation of the committee action may be initiated.

5) **Malpractice committee:**
   
   i. Controller of Examinations Chairman
   
   ii. Assistant controller of Evaluation Member
   
   iii. Chief Examiner of the subject/subject expert Member
   
   iv. Concerned Head of the Department Member
DEPARTMENT OF INFORMATION TECHNOLOGY

VISION

Promote a stimulating and productive environment of work, study, and interactive learning for students and staff

MISSION

Inculcate the value of learning, self-worth and quality performance among students and staff, and transition of students for productive and responsible participation in society
Programme Educational Objectives (PEOs):

I. To provide students with a solid foundation in the scientific, mathematical, and Engineering fundamentals necessary to formulate, analyze, solve engineering problems.

II. To prepare students to meet the challenges in IT Industry regarding Analysis, Design and Development of various types of Projects that meet the needs of National and Global Companies, and also to prepare them for pursuing higher studies and research.

III. To develop the understanding for specification, planning, designing, implementation and deployment of software project by providing the sufficient knowledge of Software Engineering, Modeling, Security and Information Retrieval Systems.

IV. Ability to enhance the analytical skills of the students with the faculty expertise by bringing the real world into labs through a specially designed VNR protocol. And also enlarging the technological horizon of students beyond curriculum through seminars, and workshops.

V. To organize special training programmes on modern IT skills to pursue certification courses through Oracle, Computer Network Certification.

VI. To train students with broader scientific and engineering knowledge by providing multidisciplinary courses with emphasis on Digital, Microprocessor and embedded systems, so as to achieve ability to comprehend, analyze, design and create novel products with innovative ideas.

VII. To develop effective communication skills, managerial skills, team spirit, multi disciplinary approach with social commitment and optimal utilization of resources as an IT professional.

VIII. Ability to convert innovative ideas in to high end projects and to convert it into a marketable product in collaboration with industry by providing with the sufficient knowledge of Cloud Computing, Virtualization, and Web 2.0.

IX. IT Professional endeavors enable the graduate to meet the legal and ethical responsibilities and to engage in life-long learning, to advance the economic and social development at the National and global levels through technology transfer.
Program Outcomes (POs):

The program demonstrates that the graduate is

a) Graduates will have an understanding of the fundamental mathematical, logical, statistical, and scientific principles, emphasizing computing and information processing.

b) An ability to identify and analyze the user needs and take them in to account for Selection, Creation, Evaluation and Administration of Computer-based systems like –Institute Management, Cart and Inventory Management.

c) The core competence in the field of IT addresses a wide range of strategic, managerial and operational activities involved in gathering, processing, storing, distributing and use of information, and its associated technologies like SE, OS, WT, DBMS, CN, in developing applications for various organizations.

d) Graduate will demonstrate an ability to visualize and work on laboratory to understand the performance of different types of projects.

e) Through VNR protocols, students are able to acquire in depth knowledge and can apply this mode of inquiry in an application development like search engine.

f) Ability to acquire and apply fundamental principles of electronics, microprocessor, microcontrollers and embedded Systems.

g) Graduate to be a multi-skilled engineer with good technical knowledge in robotics and automation fields to develop knowledge based systems.

h) Ability to understand software engineering principles and apply them to design, develop, implement and deploy with extensive security features.

i) Students to engage actively in research, consulting, and/or other professional activities, both to advance individual professional competence and to integrate new knowledge into the educational programs like Oracle Workforce Development plan.

j) Develop a sense of personal responsibility and accountability for one’s individual actions and performance. Apply personal goal setting, decision making skills, and time management concepts.

k) Work effectively in teams with people of diverse backgrounds at all corporate levels.

l) Graduates able to develop “win-win” approaches for conflict resolution and assess feasibility, risk of the projects.
m) Students can apply information technology principles and practices to a variety of problems, with the understanding of social, professional, and ethical issues related to computing.

n) Ability to update his knowledge with the latest technologies by involving in distinct domain projects like web OS.

o) Recognize the need for continued learning by participating and succeeding in competitive examinations like GATE, GRE, CAT and also pursue research.
### B. TECH Information Technology (R12)

#### I YEAR I SEMESTER

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# Course Structure

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UNIT I
Differential Calculus
Mean value theorems - Rolle's theorem, Lagrange's theorem, Cauchy's theorem, and
generalized mean value theorem (Taylor's Theorem) (statements only), Curvature and
Radius of curvature, Curve tracing – Cartesian, polar and parametric curves(standard
curves only)

UNIT II
Functions of Several Variables
Partial differentiation; Euler's theorem, Functional dependence; Jacobian; Maxima and
Minima of functions of two variables with constraints and without constraints.

UNIT III
Improper integrals and Multiple integrals
Improper Integrals; Beta, Gamma, and Error integrals - Properties and simple
applications. Applications of integration to lengths, volumes and surface areas in
cartesian and polar coordinates. Multiple integrals - double and triple integrals, change
of variables ( Cylindrical and Spherical polar coordinates) and change of order of
integration.

UNIT-IV
Vector calculus
Introduction to vector and scalar functions; gradient, curl, divergence, and their related
properties of sums and products; Laplacian and second order operators; Vector
integration - line integral, work done, potential function; Area, surface, and volume
integrals; Statements of Vector integral theorems and their verification (without proofs)
- Green's theorem, Stoke's theorem, and Gauss divergence theorem.

UNIT V
Elementary analysis
Sequences and series - convergence and divergence, ratio test, comparison test,
integral test, Cauchy's root test, Raabe's test (statements only for the tests), and
absolute and conditional convergence.
TEXT BOOKS
1. Calculus and Analytic Geometry by Thomas and Finney, 9th edition; Publisher: Pearson Education.

REFERENCES
1. Elementary Analysis: The Theory of Calculus by Kenneth Ross; Publisher: Springer
2. Advanced Engineering Mathematics by Erwin Kreyszig, 8th edition; Publisher: John Wiley.
(PHY1101) ENGINEERING PHYSICS

UNIT I: INTERFERENCE:
Superposition principle, resultant amplitude, coherence, methods to obtain coherent sources, interference, Young’s double slit experiment, interference in thin films by reflection, Newton’s rings Experiment

DIFFRACTION-I:
Distinguish between Fraunhofer and Fresnel diffraction, diffraction at single slit (Qualitative and Quantitative (Phasors approach)).

UNIT II: DIFFRACTION-II
Diffraction at double slit, circular aperture, and multiple slits (grating) (Qualitative Approach), Resolution of spectral lines, Rayleigh criterion, and resolving power of grating.

POLARIZATION
Polarization phenomenon, Brewster’s Law and Malus law, examples, types of polarization, double refraction, Nicol prism, Quarter and Half wave plates

UNIT III: LASERS:

FIBER OPTICS:
Principle of optical fiber and properties – Acceptance angle and acceptance cone – Numerical aperture – Types of fibers and refractive index profiles – Qualitative analysis of attenuation in optical fibers – Application of optical fibers.

UNIT IV: ELEMENTS OF STATISTICAL MECHANICS:
Maxwell-Boltzmann, Bose-Einstein and Fermi-Dirac statistics (non-mathematical treatment); Photon gas, Planck’s law of black body radiation; Deduction of Wien’s law and Rayleigh-Jeans law from Plank’s law.

PRINCIPLES OF QUANTUM MECHANICS:
UNIT V: FREE ELECTRON FERMI GAS:
Energy levels in one dimension, Effect of temperature on the Fermi-Dirac distribution, Free electron gas in three dimensions, electrical conductivity & Ohm’s law, Electrical Resistivity of Metals (Qualitative).

BAND THEORY OF SOLIDS:
Electron in a periodic potential; Bloch Theorem; Kronig-Penney model (non-mathematical treatment); Origin of energy band formation in solids; Classification of materials into conductors, semiconductors & Insulators; and Concept of effective mass of an electron.

TEXT BOOKS:
(1) Physics vol.2, by Halliday, Resnick and Krane; John Wiley & Sons
(3) Introduction to Solid State Physics by Charles Kittel : John Wiley & Sons

REFERENCE BOOKS:
(1) Engineering Physics by R.K.Gaur and S.L.Gupta; Dhanpat Rai and Sons
(2) Applied Physics by P.K.Mittal, IK International Publishing House (P) Ltd.
(3) Optics by Ghatak and Thyagarajan, Tata Mc Graw
(4) Engineering Physics by G Sahashra Buddhe; University Press
(5) Elements of Solid State Physics by J.P.Srivatsva, PHI Publishers
(6) Engineering Physics by Dr M Chandra Shekar and Dr P. Appala Naidu, VGS Book links.
(7) Introduction to Optical Communication by G. Keiser
(8) Quantum Mechanics by Gupta Kumar Sharma
UNIT I
Electrochemical cells and batteries
Conductance-factors effecting conductance, conductometric titrations; cells: types of cells, cell representation, electrode potential; Standard electrode potential; Electrochemical series; Nernst equation; Reference electrodes – hydrogen, calomel electrode; Ion selective electrodes (glass electrode & fluoride electrode); Numerical problems.

Batteries
Primary and secondary cells (lead-acid cell; Ni-Cd cell; lithium cells); Applications of batteries; Fuel cells – methanol – oxygen fuel cells, advantages of fuel cells; Solar cells - principle, and applications.

UNIT II
Corrosion and its control
Introduction; Causes and effects of corrosion; Different types of corrosion; Theories of corrosion – chemical, electrochemical corrosion (reactions); Factors affecting corrosion – nature of metal (galvanic series; over voltage; purity of metal; nature of oxide film; nature of corrosion product), and nature of environment (effect of temperature; effect of pH; humidity; effect of oxidant).
Corrosion control methods – cathodic protection, sacrificial anode, and impressed current cathode;
Surface coatings – methods of application on metals (hot dipping; galvanizing; tinning; cladding; electroplating), and organic surface coatings (paints - constituents and functions).

UNIT III
III a) Polymers
Introduction; Types of polymerization; Plastics - thermoplastic resins, and thermoset resins; Compounding & fabrication of plastics; Preparation, properties, and engineering applications of polyethylene, PVC, PS, Teflon, bakelite, nylon.

III b) Rubber
Natural rubber- processing, vulcanization; Elastomers (Buna-s; Butyl rubber; Thiokol rubbers); Fiber reinforced plastics (FRP) and their applications.
UNIT IV

Water
Introduction; Hardness - causes, expression of hardness, units, types of hardness, estimation of temporary & permanent hardness of water, and numerical problems; Boiler troubles – scale & sludge formation, caustic embrittlement, corrosion, priming & foaming; Softening of water (Internal & external treatment - lime soda, zeolite, ion exchange process, and numerical problems); Reverse osmosis and Electro dialysis (desalination processes).

UNIT V

Nanomaterials
Introduction; Preparation and applications of nanomaterials with special reference to carbon nanotubes.

Insulators
Classification of insulators; characteristics of thermal & electrical insulators and their applications; Superconductors - Nb-Sn alloy, YBa$_2$Cu$_3$O$_7-x$; Applications of superconductors.

TEXT BOOKS
1. Text Book of Engineering Chemistry by Y.Bharathi Kumari, Jyotsna Cherukuri; Publisher: VGS Book Links.
2. Engineering Chemistry by P.C.Jain & Monica Jain, Publisher: Dhanpatrai Publishing Company.

REFERENCES
1. Text Book of Engineering Chemistry by S.S. Dhara & Mukkanti; Publisher: S.Chand & Co.
2. Engineering Chemistry by O.G Palanna
(ENG1101) ENGLISH

Introduction
This is the age of information and communication technologies. Engineers and technical professionals need to convey technical information in English for various purposes. Besides learning general English as an international language, engineering students need to be equipped with adequate writing ability so that they can communicate technical information clearly on at least a basic level. A good English writing proficiency can be a contributing factor to professional recognition and career prospects. This course teaches those writing strategies that scientists, engineers, and others will need in order to write successfully on the job. It initiates the students into Technical Writing. The purposes of technical writing are to inform and persuade. This program aims to train students in writing clear, concise and effective English. This Syllabus is therefore, a Pragmatic English Writing Program for engineering students with intermediate proficiency. The program covers a syllabus outline and instructional approaches on basic writing skills with particular reference to technical writing.

Objectives:

i) To equip the students with all the LSRW skills for advanced writing and speaking.
ii) To equip the students with basic grammar, infrastructural patterns and grammatical constructions required of in technical writing.
iii) To acquaint the students with the writing process, beginning with paragraph writing. This would prepare them for academic and workplace writing.
iv) Equip the students with Oral Communication Skills.

Methodology
A Task-based, process oriented methodology will be used by the teachers to give a practical orientation to the teaching of language. An inductive approach will be used to demonstrate the use of language in context. This should enable the students to internalize the language structures and vocabulary used in context. Students will be exposed to numerous examples and ample practice will be given in the contextual use of language structures.
Syllabus Outline

Unit I : Review of Grammar
i) Common Errors v) Use of Articles and Prepositions
ii) Subject-Verb Agreement vi) Conjunctions
iv) Adverbs vii) Pronoun reference
iv) Transitional elements

Unit II : Prose 1
1. Heaven’s Gate by Pico Iyer
2. The Connoisseur by Nergis Dalal

Unit III : Reading and Writing Skills
i) Reading Comprehension -- Skimming & scanning
ii) Reading Comprehension -- Intensive reading
iii) Reading Comprehension -- Critical Analysis
iv) Paragraph Writing
v) Letter Writing
vi) Memo Writing

Unit IV : Prose 2
1. The Cuddalore Experience by Anu George
2. The Odds Against Us by Satyajit Ray

Unit V : Advanced Writing Skills
1. Comparison and Contrast Pattern
2. Cause and Effect Pattern
3. Classification
4. Analogy
5. Problem-Solution Pattern

TEXT BOOKS:
1. Enjoying Everyday English by A. Ramakrishna Rao
2. Effective Technical Communication by Ashraf Rizvi

REFERENCES:


(CSE1101) COMPUTER PROGRAMMING

UNIT - I

UNIT - II
Selection Statements – if and switch statements, Repetitive statements – while, for, do-while statements, C Programming examples, other statements related to looping – break, continue, go to, C Programming examples.
Arrays – Basic concepts, one-dimensional arrays, two – dimensional arrays, multidimensional arrays, C programming examples.

UNIT - III
Introduction to Structured Programming, Functions- basics, user defined functions, inter function communication, Standard functions, Storage classes-auto, register, static, extern, scope rules, arrays to functions, recursive functions, example C programs.
Strings – Basic concepts, String Input / Output functions, arrays of strings, string handling functions, strings to functions, C programming examples.

UNIT - IV
Derived types – Structures – Basic concepts, nested structures, arrays of structures, structures and functions, unions, bit fields, C programming examples.
Pointers – Basic concepts, pointers and functions, pointers and strings, pointers and arrays, pointers and structures, self referential structures , example C programs.

UNIT – V
Preprocessor Directives, Dynamic Memory Allocation
File I/O – Basic concepts, text files and binary files, file input / output operations, file status functions (error handling), C programming examples, Command-Line Arguments.
TEXT BOOKS:
2. C How to Program Paul Deitel and Harvey Deitel, PH

REFERENCES:
1. Let Us C Yashavant Kanetkar BPB
2. The C Programming Language by Brian W. Kernighan, Dennis M. Ritchie
UNIT – I
Introduction to Electrical Engineering: Basic circuit components, types of elements, Ohm’s law, types of sources, Kirchhoff’s laws, resistive networks, inductive networks, capacitive networks, star-delta and delta-star transformation, simple problems.

UNIT-II
Alternating Quantities: Principle of ac voltages, waveforms and basic definitions, root mean square and average values of alternating currents and voltages, form factor and peak factor, phasor representation of alternating quantities, the J operator and phasor algebra, analysis of ac circuits with single basic network element, single phase series circuits, simple problems.

UNIT-III
Direct current machines: Principle of operation and construction of a dc machine, e.m.f equation, Torque production in a dc machine, Types of DC machines (All the above topics are only qualitative treatment).

UNIT-IV
Transformers: Principle of operation, Constructional Details, Ideal Transformer and Practical Transformer, Losses, Open circuit and short circuit Tests, Efficiency and Regulation (All the above topics are only elementary treatment and simple problems).

UNIT V

TEXT BOOKS:
1. Basic Electrical Engineering - By M.S.Naidu and S. Kamakshiah – TMH.
3. Electrical and Electronic Technology – By Hughes- Pearson Education.

REFERENCES :
4. Electrical circuits by Sudhkar and Shyam Mohan-TMH
The English language Communication Skills Lab aims to provide practice in all the four skills of LSRW, with a special emphasis on listening and speaking skills.

**Syllabus for Lab Sessions**

### Unit 1

**Multimedia Lab**
1. Sounds of English
2. Listening Comprehension
3. Vocabulary Lesson 1

**Communication Skills Lab:** Introduction of Self and others

### Unit 2

**Multimedia Lab**
1. Grammar --- Nouns and Pronouns; The Present Tense
2. Vocabulary Lesson 2
3. Listening Skills

**Communication Skills Lab:** Seeking and Giving Information

### Unit 3

**Multimedia Lab**
1. Grammar --- Articles; The Past Tense
2. Vocabulary Lesson 3
3. Telephoning Skills

**Communication Skills Lab:** Giving and Taking Instructions

### Unit 4

**Multimedia Lab**
1. Grammar --- Concord; The Future Tense
2. Vocabulary Lesson 4
3. Listening Comprehension

**Communication Skills Lab:** Role Play/ Situational Dialogues

### Unit 5

**Multimedia Lab**
1. Grammar --- Adjectives, adverbs, conjunctions
2. Vocabulary -- Lesson 5

**Communication Skills Lab**:
1) JAM/ Short Talk
   ii) Information Transfer
      a) Data Analysis
      b) Interpretation of Graph
Multimedia Lab Requirements
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:

iv) **P – IV Processor**
   a) Speed – 2.8 GHZ
   b) RAM – 512 MB Minimum
   c) Hard Disk – 80 GB
   v) Headphones of High quality

5. **Suggested Software:**
The software consisting of the prescribed topics elaborated above should be procured and used.

**Suggested Software:**
- Clarity Pronunciation Power – part II
- Oxford Advanced Learner’s Compass, 7th Edition
- DELTA’s key to the Next Generation TOEFL Test: Advanced Skill Practice.
- Lingua TOEFL CBT Insider, by Dreamtech
- TOEFL & GRE (KAPLAN, AARCO & BARRONS, USA, Cracking GRE by CLIFFS)

Multimedia Lab Requirements
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.

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Computer network with Lan with minimum 60 multimedia systems with the following specifications:
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   a) Speed – 2.8 GHZ
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   o Oxford Advanced Learner’s Compass, 7th Edition
   o DELTA’s key to the Next Generation TOEFL Test: Advanced Skill Practice.
   o Lingua TOEFL CBT Insider, by Dreamtech
   o TOEFL & GRE (KAPLAN, AARCO & BARRONS, USA, Cracking GRE by CLIFFS)
Week 1
  a. Basic Linux commands
  b. Simple C programs - to implement basic arithmetic operations – sum, average, product, smallest, largest of the numbers, difference, quotient and remainder of given numbers etc.

Week 2
  Programs on if, else-if, nested if, else if ladder - largest and smallest of given numbers, to find the grade of a student based on marks, roots of a quadratic equation etc.

Week 3
  a. Programs on switch-case – to check the type of a given character, to find the grade of a student etc.
  b. Programs on while and do-while - to find factorial, Fibonacci series, GCD, sin(x), cos(x) series , to check whether a given number is an Armstrong, Palindrome, Perfect, number conversion, and Prime number etc.

Week 4
  Programs on for loop- sum of n natural numbers, factorial, sin(x), to generate Pascal’s triangle etc.

Week 5
  a. Programs on nested loops – check for Fibonacci prime, Pyramids of numbers, generation of prime numbers in the given range, multiplication table etc
  b. programs using break, goto, continue.

Week 6
  a. Programs on 1-D array-finding Minimum and maximum element ,Sorting and Searching etc.
  b. Programs on 2-D array – Sum, product and Multiplication of two Matrices etc.

Week 7
  a. Programs on Functions-Implementation of user defined functions categories, passing of arrays to functions etc.
  b. Programs on recursion - factorial of a given integer, GCD of two given integers etc.

Week 8
  a. Programs on String handling functions-Copying, reverse, substring, concatenation.
  b. Programs on structure and unions.
Week 9
  **Midterm exam**

Week 10
  Programs using pointers- pointer basic operations, pointers and functions etc

Week 11
  Programs on pointers and structures, Pointers and arrays, pointers and strings.

Week 12
  Programs on files-Implementation of file handling functions.

Week 13
  a. Programs on files error handling.
  b. Programs on Dynamic memory allocation

Week 14
  Programs on command line arguments.

Week 15
  Programs on preprocessor directives

Week 16
  **Internal Lab Exam**
Any Eight Experiments from the following:

1. Dispersive Power of the material of a Prism using Spectrometer
2. Diffraction Grating (both with Laser and non laser source)
3. Single Slit with laser light
4. Newton’s Rings
5. Finding thickness of a thin wire or sheet by forming a wedge shaped film
6. Energy gap of a semiconductor material
7. To determine the rigidity modulus of material of a wire
8. Melde’s experiment
9. Sonometer Experiment
10. AC frequency by sonometer method
11. Numerical Aperture and Acceptance angle of an optical fiber cable
12. Attenuation and Bending losses in optical fiber
13. Stewart Gee’s experiment
15. Photo cell/ Solar Cell


LIST OF EXPERIMENTS

1. Titrimetry
   a) Estimation of hardness of water by EDTA method.

2. Instrumental methods
   (i) Conductometry
      a) Conductometric titration of strong acid vs strong base
   (ii) Colorimetry
      a) Estimation of copper by colorimetric method
   (iii) pH metry
      a) Titration of strong acid vs strong base by pH metry

3. Physical properties
   a) Determination of viscosity of sample oil by Redwood viscometer.

4. Preparations:
   a) Preparation of soap
   b) Preparation of Nano particles.
TEXT BOOKS
1. Laboratory Manual on Engineering Chemistry by S.K.Bhasin and Sudha Rani; Publisher: Dhanpat Rai.
2. Laboratory Manual on Engineering Chemistry by Y.Bharathi Kumari and Jyotsna Cherukuri; Publisher: VGS Book Links.
LINEAR ALGEBRA

UNIT I
Solution of linear systems
Matrices and linear systems of equations - elementary row transformations, Rank, row Echelon form, and normal form; Solution of linear systems - direct methods - LU decomposition, LU decomposition from Gauss elimination, and solution of Tri-diagonal systems by Thomas algorithm; Eigen values, eigen vectors, and their properties - Linear dependence and independence; Cayley-Hamilton theorem (without proof) - inverse and powers of a matrix by Cayley-Hamilton theorem, diagonalization of a matrix, calculation of powers of a matrix; Modal and spectral matrices.

UNIT II
Linear transformations
Real matrices - symmetric, skew symmetric, and orthogonal linear transformation; Complex matrices - Hermitian, Skew-Hermitian and unitary matrices; Quadratic forms - reduction of quadratic form to canonical form, rank, positive, negative definite, semi definite, index, signature, Sylvester law, and singular value decomposition.

ORDINARY DIFFERENTIAL EQUATIONS

UNIT III
Ordinary differential equations and their applications
Differential equations of first order and first degree - Linear, Bernoulli and exact differential equation; Applications of differential equations of first order and first degree - Newton’s law of cooling, Law of natural growth and decay, Orthogonal trajectories, and basic circuits.

UNIT IV
Differential equations of higher order and their applications
Differential equations of higher order - homogeneous and non-homogenous type, differential equations of second order and higher order with constant coefficients with right hand side term of the type $e^{ax}$, sin (ax), cos (ax), polynomials in x, $e^{ax}$ V(x), x V(x), and method of variation of parameters and Euler-Cauchy’s 2nd order differential equations, applications to mechanical systems and Simple harmonic motion.
UNIT V
Laplace transform and application to ODE
Laplace transform of standard functions; Inverse transform-first shifting theorem; Dirac's delta function; Convolution theorem; Periodic function; Differentiation and integration of transforms; Application of Laplace transforms to ordinary differential equations.

TEXT BOOKS
2. A First Course in Differential Equations by Dennis G. Zill; Publisher: Brooks Cole.

REFERENCES
1. Advanced Engineering Mathematics by Erwin Kreyszig, 8th edition; Publisher: John Wiley.
3. Elementary Differential Equations and Boundary Value Problems by William E. Boyce and Richard C. Diprima; Publisher: Wiley.
4. Linear Algebra and its applications by David C Clay; Publisher: Pearson Education.
NUMERICAL ANALYSIS AND LINEAR PROGRAMMING

NUMERICAL ANALYSIS

UNIT I
Solutions of non-linear systems
Introduction; Mathematical preliminaries; Solution of algebraic and transcendental equations – the bisection method, the method of false position, the iteration method, Newton - Raphson method, and their order of convergence.

UNIT II
Interpolation
Introduction; Errors in polynomial interpolation; Finite differences; Forward differences; Backward differences; Central differences; Symbolic relations and separation of symbols; Differences of a polynomial; Newton’s formulae for interpolation; Central difference interpolation formulae; Gauss’s central difference formulae; Lagrange and Hermite interpolation formulae; Cubic spline interpolation.

UNIT III
Numerical Integration
Trapezoidal rule, Simpson’s 1/3 rule, and Simpson’s 3/8 rule.

Numerical solutions of ordinary differential equations
Solution of initial value problems by Taylor’s series - Picard’s method of successive approximations, Euler’s method, and Runge - Kutta methods; Predictor Corrector methods - Adams Moulton method, and Milne’s method.

UNIT IV
Numerical solutions of partial differential equations (PDE)
Introduction; Classification of second order PDE; Approximation of derivatives by finite difference method; Solution of Laplace equation - Jacobi’s method, Gauss-Seidal (Leibmann’s) method, Solution of parabolic equations by explicit and crank Nicolson implicit scheme method; Solution of hyperbolic equations. LINEAR PROGRAMMING

UNIT V
Linear programming
TEXT BOOKS
2. Elementary Numerical Analysis by Dr. B.S. Grewal, 4th edition, Publisher: Khanna Publishers

REFERENCES
1. Advanced Engineering Mathematics by Erwin Kreyszig, 8th Edition; Publisher: John Wiley and Sons.
2. Advanced Engineering Mathematics by Peter V. O'Neil, 9th Edition; Publisher: Cengage Lear
VNR Vignana Jyothi Institute of Engineering & Technology

I Year B.Tech CSE&IT – II Sem

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(APHY1104) APPLIED PHYSICS
(Common for CSE & IT)

UNIT -1
ADVANCED QUANTUM MECHANICS:
Schrodinger equation revisited: Time dependent wave equation, Linearity and Superposition, Expectation values and Operators (Position, Momentum and Energy operators), Finite Potential well, Tunnel Effect, Problems.

UNIT -2
SEMICONDUCTOR PHYSICS:

PHYSICS OF SEMICONDUCTOR DEVICES:
Formation of p-n junction – open circuit p-n junction – Energy diagram of diode – i/v characteristics of p-n junction diode – p-n diode as a rectifier – Diode equation – Introduction to LED, BJT and FET.

UNIT -3
MAGNETIC PROPERTIES OF MATERIALS:

UNIT -4
DIELECTRIC PROPERTIES:

UNIT -5
SUPERCONDUCTORS:
Experimental survey and superconductivity phenomenon, – Meissner effect – Critical fields and Persistent currents, Type I and Type II superconductors - London equations- penetration depth-flux quantization-BCS Theory- Josephson Effect– High temperature Superconductors, Applications of Superconductors.
TEXT BOOKS:
3. Electronic Devices and circuits by Milliman and Halkias

REFERENCES
1. Engineering Physics by Dr M Chandra Shekar and Dr P. Appala Naidu, VGS Book links.
2. Engineering Physics by G Sahashra Buddhe; University Press
3. Quantum Mechanics by Gupta Kumar Sharma
4. Elements of Solid State Physics by J.P. Srivatsva, PHI Publishers
5. Engineering Physics by M.R. Srinivasan, New Age Publishers
UNIT-I
Introduction, Definition, scope and importance, Ecosystems: Introduction, types, characteristic features, structure and functions of ecosystems. Bio geo chemical cycle, Classification of Eco system.

UNIT-II
Natural Resources :classification of Resources, Land resources, Land as resource, Common property resources, Land degradation, Soil erosion and desertification, Effects of modern agriculture, fertilizer –pesticide problems, Forest resources, Use and over-exploitation. Mining and dams – their effects on forest and tribal people, Water resources, Use and over- utilization of surface and groundwater, Floods, droughts, Water logging and salinity, Dams –benefits and costs, Conflicts over Water. Energy resources

UNIT III
Bio-diversity and its conservation, Value of bio-diversity -consumptive and productive use, social, ethical, aesthetic and option values, Bio-geographical classification of India – India as a mega diversity habitat, Threats to bio-diversity –Hot-spots, habitat loss, poaching of wild life, loss of species, seeds, etc. Conservation of bio-diversity – Insitu and Ex-situ conservation.

UNIT IV
Environmental Pollution –Local and Global Issues, Nature of thermal pollution and nuclear hazards, Global warming, Acid rain, Ozone depletion. Environmental case studies.

UNIT V
Environmental Problems in India, Drinking water, sanitation and public health, Effects of the activities on the quality of environment, Water scarcity and groundwater depletion, Controversies on major dams – resettlement and rehabilitation of people: problems and concerns, Rain water harvesting, cloud seeding and watershed management. Economy and Environment, The economy and environment interaction, Economics of development, preservation and conservation, Sustainability: theory and practices, Limits to growth, Equitable use of resources for sustainable life styles, Environmental Impact Assessment.
TEXT BOOKS
1. Introduction to Environmental Science by Y. Anjaneyulu, BS Publications
2. Text book of Environmental studies by Deeksha Dave, Cengage publishers

REFERENCES:
2. Text book of Environmental studies by S V S Rana, Rastogi Publications
3. Text book of Environmental studies by Dr. K Raghavan Nambiar, Scitech Publishers
UNIT-1
Data Structures – Introduction to Data Structures, abstract data types, Linear list – singly linked list implementation, insertion, deletion and searching operations on linear list, circular linked list implementation, Double linked list implementation, insertion, deletion and searching operations. Applications of linked lists.

UNIT – 2
Stacks-Operations, array and linked representations of stacks, stack applications-infix to postfix conversion, postfix expression evaluation, recursion implementation.

UNIT-3
Queues-operations, array and linked representations. Circular Queue operations, Dequeues, applications of queue.

UNIT-4
Trees – Definitions, Binary tree representation, Binary search tree, binary tree traversals.
Graphs – Definitions, Graph representations, Graph traversals.

UNIT-5
Searching and Sorting – Big O Notation, Sorting- selection sort, bubble sort, insertion sort, quick sort, merge sort, Searching-linear and binary search methods.

TEXT BOOKS:
2. Data Structures Using C (Paperback) by Aaron M. Tenenbaum

REFERENCES:
3. C Programming & Data Structures, E. Balagurusamy, TMH.
UNIT – I
Introduction to engineering graphics – construction of ellipse, parabola and hyperbola – cycloidal curves.

UNIT – II
Orthographic projections of points, lines and planes – axis inclined to one planes and inclined to both the planes.

UNIT – III
Orthographic projections of solids:
Cylinder, cone, prism, pyramid and sphere positions and axis inclined to both the planes.

UNIT – IV
Isometric Scale, Isometric drawing and Isometric projections of lines, planes and simple solids.

UNIT – V
Conversion of orthographic views into isometric views for simple objects. Construction of orthographic projections for given isometric projections.

TEXT BOOKS:
1. Engineering drawings By N.D.Bhatt.

REFERENCES:
1. Engineering drawing and graphics: Venugopal/ New age
2. Engineering drawing : Johle / TMH
TRADES FOR EXERCISES
At least two exercises from each trade:
1. Carpentry
2. Fitting
3. Welding
4. Electrical Wiring
5. Lathe Operations

IT WORKSHOP EXERCISES
1. Computer Hardware: Identification of Peripherals
2. Assembling and disassembling of a PC
3. Simple diagnostic exercises – Related to hardware
4. Installation of Windows Operating System
5. Installation of Linux Operating System
6. Linux Basic Commands
7. Simple diagnostic exercises – Related to Operating System

TEXTBOOKS
5. PC Hardware and A+ Handbook – Kate J. Chase PHI (Microsoft)
WEEK1:
1. Write a program for creation, Search and Traversal of Single Linked List
2. Write a program to perform insertion and deletion operations in Single Linked List
3. Write a program to merge two single linked lists

WEEK2:
1. Write a program for creation, Search and Traversal of Circular Linked List
2. Write a program to perform insertion and deletion operations in Circular Linked List

WEEK 3:
1. Write a program for creation, Search and Traversal of Double Linked List
2. Write a program to perform insertion and deletion operations in Double Linked List

WEEK 4:
1. Write a program to implement stack using Arrays
2. Write a program to implement stack using Linked List

WEEK 5:
1. Write a program to convert infix expression to postfix expression using stack
2. Write a program to evaluate postfix expression

WEEK 6:
1. Programs using recursion
2. Write a program to convert infix expression to prefix expression using stack

WEEK 7:
1. Write a program to implement Linear queue using Array
2. Write a program to implement Linear queue using Linked List

WEEK 8:
1. Write a program to implement insertions and deletions in a circular Queue
2. Write a program to perform search and count operations in a circular queue

WEEK 9:
1. Write a program to implement insertions and deletions in a Dequeue
2. Write a program to perform search and count operations in Dequeue

WEEK 10: Midterm Exam

WEEK 11:
1. Write a program to implement Linear search
2. Write a program to implement Binary Search
WEEK 12:
1. Write a program to implement Selection sort
2. Write a program to implement Bubble sort
3. Write a program to implement Insertion sort

WEEK 13:
1. Write a program to implement Merge sort
2. Write a program to implement Quick sort

WEEK 14:
1. Implementation of a binary tree representation using Arrays
2. Write a program to implement tree traversals.

WEEK 15:
1. Implementation of a Graph representation using Adjacency Matrix
2. Write a program to implement graph traversals.

WEEK 16: Final Internal Lab Exam
(ENG1202) ENGLISH LANGUAGE COMMUNICATION SKILLS LABORATORY-II

In continuation with the first Year I semester syllabus, this course offers further practice in Listening, Speaking, and Grammar in preparation for the advanced speaking and writing skills offered in the III Year.

Unit I

Multimedia Lab:
1. Grammar – Active and Passive Voice
2. Vocabulary Lesson 6
3. Listening Comprehension

Communication Skills Lab:
1) Data Analysis (Writing)  ii) Interpretation of visuals

Unit 2

Multimedia Lab:
1. Grammar - Conditionals & Prepositions
2. Vocabulary Lesson 7
3. Listening Comprehension

Communication Skills Lab: Presentation Skills: Oral Presentation

Unit 3

Multimedia Lab:
1. Grammar -- Language Analysis
2. Vocabulary Lesson 8

Communication Skills Lab: Presentation Skills: PPTs

Unit 4

Multimedia Lab:
1. Grammar – Common Errors
2. Writing : Self Introduction (in the Written Form)
3. Vocabulary Lesson 9
4. Listening Comprehension

Communication Skills Lab: Debate

Unit 5

Multimedia Lab:
1. Introduction to Technical Writing
   A. Definition of a Technical Term
   B. Description of a Mechanism
   C. Description of a Technical Process
2. Vocabulary Lesson 10

Communication Skills Lab: Group Discussions
UNIT I

Probability and Distributions: Sample space and events, Probability - The axioms of probability, some elementary theorems, conditional probability, Baye’s theorem. Random variables -discrete and continuous. Distributions - Binomial, Poisson and Normal distributions–related properties.

UNIT II

Sampling Distributions and Testing of Hypothesis: Sampling distributions, sampling distribution of means (σ known and unknown). Point estimation, interval estimation, Tests of hypothesis - null hypothesis, alternate hypothesis, type I, type II errors, critical region. Inferences concerning means and proportions- Large samples-test of hypothesis for single mean and difference between the means. Test of hypothesis for the proportions- single and difference between the proportions, confidence interval for the mean and proportions

UNIT III

Tests of significance- Small samples: Tests of significance-t distributions, confidence interval for the t- distribution, F-distributions and Chi square distributions.

UNIT IV

Correlation and Regression: Coefficient of correlation, regression coefficient, the lines of regression, rank correlation, correlation for bivariate frequency distributions.

UNIT V


TEXT BOOKS

REFERENCES
UNIT I: Diodes, Rectifiers and Filters
Qualitative theory of p-n junction, p-n junction as a diode, diode equation, v-i characteristics, temperature dependence of VI characteristics, static and dynamic resistance levels, p-n diode as a rectifier, half wave and full wave rectifiers, C- filter, Breakdown mechanisms in p-n junction diodes, zener diode characteristics, zener diode as a regulator.

UNIT II: Bipolar Junction Transistor
Junction transistor, Transistor current components, Transistor Construction, BJT operation, BJT symbol, Detailed study of currents in a transistor Input and output characteristics of transistor in Common Base, Common Emitter and Common Collector Configurations, Relation between alpha and beta, transistor as an amplifier, Operating point, Need for biasing.

UNIT III: Field Effect Transistor
The JFET Construction and principal of operation, symbol, Pinch off voltage, Drain and Transfer characteristics, MOSFET principal of operation, symbol, MOSFET Characteristics in Enhancement and Depletion Mode.

UNIT IV: Introduction to Amplifiers
Definition of Voltage gain, Current gain, input resistance and output resistance in Amplifiers.
Concept of feedback, classification of feedback amplifiers, General characteristics of negative feedback amplifiers, Effect of feedback on amplifiers, Introduction to feedback topologies. Barkhausen criteria, principle of operation of LC and crystal oscillators

UNIT V: Special Purpose Electronic Devices
Principle of Operation and Characteristics of UJT, Principle of Operation of SCR, DIAC, TRIAC, Photo Diode, LED and LCD

TEXT BOOKS
REFERENCES


UNIT I
C++ Class Overview, Class Definition, Objects, Class Members, Access Control, Class Scope, Constructors and destructors, parameter passing methods, Inline functions, static class members, this pointer, friend functions, dynamic memory allocation and deallocation (new and delete), exception handling.

UNIT II
Function over Loading, Operator Overloading, Generic Programming- Function and class templates, Inheritance basics, base and derived classes, inheritance types, base class access control, runtime polymorphism using virtual functions, abstract classes, I/O streams.

UNIT III
Review of basic data structures, The list ADT, Stack ADT, Queue ADT, Implementation using template classes in C++. Priority Queues – Definition, ADT, Realizing a Priority Queue using Heaps, Definition, insertion, Deletion, Heap sort,

UNIT IV
Dictionaries, linear list representation, Skip list representation, operations insertion, deletion and searching, hash table representation, hash functions, collision resolution-separate chaining, open addressing-linear probing, quadratic probing, double hashing, rehashing, extendible hashing, comparison of hashing and skip lists. Text Processing – Pattern matching algorithms-Brute Force, Knuth-Morris-Pratt algorithm, Tries – Standard tries, Compressed tries, Suffix tries.

UNIT V

TEXT BOOKS
REFERENCES

2. Data structures using C and C++, Langsam, Augenstein and Tanenbaum, PHI.
UNIT I

UNIT II
Relations: Properties of binary Relations, equivalence, transitive closure, compatibility and partial ordering relations, Hasse diagram. Functions: Inverse Function, Composition of functions, recursive Functions. Algebraic structures: Algebraic systems, Examples and general properties, Semi groups and monoids, groups, and sub groups, Homomorphism, Isomorphism on groups and semi groups.

UNIT III
Elementary Combinatorics: Basics of counting, Combinations & Permutations, with repetitions, Constrained repetitions, Binomial Coefficients, Binomial and Multinomial theorems, the principles of Inclusion – Exclusion, Pigeon hole principles and its application.

UNIT IV
Recurrence Relations: Generating Functions, Function of Sequences, Calculating Coefficients of generating functions, Recurrence relations, Solving recurrence relation by substitution and Generating functions, the method of Characteristic roots, solution of Inhomogeneous Recurrence Relations.

UNIT V
Graph Theory: Representation of Graphs, DFS, BFS, Spanning Trees, Planar Graphs. Graph Theory and Applications: Basic Concepts, Isomorphism and Sub graphs, Multi graphs and Euler circuits, Hamiltonian graphs, Chromatic Numbers.

TEXT BOOKS
REFERENCES
4. Logic and Discrete Mathematics, Grass Man and Tremblay, Pearson Education
VNR Vignana Jyothi Institute of Engineering & Technology

II Year B.Tech CSE, IT – I Sem

<table>
<thead>
<tr>
<th>Course Code</th>
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<tr>
<td>CMS1101</td>
<td>BUSINESS ECONOMICS AND FINANCIAL ANALYSIS</td>
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**UNIT I**  

**UNIT II**  
**Introduction to Business Economics, Demand Analysis:** Definition, Nature and Scope of Managerial Economics- Demand Analysis Determinants, Law of Demand and its exceptions.

**Elasticity of Demand and Demand Forecasting:** Definitions, 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**  
**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.

**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 of scope of capital budgeting, features of capital budgeting proposals, Methods of Capital Budgeting: Payback Method, Accounting Rate of Return(ARR) and Net Present Vale Method (Simple Problems)

**UNIT IV**  
**Theory of production:** Production Function- Isoquants and Isocosts, Least Cost Combination of Inputs, Laws of Returns, Internal and External Economics of Scale.

**Market Structures:** Types of competition, Features of Perfect competition, Monopoly and Monopolistic Competition, Price-Output Determination in case of perfect Competition and Monopoly.

**Pricing Policies and Methods:** Cost plus Pricing, Marginal cost Pricing, Sealed Bid Pricing, Going Rate Pricing, Limit Pricing, Market Skimming Pricing, Penetration Pricing, Two-Part Pricing, Block Pricing, Bundling Pricing, Peak Load Pricing, Cross Subsidization.
UNIT V


Financial Analysis through ratios: Computation, analysis and interpretation of Liquidity Ratios (Current ratio 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 ratio and EPs).

TEXT BOOKS

REFERENCES
UNIT I
NUMBERS SYSTEMS AND CODES: Review of number systems- number base conversion-binary arithmetic- binary weighted and non-weighted codes – Complements-Signed binary numbers-Error Detection and Correcting Codes-Binary Logic.

UNIT II
BOOLEAN ALGEBRA AND GATE LEVEL MINIMIZATION: Postulates and theorems-representation of switching functions-SOP and POS forms –Canonical forms-digital logic gates –Karnaugh Maps –minimization using three variable, four variable and five variable K-Maps, Don’t Care Conditions- NAND and NOR implementation , Other Two-Level Implementation –Exclusive –OR function -Integrated Circuits-Hardware Description Language(HDL)

UNIT III

UNIT IV

UNIT V
TEXT BOOKS

REFERENCES
2. Switching and Logic Design, C.V.S. Rao, Pearson Education
WEEK 1
Implementation of C++ programs using - Constructors, friend functions, Parameter passing methods, this pointer, inline functions, static members, dynamic memory allocation, exception handling.

WEEK 2
Implementation of C++ programs using: Function over Loading, Operator Overloading, Function and class templates, inheritance types, runtime polymorphism using virtual functions, abstract classes, streams I/O.

WEEK 3
Write C++ programs to implement the following using an array
a) Stack ADT        b) Queue ADT        c) Linear list

WEEK 4
Write C++ programs to implement the following using linked list
a) Stack ADT        b) Queue ADT        c) Linear list

WEEK 5
Write C++ programs to implement the following using an array
a) Circular Queue ADT    b) Dequeue ADT

WEEK 6
Write C++ programs to implement the following using linked list
a) Circular Queue ADT    b) Dequeue ADT    c) Double linked list

WEEK 7
Write C++ programs to implement the following on Binary search tree
i) Insertions
ii) deletions
iii) search

WEEK 8
Write C++ programs to implement Binary tree traversals (preorder, inorder, postorder)

WEEK 9
Write C++ programs to implement bfs and dfs for a given graph

WEEK 10
Write C++ programs to implement
a) Heap sort        b) merge sort
WEEK 11
Write C++ programs to implement all functions of dictionary (ADT) using hashing.

WEEK 12
Write C++ programs to implement Brute Force and Knuth –Morris-Pratt pattern matching algorithm
(ECE1252) BASIC ELECTRONICS LABORATORY

Part A: (Only for viva-voce Examination)

**ELECTRONIC WORKSHOP PRACTICE** (in 3 lab sessions):

- Identification, Specification, testing of R,L,C components (color codes), Potentiometers (SPDT, DPDT, and DIP), Coils, Gang Condensers, Relays, Bread Board, PCB’s,
- Identification, Specification, testing of Active devices: Diodes, BJT, Low power JFET’s, MOSFET’s, Power Transistors, LED’s, LCD’s, SCR, UJT.

Study and operation of:
- Multimeters, Function Generator, Regulated Power Supplies, CRO

Part B: (For Laboratory Examination – Minimum of 10 experiments)

1. V-I characteristics of PN junction Diode.
2. Zener diode V-I characteristics
3. Zener diode as voltage regulator.
4. Half Wave rectifier with C-filter
5. Full wave Rectifier with C-filter.
7. Characteristics of CB configuration.
8. FET characteristics.
9. UJT characteristics
10. SCR characteristics
11. CE amplifier
12. LC oscillator
II Year B. Tech CSE, IT - I Sem
(NCC1101) HUMAN VALUES AND PROFESSIONAL ETHICS

Course Description

Objectives
To develop the ability to distinguish between what is of value and what is superficial in life.
To develop the ability to face difficult situations in life boldly and resolve them confidently.
To enable students to progress from discrimination to commitment.
To Encourage the students to understand values in life.

Syllabus
1. Self-confidence
2. Peer Pressure-Irregular life style
3. The Power of Self- determination
4. Human relationship—trust and respect- resolving conflict
5. Anger- A sign of helplessness
6. Interaction and ragging
7. Right Utilization of physical facilities
8. Unhappiness - Unfulfilled expectations
9. Setting goals- long term and short term goals-handling responsibilities
10. Dealing with people while coordinating work
11. Coping with stress-Identifying one’s interests and strengths
12. Time Management-Planning and aligning with one’s goals
13. Skills and Values
14. The role of values in Society

Course Book
The resource material that has been prepared by IIIT can be used apart from material that is available in the websites. Later text books can be identified for the facility of the students.

Evaluation
This course would only have a pass/ fail grade. Participation in discussions, submission of assignments and weekly reports and a final report will be used in evaluation.

Outcome
At the end of the course the students would become sensitive towards human values. They would understand commitment and responsibility. They would be able to bring harmony in the society they live.
TEXT BOOKS

REFERENCES
UNIT-I
Fundamentals: strings, Alphabet, Language, Operations, Chomsky hierarchy of languages, Finite state machine Definitions, finite automation model, acceptance of strings and languages, DFA and NFA, transition diagrams and language recognizers. NFA with ε transitions –Equivalence between NFA with and without ε transitions, NFA to DFA conversion, minimization FSM, equivalence between two FSM’s, Output machines- Moore and Mealy machine.

UNIT –II
Regular Languages : Regular Sets , Regular Expressions , identity Rules, Constructing Finite automata for a given regular expressions, Conversion of Finite automata to regular expressions, Pumping lemma of regular sets , closure properties of regular sets (proofs not required). Regular Grammars – right linear and left linear grammars, equivalence between regular grammar and FA,

UNIT –III
Push Down Automata- definition, model, acceptance of CFL, Acceptance by final state and acceptance by empty state and its equivalence, Equivalence of CFL and PDA (proofs not required), Introduction to DCFL and DPDA.

UNIT –IV
Turing Machine: Definition, model, Design of TM, computable functions, recursively enumerable languages. Church’s hypothesis, counter machine, types of Turing Machines (proofs not required)

UNIT –V
Computability Theory: Linear Bounded Automata and context sensitive languages, LR (0) grammar, decidability of problems, Universal TM, Un decidable problems about Turing Machine – Post’s Correspondence Problem - The classes P and NP.

TEXT BOOKS
REFERENCES

UNIT I

UNIT II
Syntax and Semantics: General Problem of describing syntax and semantics, formal methods of describing syntax---BNF, EBNF for common programming languages features, parse trees, ambiguous grammars, attribute grammars, denotational semantics and axiomatic semantics for common programming language features.

UNIT III
Data types: Primitive, character, user defined, array, associative, record, union, pointer and reference types, design and implementation uses related to these types. Names, Variable, concept of binding, type checking, strong typing, type compatibility, named constants, variable initialization.

Expressions and Statements: Arithmetic, Relational and Boolean expressions, Short circuit evaluation, mixed mode assignment, Assignment statements, Control Structures --- Statement level, Compound Statements, Selection, Iteration, Unconditional Statements, guarded commands.

UNIT IV
Subprograms and Blocks: Fundamentals of sub-programs, Scope and lifetime of variable, static and dynamic scope, Local referencing environments, parameter passing methods, overloaded sub-programs, generic sub-programs. Abstract Data types: Introduction to data abstraction, encapsulation, and design issues, C++ parameterized ADT, object oriented programming in C++, Java. Concurrency---Subprogram level concurrency, semaphores, monitors, message passing, and Java threads.

UNIT V
Exception handling: Exceptions, Exception propagation, Exception handler in C++ and Java.

Logic Programming Language: Introduction and overview of logic programming, applications of logic programming.
**Functional Programming Language**: Introduction and fundamentals of FPL, LISP, ML, Haskell, applications of FPL and comparison of functional and imperative languages.

**TEXT BOOKS**

**REFERENCES**
1. Programming languages – Ghezzi, 3/e, John Wiley
3. Programming Languages – Watt, Wiley Dreamtech
4. LISP Patric Henry Winston and Paul Horn Pearson Education.
UNIT I
BASIC STRUCTURE OF COMPUTERS: Computer types, functional unit, basic operational concepts, bus structures, multi processors and multi computers, multi tasking. Register Transfer Language and Micro operations: Register Transfer language, Regiser Transfer, Arithmetic Micro operations, Logic Micro operations, Shift Micro operations, Arithmetic logic shift unit.

UNIT II
BASIC COMPUTER ORGANIZATION AND DESIGN: Instruction Codes, Computer Registers, computer instructions – instruction Cycle, memory reference instructions, input-output and interrupt. Central Processing Unit: Stack organization, instruction formats, addressing modes, data transfer and manipulation, program control, CISC and RISC.

UNIT III
MICROPROGRAMMED CONTROL: Control memory, address sequencing, micro program example, design of control unit, hardwired control, micro programmed control. THE MEMORY ORGANIZATION: Memory hierarchy, Main Memory, Cache memory, performance considerations, virtual memory, secondary storage.

UNIT IV
COMPUTER ARITHMETIC: Addition and subtraction, multiplication algorithms, Division algorithms, floating-point arithmetic operations, Decimal arithmetic unit, Decimal arithmetic operations. INPUT-OUTPUT ORGANIZATION: Peripheral devices, input-output interface, asynchronous data transfer, modes of transfer, priority interrupt, direct memory access.

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

TEXT BOOKS
REFERENCES

2. Fundamentals of Computer Organization and Design, Sivarama Dandamudi
   BS Publication
UNIT I
Introduction: Algorithm, Psuedo code for expressing algorithms, Performance Analysis-Space complexity, Time complexity, Asymptotic Notation- Big oh notation, Omega notation, Theta notation. Disjoint Sets- disjoint set operations, union and find algorithms, spanning trees, connected components and biconnected components.

UNIT II
Divide and conquer: General method , applications-Binary search, Quick sort, Merge sort, Strassen's matrix multiplication.
Greedy method: General method, applications-Job sequencing with dead lines, 0/1 knapsack problem, Minimum cost spanning trees, Single source shortest path problem, Huffman Codes.

UNIT III
Dynamic Programming: General method, applications-Principle of Optimality,Multistage graphs, Matrix chain multiplication, Optimal binary search trees, 0/1 knapsack problem, All pairs shortest path problem, Travelling sales person problem, Reliability design.

UNIT IV
Backtracking: General method, applications- Recursive Permutation Selector,N-queen problem, sum of subsets problem, Graph coloring, Hamiltonian cycles.

UNIT V
Branch and Bound: General method, applications - Travelling sales person problem,0/1 knapsack problem- LC Branch and Bound solution, FIFO Branch and Bound solution. NP-Hard and NP-Complete problems: Basic concepts, non deterministic algorithms, NP - Hard and NP Complete classes, Cook’s theorem.

TEXT BOOKS
REFERENCES

1. Algorithm Design: Foundations, Analysis and Internet examples
   M.T.Goodrich and R.Tomassia, John wiley and sons.
2. Introduction to Design and Analysis of Algorithms A strategic approach
UNIT I
Introduction to Databases and Database Management System - Database system Applications - Advantages of DBMS over File System - Data Models – Instances and schema - View of Data - Database Languages -DDL-DML - Database Users and Administrator - Database System Structure.

UNIT II

UNIT III
Introduction to the Relational Model – Structure of RDBMS - Integrity Constraints over Relations – Enforcing Integrity Constraints – Querying Relational Data - Relational Algebra and Calculus.
Introduction to SQL- Data Definition commands, Data Manipulation Commands, Basic Structure, Set operations Aggregate Operations - Join operations - Sub queries and correlated queries, SQL functions , views ,Triggers, Embedded SQL.

UNIT IV

UNIT V
Transaction concept- Transaction state- Implementation of atomicity and Durability-Concurrent executions – Serializability, Recoverability
TEXTBOOKS
1. Database System Concepts, Silberschatz, Korth, Fifth Edition, McGraw hill (1,2,3,5 Units)
2. Database Management Systems, Raghuramakrishnan, Johannes Gehrke, TATA Mc Graw Hill - (1,2,3,5 Units)
3. Introduction to Database Systems, C.J.Date, Pearson Education (4th Unit)
REFERENCES
1. Fundamentals of Database Systems, Elmasri Navrate Pearson Education
UNIT I
Introduction to Java
Introduction: Creation of Java, Java buzzwords, OOP Principles, Encapsulation, Inheritance and Polymorphism, Classes and Objects: Creating and usage objects, introducing methods, constructors, usage of static with data and methods, usage of final with data, access control, this key word, garbage collection, overloading methods and constructors, parameter passing, recursion, nested classes and inner classes, String Handling

UNIT II
Inheritance, Packages and Interfaces
Basic concepts, member access rules, usage of super key word, forms of inheritance, method overriding, abstract classes, dynamic method dispatch, using final with inheritance, the Object class. Defining, Creating and Accessing a Package, Understanding CLASSPATH, importing packages, differences between classes and interfaces, defining an interface, implementing interface, applying interfaces, variables in interface and extending interfaces.

UNIT III
Exception Handling and Multithreading
Concepts of Exception handling, types of exceptions, usage of try, catch, throw, throws and finally keywords, Built-in exceptions, creating own exception sub classes, Concepts of Multithreading, differences between process and thread, thread life cycle, creating multiple threads using Thread class, Runnable interface, Synchronization, thread priorities, inter thread communication, daemon threads, deadlocks, thread groups.

UNIT IV
Event Handling, AWT Controls
Events, Event sources, Event classes, Event Listeners, Delegation event model, handling mouse and keyboard events, Adapter classes.
AWT : Concepts of components, container, panel, window, frame, canvas, Font class, Color class and Graphics, AWT Controls. Applets - Concepts of Applets, differences between applets and applications, life cycle of an applet, types of applets, creating applets, passing parameters to applets.
UNIT-V
Networking, Java Library, JDBC
Networking: Inetaddress, TCP/IP sockets, Datagrams, URL, URL connection, String handling, java.util, java.io and java.net packages.
JDBC: Different type of Drivers, Connection establishment, Retrieving and manipulation data from client and storing in data base. Java Library: explore io, util, net, lang, sql, awt packages. Introduction to Java APIs: what is API, discuss APIs in Java SS, Java EE, Java ME

TEXT BOOKS

REFERENCES
5. Java, Somasundaram, Jaico.
Objective: This lab enables the students to practice the concepts learnt in the subject DBMS by developing a database for an example company named "Roadway Travels" whose description is as follows. The student is expected to practice the designing, developing and querying a database in the context of example database "Roadway travels". Students are expected to use "Oracle" database.

Roadway Travels "Roadway Travels" is in business since 1997 with several buses connecting different places in India. Its main office is located in Hyderabad.

The company wants to computerize its operations in the following areas:

- Reservations and Ticketing
- Cancellations

Reservations & Cancellation:

Reservations are directly handled by booking office. Reservations can be made 30 days in advance and tickets issued to passenger. One Passenger/person can book many tickets (to his/her family).

Cancellations are also directly handed at the booking office.

In the process of computerization of Roadway Travels you have to design and develop a Database which consists the data of Buses, Passengers, Tickets, and Reservation and cancellation details. You should also develop query’s using SQL to retrieve the data from the database.

The above process involves many steps like

1. Analyzing the problem and identifying the Entities and Relationships
2. E-R Model
3. Relational Model
4. Normalization
5. Creating the database
6. Querying.

Students are supposed to work on these steps week wise and finally create a complete "Database System" to Roadway Travels. Examples are given at every experiment for guidance to students.

Experiment 1: E-R Model

Analyze the problem carefully and come up with the entities in it. Identify what data has to be persisted in the database. This contains the entities, attributes etc. Identify the primary keys for all the entities. Identify the other keys like candidate keys, partial keys, if any.
Note: The student is required to submit a document by writing the Entities and Keys to the lab teacher.

**Experiment 2: Concept design with E-R Model**
Relate the entities appropriately. Apply cardinalities for each relationship. Identify strong entities and weak entities (if any). Indicate the type of relationships (total / partial). Try to incorporate generalization, aggregation, specialization etc wherever required.

Note: The student is required to submit a document by drawing the E-R Diagram to the lab teacher.

**Experiment 3: Relational Model**
Represent all the entities (Strong, Weak) in tabular fashion. Represent relationships in a tabular fashion. There are different ways of representing relationships as tables based on the cardinality. Represent attributes as columns in tables or as tables based on the requirement. Different types of attributes (Composite, Multi-valued, and Derived) have different way of representation.

Note: The student is required to submit a document by Represent relationships in a tabular fashion to the lab teacher.

**Experiment 4: Normalization**
Database normalization is a technique for designing relational database tables to minimize duplication of information and, in so doing, to safeguard the database against certain types of logical or structural problems, namely data anomalies. For example, when multiple instances of a given piece of information occur in a table, the possibility exists that these instances will not be kept consistent when the data within the table is updated, leading to a loss of data integrity. A table that is sufficiently normalized is less vulnerable to problems of this kind, because its structure reflects the basic assumptions for when multiple instances of the same information should be represented by a single instance only.

**Experiment 5: Practicing DDL and DML commands**
Create all the normalized tables that are identified in Experiment 4. Insert data into the above tables.

**Experiment 6: Querying**
In this week you are going to practice queries (along with sub queries) using ANY, ALL, IN, Exists, NOT EXISTS, UNION, INTERSECT, Constraints etc.

Practice the following Queries:
1. Display unique PNR, no of all passengers.
2. Display all the names of male passengers.
3. Display the ticket numbers and names of all the passengers.
4. Find the ticket numbers of the passengers whose name start with V and ends with 'h'.
5. Find the names of passengers whose age is between 30 and 45.
6. Display all the passengers names beginning with 'A'
7. Display the sorted list of passengers names.
Experiment 7 Querying (continued...)
You are going to practice queries using Aggregate functions (COUNT, SUM, AVG, and MAX and MIN), GROUP BY, HAVING and Creation and dropping of Views.

8. Write a Query to display the Information present in the Passenger and cancellation tables. Hint: Use UNION Operator.
9. Display the number of days in a week on which the 9WO1 bus is available.
10. Find number of tickets booked for each PNR_no using GROUP BY CLAUSE. Hint: Use GROUP BY on PNR_No.
11. Find the distinct PNR numbers that are present.
12. Find the number of tickets booked by a passenger where the number of seats is greater than 1. Hint: Use GROUP BY, WHERE and HAVING CLAUSES.
13. Find the total number of cancelled seats.
14. Display the details of passengers who travelled within the last 3 months.
15. Create a view for the details of passengers who cancelled their tickets.

Experiment 8: Create tables for the following schema.
Student(snum: integer, sname: string, major: string, level: string, age: integer)
Class(name: string, meets at: time, room: string, fid: integer)
Enrolled(snum: integer, cname: string)
Faculty(fid: integer, fname: string, deptid: integer)

Experiment 09: Querying
1. Find the names of all Juniors (Level = JR) who are enrolled in a class taught by I. Teach.
2. Find the age of the oldest student who is either a History major or is enrolled in a course taught by Teacher
3. Find the names of all classes that either meet in room R128 or have 5 or more students enrolled.
4. Find the names of all students who are enrolled in two classes that meet at the same time.
5. Find the names of faculty members who teach in every room in which some class is taught.
6. Find the names of faculty members for whom the combined enrollment of the courses that they teach is less than 5
7. Print the Level and the average age of students for that Level, for each Level.
8. Print the Level and the average age of students for that Level, for all Levels except JR.
9. Print the Level and the average age of students for that Level, whose average age is greater than 20.
10. Find the names of students who are enrolled in the maximum number of classes.
11. Find the names of students who are not enrolled in any class.
12. Count the number of junior level students.
13. Display all the students whose names start with the letter “p”.
14. Display all the teachers whose names contain letter ‘a’ or ‘I’ in their names.

**Experiment 10: PL/SQL Programs**

1. Program to find sum of first ‘n’ natural no.s
2. Program to find reverse of a number
3. Insert the values of areas of a circle into a table called areas taking radius values from 2 to 8.

**Experiment 11: Cursors**

In this week you need to do the following: Declare a cursor that defines a result set. Open the cursor to establish the result set. Fetch the data into local variables as needed from the cursor, one row at a time. Close the cursor when done. Practice the following programs using cursors.

1. Write a cursor program to retrieve the details of all students using cursors (Use students table in experiment 9)
2. Write a PL/SQL block to update the level of students from JL to “junior Level” and SL to “senior Level” and insert a record in newlevel table.
3. Write a cursor program to display the details of Senior Level students.

**Experiment 12: Procedures**

In this session you are going to learn Creation of stored procedure, Execution of procedure and modification of procedure. Practice procedures using the above database.

**Experiment 13: Triggers**

In this week you are going to work on Triggers. Creation of insert trigger, delete trigger, update trigger. Practice triggers using the above database.

**REFERENCES**

1. Introduction to SQL, Rick F. Vander Lans, Pearson Education.
2. Oracle PL/SQL, B. Rosenzweig and E. Silvestrova, Pearson Education.
3. Oracle PL/SQL Programming, Steven Feuerstein, SPD.
4. SQL & PL/SQL for Oracle 10g, Black Book, Dr. P.S. Deshpande, Dream Tech.
5. Oracle Database 11g PL/SQL Programming, M. Me Laughlin, TMH.
6. SQL Fundamentals, J. Patrick, Pearson Education.
II Year B.Tech CSE, IT – II Sem

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0 3 2

(ITD1204) OBJECT ORIENTED PROGRAMMING through JAVA LABORATORY

Objectives:
1. To make the student learn a object oriented way of solving problems.
2. To teach the student to write programs in Java to solve the problems

Recommended Systems/Software Requirements:
(1) Intel based desktop PC with minimum of 166 MHZ or faster processor with atleast 64 MB RAM and 100MB free disk space
(2) JDK Kit. Recommended

Week 1
a) Write a Java program that prints all real solutions to the quadratic equation ax^2 + bx +c = 0.
Read in a, b, c and use the quadratic formula. If the discriminant b^2 -4ac is negative, display a
message stating that there are no real solutions.
b) The Fibonacci sequence is defined by the following rule:
The fist two values in the sequence are 1 and 1. Every subsequent value is the sum of
the two values preceding it. Write a Java program that uses both recursive and non
recursive functions to print the nth value in the Fibonacci sequence.

Week 2
a) Write a Java program that prompts the user for an integer and then prints out all
prime numbers up tothat. integer.
b) Write a Java program to multiply two given matrices.
c) Write a Java Program that reads a line of integers, and then displays each integer,
and the sum of all the integers (Use Stringtokenizer class of java.util)

Week 3
a) Write a Java program that checks whether a given string is a palindrome or not.
Ex: MADAM is a palindrome.
b) Write a Java program for sorting a given list of names in ascending order.
c) Write a Java program to make frequency count of words in a given text.

Week 4
a) Write a Java program that reads a file name from the user, then displays information
about whether the file exists, whether the file is readable, whether the file is writable,
the type of file andthe length of the file in bytes.
b) Write a Java program that reads a file and displays the file on the screen, with a line
number before each line.
c) Write a Java program that displays the number of characters, lines and words in a
text file.

Week 5
a) Write a Java program that:
i) Implements stack ADT. ii) Converts infix expression into Postfix form iii) Evaluates the postfix expression

Week 6
a) Develop an applet that displays a simple message.
b) Develop an applet that receives an integer in one text field, and computes its factorial value and returns it in another text field, when the button named “Compute” is clicked.

Week 7
a) Write a Java program that works as a simple calculator. Use a grid layout to arrange buttons for the digits and for the +, -, *, % operations. Add a text field to display the result.

Week 8
a) Write a Java program for handling mouse events.

Week 9
a) Write a Java program that creates three threads. First thread displays “Good Morning” every one second, the second thread displays “Hello” every two seconds and the third thread displays “Welcome” every three seconds.
b) Write a Java program that correctly implements producer consumer problem using the concept of interthread communication.

Week 10
a) Write a program that creates a user interface to perform integer divisions. The user enters two numbers in the text fields, Num1 and Num2. The division of Num1 and Num2 is displayed in the Result field when the Divide button is clicked. If Num1 or Num2 were not an integer, the program would throw a NumberFormatException. If Num2 were Zero, the program would throw an ArithmeticException Display the exception in a message dialog box.

Week 11
a) Write a Java program that implements a simple client/server application. The client sends data to a server. The server receives the data, uses it to produce a result, and then sends the result back to the client. The client displays the result on the console. For ex: The data sent from the client is the radius of a circle, and the result produced by the server is the area of the circle. (Use java.net)

Week 12
a) Write a java program that simulates a traffic light. The program lets the user select one of three lights: red, yellow, or green. When a radio button is selected, the light is turned on, and only one light can be on at a time. No light is on when the program starts.
b) Write a Java program that allows the user to draw lines, rectangles and ovals.
Week 13
a) Write a java program to create an abstract class named Shape that contains an empty method named numberOfSides(). Provide three classes named Trapezoid, Triangle and Hexagon such that each one of the classes extends the class Shape. Each one of the classes contains only the method numberOfSides() that shows the number of sides in the given geometrical figures.
b) Suppose that a table named Table.txt is stored in a text file. The first line in the file is the header, and the remaining lines correspond to rows in the table. The elements are separated by commas. Write a java program to display the table using JTable component.

Week 14
a) Write a java program to establish connection to a database and perform DML operations over the database.
b) Design a form which will submit data to a database.
c) Create a Form to receive data from database

Week 15
a) Write a java program to make use of APIs

TEXT BOOKS:
2. Introduction to Java programming, Sixth edition, Y.Daniel Liang, Pearson Education
UNIT I
Introduction to Software Engineering: Changing nature of Software, Software Myths.
A Generic View Of Process: Software engineering-A layered technology, The Capability Maturity Model Integration (CMMI)
Process Models: The water fall model, Incremental process models, evolutionary process models, the unified process.

UNIT II
Software Requirements: Functional and non functional requirements, User requirements, System requirements, Interface specification, The software requirements document.
Requirements Engineering Process:
Feasibility studies, requirements elicitation and analysis, requirements validation, requirements management

UNIT III
System models: context models, behavior models, data models, object models, structured methods
Design engineering: design process and design quality, design concepts the design model
Creating an architectural design: software architecture, data design, architectural styles and patterns, architectural design

UNIT IV
Test Strategies: A strategic approach to software testing
Black box and White box Testing, Validation Testing, System Testing,
Product Metrics ,Software Quality, Metrics for analysis model, Metrics for design model, Metrics for source code, Metrics for testing, Metrics for maintenance Metrics for process and products, Software measurement, Metrics for software quality

UNIT V
Risk Management: Reactive vs proactive risk strategies, Software risks, Risk identification, Risk projection Risk refinement, RMMM, RMMM plan
Quality Management, Quality concepts, Software quality assurance, Software reviews, Formal technical reviews, Statistical Software Quality Assurance, Software reliability, ISO 9000 Quality standards
TEXT BOOKS


REFERENCES

UNIT I
Introduction to 8085 Microprocessor, Architecture of 8086 Microprocessor, Addressing modes of 8086, Instruction set of 8086, Assembler directives, simple assembly language programs, procedures, and macros. Pin diagram of 8086-Minimum mode and maximum mode of operation.

UNIT II
Memory and I/O organization of 8086, 8255 PPI – various modes of operation and interfacing to 8086, D/A and A/D converter to 8086 using 8255, memory interfacing to 8086.

UNIT III

UNIT IV

Timer, serial port and Interrupts programming: Programming 8051 timers/counters, 8051 serial port programming, programming timer interrupts, programming External hardware interrupts, programming serial communication interrupts.

UNIT V
Interfacing to 8051: A/D and D/A Converter, Stepper Motor Interface, Key Board Interfacing, LCD Interfacing.

ARM Processor: Fundamentals, Registers, current program status register, pipeline, Exceptions, Interrupt and the vector table.

TEXT BOOKS
REFERENCES
UNIT I


UNIT II
Data link layer: Introduction, framing, Error – detection and correction – Parity – LRC – CRC – Hamming code, flow and error control, Noiseless channels, noisy channels, HDLC, point to point protocols. LAN - Ethernet IEEE 802.3 - IEEE 802.4 - IEEE 802.5 - IEEE 802.11

Medium Access sub layer: Random access, Controlled access, Channalization

UNIT III
Network layer: Logical addressing, internetworking, tunneling, address mapping, ICMP, IGMP, forwarding, Uni-cast routing protocols, multicast routing protocols.

UNIT IV
Transport Layer: Process to process delivery, UDP and TCP protocols, SCTP, Data traffic, congestion, congestion control, Qos, integrated services, differentiated services, QoS in switched networks.

UNIT-V
Application Layer: Domain name space, DNS in internet, electronic mail, SMTP, FTP, WWW, HTTP, SNMP, network security, Cryptography.

TEXT BOOKS
REFERENCES
1. Data communications and computer Networks, P.C .Gupta, PHI.
UNIT–I
**Overview of Compilation:** Phases of Compilation – Lexical Analysis, Regular Grammar and regular expression for common programming language features, pass and Phases of translation, interpretation, bootstrapping, data structures in compilation – LEX lexical analyzer generator.

UNIT–II
**Top down Parsing:** Context free grammars, Top down parsing – Backtracking, LL (1), recursive descent parsing, Predictive parsing, Preprocessing steps required for predictive parsing. Bottom up parsing: Shift Reduce parsing, LR and LALR parsing, Error recovery in parsing, handling ambiguous grammar, YACC – automatic parser generator.

UNIT–III
**Semantic analysis:** Intermediate forms of source Programs – abstract syntax tree, polish notation and three address codes. Attributed grammars, Syntax directed translation, Conversion of popular Programming languages language Constructs into Intermediate code forms, Type checker. Symbol Tables: Symbol table format, organization for block structures languages, hashing, tree structures representation of scope information. Block structures and non block structure storage allocation: static, Runtime stack and heap storage allocation, storage allocation for arrays, strings and records.

UNIT–IV
**Code optimization:** Consideration for Optimization, Scope of Optimization, local optimization, loop optimization, frequency reduction, folding, DAG representation. Data flow analysis: Flow graph, data flow equation, global optimization, redundant sub expression elimination, Induction variable elements, Live variable analysis, Copy propagation.

UNIT–V
**Object code generation:** Object code forms, machine dependent code optimization, register allocation and assignment generic code generation algorithms, DAG for register allocation.
TEXTBOOKS

REFERENCES
1. lex & yacc – John R. Levine, Tony Mason, Doug Brown, O’reilly
UNIT I
Computer System and Operating System Overview: Overview of computer operating systems, operating systems functions, protection and security, distributed systems, special purpose systems, operating systems structures, and systems calls, operating systems generation.

UNIT II:
Concurrency: Process synchronization, the critical section problem, Peterson's Solution, synchronization Hardware, semaphores, classic problems of synchronization, monitors, Synchronization examples, atomic transactions.
Memory Management: Swapping, contiguous memory allocation, paging, structure of the page table, segmentation, virtual memory, demand paging, page Replacement, algorithms.

UNIT III:

UNIT IV:

UNIT V:
TEXT BOOKS :

REFERENCES :
2. Operating System A Design Approach-Crowley, TMH.
OBJECTIVE

- To understand the functionalities of various layers of OSI model.
- To understand the operating system functionalities System/Software Requirement.
- Intel based desktop PCs LAN CONNECTED with minimum of 166 MHZ or faster processor with at least 64 MB RAM and 100 MB free disk space.

COMPUTER NETWORKS LAB

1. Implement the data link layer framing methods such as character, character stuffing and bit stuffing.
2. Implement on a data set of characters the three CRC polynomials – CRC 12, CRC 16 and CRC CCIP.
3. Implement Dijkstra’s algorithm to compute the Shortest path thru a graph.
4. Take an example subnet graph with weights indicating delay between nodes. Now obtain Routing table at each node using distance vector routing algorithm.
5. Take a 64 bit plain text and encrypt the same using DES algorithm.
6. Using RSA algorithm encrypt a text data and Decrypt the same.

OPERATING SYSTEMS LAB

7. Simulate the following CPU scheduling algorithms
   a) Round Robin b) SJF c) FCFS d) Priority
8. Simulate all file allocation strategies
   a) Sequential b) Indexed c) Linked
9. Simulate MVT and MFT
10. Simulate all File Organization Techniques
    a) Single level directory b) Two level c) Hierarchical d) DAG
11. Simulate Bankers Algorithm for Dead Lock Avoidance
12. Simulate Bankers Algorithm for Dead Lock Prevention
13. Simulate all page replacement algorithms
(ECE1206) MICROPROCESSORS AND MICROCONTROLLERS LABORATORY

1. Programs for 16 bit arithmetic operations for 8086 (using Various Addressing Modes).
2. Program for sorting an array for 8086.
3. Program for searching for a number or character in a string for 8086.
4. Program for string manipulations for 8086.
5. Program for digital clock design using 8086.
6. Interfacing ADC and DAC to 8086 / 8051.
7. Interfacing stepper motor to 8086 / 8051.
8. Programming using arithmetic, logical and bit manipulation instructions of 8051.
9. Program and verify Timer/ Counter in 8051.
10. Program and verify Interrupt handling in 8051.
11. UART Operation in 8051.
12. Communication between 8051 kit and PC.
13. Interfacing LCD to 8051.
Introduction
This course aims to offer students a practical approach to Technical Writing, and provide a relevant, contemporary and authoritative introduction to the dynamic field of technical communication that prepares them for Workplace Communication. Each unit in the syllabus is devised so as to include a writing component as well as an oral component.

**The objectives of this course are to**

i) expose students to workplace writing
ii) initiate them into the Process of Technical Communication
iii) enable the students to create clear, accurate, and succinct content
iv) enable students to produce documents reflecting different types of technical communication such as Abstracts, Proposals and Technical Reports through ample practice
v) enable students to adjust technical content to meet the needs of a specific target audience
vi) groom students in behavioral skills

**Methodology**

**Written Communication Component**
A Process- Genre methodology will be used in teaching the technical genres. This method would enable students to understand the use of particular lexico-grammatical patterns required of in the context of technical writing. They would learn to use language to express the particular communicative intent that is required of in the context of writing these genres.

**Objectives of Writing Component**

i) enable students to write clearly and succinctly
ii) equip students with the ability to write technical genres

**Oral Communication Component**
The objective of including Oral Communication is to impart behavioral skills and prepare students to speak to a large group or team, keeping in mind the audience, context and purpose of communication. This Oral Communication component must enable students to speak in an organized and mature way, without any inhibitions. They will be groomed to relate their speech to their audience.

**Objectives of Oral Communication Component**

i) equip students with Behavioral skills
ii) prepare them for Oral presentations, and Group Discussions
iii) equip them with Interview skills
Syllabus Outline

Unit I

Writing Skills 1

1. Applications and Covering letters
2. Resume Writing
3. Verbal Ability
4. Oral Communication: Talking About Yourself

Unit II

1. Writing an SOP
2. Summarizing and Synthesizing Information
3. Oral Communication: Making Presentations

Unit III

1. Writing Project Proposals
2. Oral Communication: Group Discussions

Unit IV

1. Writing Project Reports
2. Oral Communication: Interview Skills

Unit V.

Behavioral Skills and Personality Development

1. Building a Positive Attitude, Building a Positive Personality, Motivation, Goal Setting & Values & Vision
2. Problem Solving and Decision Making; Negotiation Skills through Role Play
3. Team Building and Leadership Abilities
4. Social Etiquette

REQUIRED TEXT AND MATERIALS


References

UNIT I
Introduction: Purpose of testing-Dichotomies-Software Testing Principles- Bugs, consequences of bugs, Taxonomy of bugs -The Tester's Role in a Software Development Organization-Black box testing and white box testing- Defects -Cost of defects- Defect Classes- Defect Examples ,software testing life cycle.

UNIT II
Flow graphs and Path testing: Basics concepts of path testing-predicates-path predicates and achievable paths- path sensitizing- path instrumentation, application of path testing.
Transaction Flow Testing: Transaction flows- transaction flow testing techniques-
Dataflow testing: Basics of dataflow testing - strategies in data flow testing – application of data flow testing.

UNIT III
Alpha , Beta Tests – Usability and Accessibility testing – Configuration testing - Compatibility testing – Testing the documentation .

UNIT IV
Paths, Path products and Regular expressions: Path products & path expression-reduction procedure- applications- regular expressions & flow anomaly detection.
Logic Based Testing: Overview decision tables-path expressions, k-v charts- State-State Graphs and Transition testing: State graphs- good & bad stategraphs-state testing
State, state graphs and transition testing: state graphs ,good and bad state graphs ,state testing, testability tips

UNIT V
Graph Matrices and applications: motivational over view ,matrix of graph, relations ,power of matrix, node reduction algorithm .
TEXT BOOKS

REFERENCES
UNIT I
Introduction: Fundamentals of data mining, KDD process, Data Mining Functionalities, Classification of Data Mining systems, Data Mining Task primitives, Integration of a Data mining System with a Database or a Data warehouse systems, Major issues in Data Mining.
Data Preprocessing: Needs for Preprocessing the Data, Data Cleaning, Data Integration and Transformation, Data Reduction, Discretization and Concept Hierarchy Generation.

UNIT II
Data Warehouse and OLAP Technology for Data Mining: Data Warehouse, Multidimensional Data Model, Data Warehouse Architecture, Data Warehouse Implementation, From Data Warehousing to Data Mining.

UNIT III
Mining Frequent, Associations and Correlations: Basic Concepts, Frequent Itemset mining methods, Mining Multilevel Association Rules from Transaction Databases, Mining Multidimensional Association Rules from Relational Databases and Data Warehouses, From Association Mining to Correlation Analysis, Constraint-Based Association Mining.

UNIT IV
Classification and Prediction: Issues Regarding Classification and Prediction, Classification by Decision Tree Induction, Bayesian Classification, Classification by Backpropagation, Classification Based on Concepts from Association Rule Mining, Other Classification Methods, Prediction, Classifier Accuracy.

UNIT V
Cluster Analysis Introduction: Types of Data in Cluster Analysis, A Categorization of Major Clustering Methods, Partitioning Methods, Density-Based Methods, Grid-Based Methods, Model-Based Clustering Methods, Outlier Analysis.
Mining Complex Types of Data: Mining Spatial Databases, Mining Multimedia Databases, Mining Time-Series and Sequence Data, Mining Text Databases, Mining the World Wide Web.
TEXT BOOKS

REFERENCES
1. Introduction to data mining, Pang-Ning Tan, Michael Steinbach, Vipin Kumar, Addison-Wesley, 2005.
2. Data Mining Introductory and Advanced topics – MARGARET H DUNHAM, PEARSON EDUCATION
3. Lecture Notes on Data Mining, Micheal W.Berry, Murray Browne, World Scientific Publishing Co
6. The Data Warehouse Life cycle Tool kit – RALPH KIMBALL WILEY STUDENT EDITION.
UNIT I
Linux Utilities: File handling utilities, Security by file permissions, Process utilities, Disk utilities, Networking commands, Filters, Text processing utilities and Backup utilities, sed – scripts, operation, addresses, commands, applications, awk – execution, fields and records, scripts, operation, patterns, actions, functions, using system commands in awk.

UNIT II
Working with the Bourne again shell(bash): Introduction, shell responsibilities, pipes and input Redirection, output redirection, here documents, running a shell script, the shell as a programming language, shell meta characters, file name substitution, shell variables, command substitution, shell commands, the environment, quoting, test command, control structures, arithmetic in shell, shell script examples, interrupt processing, functions, debugging shell scripts.

UNIT III
Linux Files: File Concept, File System Structure, Inodes, File types, The standard I/O (fopen, fclose, fflush, fseek, fgetc, getc, getchar, fprintf, printf, putchar, puts, gets etc.), formatted I/O, stream errors, kernel support for files, System calls, library functions, file descriptors, low level file access - usage of open, creat, read, write, close, lseek, stat family, umask, dup, dup2, fcntl, file and record locking. file and directory management - chmod, chown, links(soft links & hard links - unlink, link, symlink), mkdir, rmdir, chdir, getcwd, Scanning Directories-opendir, readdir, closedir, rewinddir, seekdir, telldir functions.

UNIT IV
Linux Signals – Introduction to signals, Signal generation and handling, Kernel support for signals, Signal function, unreliable signals, reliable signals, kill, raise, alarm, pause, abort, sleep functions.
UNIT V
Interprocess Communication: Introduction to IPC, FIFOs, client/server example. Semaphores-Kernel support for semaphores, Linux APIs for semaphores, file locking with semaphores.

Shared Memory: Kernel support for shared memory, Linux APIs for shared memory, semaphore and shared memory example.

Sockets: Introduction to Linux Sockets, Socket system calls for connection oriented protocol and connectionless protocol, example-client/server programs.

TEXT BOOKS:
1. Unix System Programming using C++, T.Chan, PHI.

REFERENCES:
2. Unix Network Programming, W.R.Stevens, PHI.
III Year B.Tech IT- II Sem

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(ECE1156) DATA COMMUNICATIONS SYSTEMS

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, Data communications Networks, Alternate Protocol Suites.


UNIT II


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.

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

THE TELEPHONE CIRCUIT:
The Local Subscriber Loop, Transmission Parameters and Private line circuits, Voice-Frequency Circuit Arrangements, Noise and Crosstalk.


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


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

REFERENCES
1. Data Communications and Networking, Behrouz A Forouzan, Fourth Edition. TMH.
UNIT I
Introduction to UML: Importance of modeling, principles of modeling, object oriented modeling, conceptual model of the UML, Architecture, Software Development Life Cycle.

UNIT II
Basic Structural Modeling: Classes, Relationships, Common mechanisms and diagrams.
Advanced Structural Modeling: Advanced classes, advanced relationships, Interfaces, Types and Roles, Packages, Common modeling techniques.

UNIT III
Class and Object Diagrams: Terms, concepts, modeling techniques for class and object diagrams, Common modeling techniques.

Basic Behavioral Modeling-I: Interactions, Interaction diagrams, Common modeling techniques

UNIT IV
Basic Behavioral Modeling-II: Use cases, Use case diagrams, Activity diagrams, Common modeling techniques
Advanced Behavioral Modeling: Events and signals, state machines, processes and Threads, time and space, state chart diagrams, Common modeling techniques.

UNIT V
Architectural Modeling: Component, Deployment, Component diagrams, Deployment diagrams, Common modeling techniques. Case Studies

TEXT BOOKS
2. UML 2 Toolkit, WILEY-Dreamtech India Pvt. Ltd.: Hans-Erik Eriksson, Magnus Penker, Brian Lyons, David Fado.

REFERENCES
3. Practical Object-Oriented Design with UML:TATA McGrawHill. Mark Priestley:
Unit I
Trends and Reasons to Go Green:
Overview and Issues, Problems, Cost savings, Current Initiatives and standards, Global Initiatives

Unit II
Consumption Issues
Minimizing Power Issues, Cooling, Changing the way we work, Going Paper less, Recycling, Hardware Considerations,

Unit III
The Greening Process
Data Center Design and Redesign, Greening your Information Systems, Staying Green

Unit IV
Virtualization
Virtual Server Implementation Plan, Desktop Virtualization, Benefits, Desktop access, Virtual Printing,

Unit V
Data Replication and Disk Technology Advancements
Data Replication Methods, Disk Technology Advancements, The Green data Center, Cloud Computing, Remote Monitoring

TEXTBOOKS
2. Foundation Of Green It, Consolidation, Virtualization, Efficiency, And Roi In The Data Center, Marty Poniatowski- Prentice Hall Publications

REFERENCES
2. Green IT for Sustainable Business Practice- Mark G. O’ Neil, BCS The chartered institute for IT
UNIT-I: Introduction to disaster
Concepts and definitions (Disaster, Hazard, Vulnerability, Resilience, Risks)

UNIT-II: Disasters: Classifications, Causes, Impacts (including social, economic, political, environment, health, psychosocial, etc.)
Differential impacts - in terms of caste, class, gender, age, location, disability Global trends in disasters. Urban disaster, pandemics, complex emergencies, Climate change

UNIT-III: Approaches to disaster Risk reduction
Disaster cycle - its analysis, phase, Culture of safety, prevention, mitigation and preparedness, community based DRR, Structural measures, roles and responsibilities of community. Panchayati Raj Institutions/Urban Local Bodies (PRIs/ULBs), states, center and other stake-holders.

UNIT-IV: Inter-relationship between Disaster and Development
Factors affecting Vulnerabilities, differential impacts, impact of development projects such as dams, embankments, change in land-use etc. Climate change Adaption. Relevance of indigenous knowledge, appropriate technology and local resources.

UNIT-V: Disaster Risk Management in India
Hazard and vulnerability profile of India Components of Disaster relief: Water, food, sanitation, shelter, health, waste management Institutional arrangements (Mitigation, Response and Preparedness, DM Act Policy, Other related polices, plan, programmes and legislation)

Project Work: (Field Work, Case Studies)
The project/fieldwork is meant for students to understand vulnerabilities and to work on reducing disaster risks and to build a culture of safety. Projects must be conceived creatively based on the geographic location and hazard.
Suggested Reading list:
7. Govt.of India; Disaster Management Act 2005, Government of India, New Delhi.
UNIT I:

UNIT II:

UNIT III:

Sequencing models: Solution of Sequencing Problem – Processing n Jobs through 2 Machines – Processing n Jobs through 3 Machines – Processing 2 Jobs through m machines – Processing n Jobs through m machines.

UNIT IV:

UNIT V:
Replacement Models: Replacement of Items that Deteriorate whose maintenance costs increase with time without change in the money value, Replacement of items that fail suddenly: individual replacement policy, Group Replacement policy. Inventory models: Inventory costs, Models with deterministic demand – model (a) demand rate uniform and production rate infinite, model (b) demand rate non-uniform and production rate infinite, model (c) demand rate uniform and production rate finite.
TEXT BOOKS:

REFERENCES:
UNIT I.

UNIT II:

UNIT III:
STORAGE MANAGEMENT - Backup & Storage, Archive & Retrieve, Disaster Recovery, Space Management, Database & Application Protection, Bare Machine Recovery, Data Retention

UNIT IV:

UNIT V
Textbooks:
Object Oriented Analysis Lab

The student should take up the case studies of ATM system, Online Reservation System and Model it in different views i.e. Use case view, logical view, component view, Deployment view.

For our case study we have chosen an airport—the UML Airport. Anyone who has ever been on a flight will have no problems understanding our example.

We will restrict our example to those areas of the airport that passengers are in contact with during departure, meaning we will take a closer look at passenger check-in and boarding. Figure 2.1 illustrates how passenger services can be distinguished from other areas of the airport. It shows the various stages that passengers go through until they are seated in the airplane, buckled up, and the plane is ready to take off. Not all stages passengers go through are related to passenger services. The stages that belong to passenger services are framed and printed in italic font.

A sequence of steps like this is called a scenario. However, the depicted scenario is only one of many possible scenarios. The following exceptions are possible for passenger check-in and boarding:

- The passenger only has carry-on luggage.
- The passenger doesn't buy anything at the newsstand.
- The passenger is running late and now has to check in as quickly as possible.
- The passenger loses his or her boarding pass.
- The passenger arrived by plane and merely has to change planes, meaning that he or she doesn't leave the transit area.
- The passenger checks in, but falls asleep on an uncomfortable chair in the waiting area, and misses the departure of his or her flight, despite being called repeatedly.
- The passenger doesn't get through passport inspection because his or her passport has expired.
Figure 2.1 Case Study: “Passenger takes plane to go on vacation”
Think about which of the above-mentioned scenarios are relevant for passenger departure and whether there are more relevant scenarios than those mentioned.
Figure 2.2 Schematic illustration of the UML Airport

The schematic illustration of the UML Airport in Figure 2.2 should help you to understand the events of the case study better. Many areas around the main passenger services are related in one or more ways to passenger services. Some examples are: Ticket sales, Newsstand, Duty-free shop, Passport inspection/immigration, Flight control, Information desk, Baggage check-in and transportation. Passenger services have to exchange data with some of these areas. They also have to communicate with other areas of the airport. We will introduce those areas when we discuss business models and models of system integration. Therefore, the case study will be expanded. UML Airport is a small airport and the case study has been purposely kept simple. Anyone who has ever been on a flight should be able to understand the examples. The purpose of the case study is to provide a coherent example throughout the chapters of this book. A few details of the case study require further explanation: The plane ticket consists of the actual ticket and up to four additional sections. The ticket is the little booklet that has a separate coupon for every part of the trip. For example, a ticket could contain a coupon for the flight from
Zurich to Frankfurt, one for the flight from Frankfurt to London, and one for the return flight from London to Zurich. Each time at check-in the appropriate coupon will be exchanged for a boarding pass. The ticket always stays with the passenger. We distinguish between a flight and a flight number. For instance, a flight number could be LH435 or LX016. It stands for a regular flight that occurs at a certain time from the departure airport to the destination airport. A flight, on the other hand, would be, for example, LH435 on 26th August, 2000. It is, so to speak, an execution of a flight number. A flight could be canceled due to bad weather. A flight number is used as long as the airline offers a certain flight regularly.

We differentiate between three options for check-in:

Normal check-in with luggage at a normal check-in counter
Express check-in without luggage at a special check-in counter
Automated check-in without luggage at a machine

Draw UML diagrams
1. Class Diagram
2. Use case diagram
3. State chart diagram
4. Activity diagram
5. Component diagram
6. Deployment diagram

Software Testing Lab

List of Experiments
1. Write programs in „C“ Language to demonstrate the working of the following constructs:
   i) do…while ii) while….do iii) if…else iv) switch v) for
2. “A program written in „C“ language for Matrix Multiplication fails” Introspect the causes for its failure and write down the possible reasons for its failure.
3. Take any system (e.g. ATM system) and study its system specifications and report the various bugs.
4. Create a test plan document for any application (e.g. Library Management System)
5. Study of Win Runner/QTP for functional testing.
6. Study of Load Runner for Load/Stress testing
7. Testing the performance of a webpage
8. Testing the performance of a Database Server
9. Study of any test management tool (e.g. Test Director)
10. Study of any open source-testing tool (e.g. Test Link)
LINUX PROGRAMMING

Note: Use Bash for Shell scripts.

1. Write a shell script that accepts a file name, starting and ending line numbers as arguments and displays all the lines between the given line numbers.
2. Write a shell script that deletes all lines containing a specified word in one or more files supplied as arguments to it.
3. Write a shell script that displays a list of all the files in the current directory to which the user has read, write and execute permissions.
4. Write a shell script that receives any number of file names as arguments checks if every argument supplied is a file or a directory and reports accordingly. Whenever the argument is a file, the number of lines on it is also reported.
5. Write a shell script that accepts a list of file names as its arguments, counts and reports the occurrence of each word that is present in the first argument file on other argument files.
6. Write a shell script to list all of the directory files in a directory.
7. Write a shell script to find factorial of a given integer.
8. Write an awk script to count the number of lines in a file that do not contain vowels.
9. Write an awk script to find the number of characters, words and lines in a file.
10. Write a c program that makes a copy of a file using standard I/O and system calls.
11. Implement in C the following Unix commands using System calls
    a. cat   b. mv
12. Write a program that takes one or more file/directory names as command line input and reports the following information on the file.
    A. File type. B. Number of links.
    C. Time of last access. D. Read, Write and Execute permissions.
13. Write a C program to emulate the Unix ls –l command.
14. Write a C program to list for every file in a directory, its inode number and file name.
15. Write a C program that demonstrates redirection of standard output to a file. Ex: ls > f1.
16. Write a C program to create a child process and allow the parent to display “parent” and the child to display “child” on the screen.
17. Write a C program to create a Zombie process.
18. Write a C program that illustrates how an orphan is created.
19. Write a C program that illustrates how to execute two commands concurrently with a command pipe. Ex:- ls –l | sort
20. Write a C program (sender.c) to create a message queue with read and write permissions to write 3 messages to it with different priority numbers.
21. Write a C program (receiver.c) that receives the messages (from the above message queue as specified in (20)) and displays them.

TEXT BOOKS:

DATA MINING
The objective of the lab exercises is to use data mining techniques to identify customer segments and understand their buying behavior and to use standard databases available to understand DM processes using WEKA (or any other DM tool).
1. Gain insight for running pre-defined decision trees and explore results using MS OLAP Analytics.
2. Using IBM OLAP Miner - Understand the use of data mining for evaluating the content of multidimensional cubes.
3. Using Teradata Warehouse Miner - Create mining models that are executed in SQL. (BI Portal Lab: The objective of the lab exercises is to integrate pre-built reports into a portal application)
4. Publish cognos cubes to a business intelligence portal. Metadata & ETL Lab: The objective of the lab exercises is to implement metadata import agents to pull metadata from leading business intelligence tools and populate a metadata repository. To understand ETL processes.
5. Import metadata from specific business intelligence tools and populate a Metadata repository. Publish metadata stored in the repository.
6. Load data from heterogeneous sources including text files into a pre-defined warehouse schema. Case study
7. Design a data mart from scratch to store the credit history of customers of a bank. Use this credit profiling to process future loan applications.
8. Design and build a Data Warehouse using bottom up approach titled ‘Citizen Information System’. This should be able to serve the analytical needs of the various Governments Departments and also provide a global integrated view.

Credit Risk Assessment Description:
The business of banks is making loans. Assessing the credit worthiness of an applicant is of crucial importance. You have to develop a system to help a loan officer decide whether the credit of a customer is good, or bad. A bank's business rules regarding loans must consider two opposing factors. On the one hand, a bank wants to make as many loans as possible. Interest on these loans is the banks profit source. On the other hand, a bank cannot afford to make too many bad loans. Too many bad loans could lead to the collapse of the bank. The bank's loan policy must involve a compromise: not too strict, and not too lenient. To do the assignment, you first and foremost need some knowledge about the world of credit. You can acquire such knowledge in a number of ways.

Knowledge Engineering. Find a loan officer who is willing to talk. Interview her and try to represent her knowledge in the form of production rules.

Books. Find some training manuals for loan officers or perhaps a suitable textbook on finance. Translate this knowledge from text form to production rule form.

Common sense. Imagine yourself as a loan officer and make up reasonable rules which can be used to judge the credit worthiness of loan applicant.

Case histories. Find records of actual cases where competent loan officers correctly judged when, and when not to, approve a loan application.

The German Credit Data:
Actual historical credit data is not always easy to come by because of confidentiality rules. Here is one such dataset, consisting of 1000 actual cases collected in Germany. credit dataset (original) Excel spreadsheet version of the German credit data. (Download from web) In spite of the fact that the data is German, you should probably make use of it for this assignment. (Unless you really can consult a real loan officer !)

A few notes on the German dataset
- DM stands for Deutsche Mark, the unit of currency, worth about 90 cents Canadian (but looks and acts like a quarter).
- owns_telephone. German phone rates are much higher than in Canada so fewer people own telephones.
- foreign_worker. There are millions of these in Germany (many from Turkey). It is very hard to get German citizenship if you were not born of German parents.
- There are 20 attributes used in judging a loan applicant. The goal is the classify the applicant into one of two categories, good or bad.

1. List all the categorical (or nominal) attributes and the real-valued attributes separately.
2. What attributes do you think might be crucial in making the credit assessment? Come up with some simple rules in plain English using your selected attributes.

3. One type of model that you can create is a Decision Tree - train a Decision Tree using the complete dataset as the training data. Report the model obtained after training.

4. Suppose you use your above model trained on the complete dataset, and classify credit good/bad For each of the examples in the dataset. What % of examples can you classify correctly? (This is also called testing on the training set) Why do you think you cannot get 100 % training accuracy?

5. Is testing on the training set as you did above a good idea? Why or Why not?

6. One approach for solving the problem encountered in the previous question is using cross-validation. Describe what is cross-validation briefly. Train a Decision Tree again using cross-validation and report your results. Does your accuracy increase/decrease? Why? (10 marks)

7. Check to see if the data shows a bias against "foreign workers" (attribute 20),or "personal-status" (attribute 9). One way to do this (perhaps rather simple minded) is to remove these attributes from the dataset and see if the decision tree created in those cases is significantly different from the full dataset case which you have already done. To remove an attribute you can use the preprocess tab in Weka's GUI Explorer. Did removing these attributes have any significant effect? Discuss.

8. Another question might be, do you really need to input so many attributes to get good results? Maybe only a few would do. For example, you could try just having attributes 2, 3, 5, 7, 10, 17 (and 21, the class attribute (naturally)). Try out some combinations. (You had removed two attributes in problem 7. Remember to reload the arff data file to get all the attributes initially before you start selecting the ones you want.)

9. Sometimes, the cost of rejecting an applicant who actually has a good credit (case 1) might be higher than accepting an applicant who has bad credit (case 2). Instead of counting the misclassifications equally in both cases, give a higher cost to the first case (say cost 5) and lower cost to the second case. You can do this by using a cost matrix in Weka. Train your Decision Tree again and report the Decision Tree and cross-validation results. Are they significantly different from results obtained in problem 6 (using equal cost)?

10. Do you think it is a good idea to prefer simple decision trees instead of having long complex decision trees? How does the complexity of a Decision Tree relate to the bias of the model?

11. You can make your Decision Trees simpler by pruning the nodes. One approach is to use Reduced Error Pruning - Explain this idea briefly. Try reduced error pruning for training your Decision Trees Using cross-validation (you can do this...
in Weka) and report the Decision Tree you obtain. Also, report your accuracy using the pruned model. Does your accuracy increase?

12. Extra Credit): How can you convert a Decision Trees into "if-then-else rules". Make up your own small Decision Tree consisting of 2-3 levels and convert it into a set of rules. There also exist different classifiers that output the model in the form of rules - one such classifier in Weka is rules.PART, train this model and report the set of rules obtained. Sometimes just one attribute can be good enough in making the decision, yes, just one! Can you predict what attribute that might be in this dataset? OneR classifier uses a single attribute to make decisions (it chooses the attribute based on minimum error). Report the rule obtained by training a oneR classifier. Rank the performance of j48, PART and oneR

Task Resources: Andrew Moore's Data Mining Tutorials (See tutorials on Decision Trees and Cross Validation) Decision Trees (Source: Tan, MSU) Tom Mitchell's book slides (See slides on Concept Learning and Decision Trees)

Weka resources:
Introduction to Weka (html version) (download ppt version)
Download Weka
Weka Tutorial
ARFF format
Using Weka from command line
Introduction
In an era of Technological advances and competition in the job market, it is necessary for students to possess soft skills and effective personal skills in addition to technical skills. It is essential that students possess the ability to convey technical ideas in a sound and simple manner. Planning and execution are the two important activities required for them. It is the execution that requires the soft skills as it most of the times deals with people. This course on “Soft Skills and Personality Development” is aimed at enhancing students’ career prospects.

This course uncovers the principles of soft skills and personality skills, the ways to integrate them in different phases of career that require personal and interpersonal skills. It focuses on transforming the way of one’s thinking and reacting to the environment. It equips the students with self analysis and gain self- control through stress management and conflict management. It also helps students with study skills. It helps students overcome their barriers and achieve excellence in performance and succeed in their chosen field of work.

Objectives
- enable students to convert the conceptual understanding of communication into everyday practice
- train students to ground concepts/ideas in their own experience
- enable students to exercise control over language use
- sensitize students to the nuances of the four basic communication skills –
- enable students to understand the concept and components of personality, so as to apply the acquired knowledge and march towards excellence in their academic careers.
- train students to become aware of their thinking styles and to enable them to convert thinking into performance
- prepare students to evolve mental models for intra-personal and inter-personal transactions
- make students reflect and improve their use of body language – posture, gesture, facial expression, tone
- sharpen memory skills and other study skills, which are vital for academic excellence.
- bring out the creativity and latent talents of students through goal setting
- train students for positive thinking to keep them in good stead at the time of crisis.
SYLLABUS

Unit I: Introduction to Personality Development
1. Definition and Basics of personality
   - Determinants of Personality - biological, psychological and socio-cultural factors
   - Need for personality Development
2. Analyzing strengths and Weaknesses
3. Corporate theories on Personality development
4. Increasing vocabulary
5. Body Language
6. Preparation of Self Introduction
7. Motivation
   - Self-analysis through SWOT
   - Techniques and strategies for self-motivation

Unit II: Techniques in Personality Development Stage I
1. Communication Skills
2. Listening
3. Communication Barriers
4. Overcoming these Barriers
5. Importance of Self Esteem -- Building Self-esteem & Self Confidence
6. Working on attitudes – aggressive, assertive and submissive
7. Goal Setting
8. Leadership and Team Building Skills
9. Group Discussion

Unit III: Techniques in Personality Development Stage II
1. Interpersonal relationships
   - Analysis of ego states, Transactions, Strokes and Life Positions
2. Stress Management
   - Concept, Nature and Dimensions of Stress
   - Causes, Impact and Managing Stress
   - Relaxation Techniques
3. The Power of positive thinking
   - Nurturing creativity, decision-making and problem solving
   - Goals and techniques for positive thinking
   - Enhancement of concentration through positive thinking
4. Projecting a Positive Social Image
   - Grooming & Social Etiquette
   - Voice Modulation
   - Public Speaking
Unit IV: Techniques in Personality Development Stage III
- Conflict Management
- Introduction to Conflict Management
- Levels of Conflict
- Managing Conflict
- Time Management
- Concept
- Importance and Need
- Steps towards better Time Management

Unit V: Memory and Study Skills
- Definition and importance of memory
- Causes of forgetting
- How to forget (thought stopping), how to remember (techniques for improving memory)
- The technique of passing exams—Management of examination fear.

PRACTICAL TRAINING
The course would include the following practical exercises.
- Icebreaking, Brainstorming and simulation exercises. Thought stopping.
- Memory and study skills training
- Role play and record work

REFERENCES
UNIT I
HTML Common tags: List, Tables, images, forms, Frames; Cascading Style sheets. Introduction to Java Scripts, Objects in Java Script, Dynamic HTML with Java Script.

UNIT II
Introduction to XML: Document type definition, XML Schemas, Document Object model, Presenting XML, Using XML Processors: DOM and SAX.
Java Beans: Introduction to Java Beans, Advantages of Java Beans, BDK Introspection, Using Bound properties, Bean Info Interface, Constrained properties Persistence, Customizes, Java Beans API, Introduction to EJB’s.

UNIT III

UNIT IV

UNIT V
JSP Application Development: Generating Dynamic Content, Using Scripting Elements Implicit JSP Objects, Conditional Processing: Displaying Values Using an Expression to Set an Attribute, Declaring Variables and Methods Error Handling and Debugging Sharing Data Between JSP pages, Requests, and Users Passing Control and Date between Pages – Sharing Session and Application Data – Memory Usage Considerations, Accessing a Database from a JSP page, Deploying JAVA Beans in a JSP Page, Introduction to struts framework.

TEXT BOOKS
1. Web Programming, building internet applications, Chris Bates 2nd edition, WILEY Dreamtech (UNIT s 1, 2)
2. Core SERVLETS AND JAVASERVER PAGES VOLUME 1: CORE TECHNOLOGIES By Marty Hall and Larry Brown Pearson (UNITs 3,4,5)
REFERENCES
1. Programming world wide web-Sebesta, Pearson
2. Internet and World Wide Web – How to program by Dietel and Nieto
   PHI/Pearson Education Asia.
4. Java: The complete Reference, 7th Edition by Herbert Schildt. TMH.
UNIT I

Organizing: Meaning – Features – process of organization – Principles of organization - Elements of organizations – Organization chart – span of control (Graicunas Formulae), Centralisation 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 II
Human Resources Management : Concepts of HRM, Basic functions of HR Manager: Human Resource Planning( definition, objectives and process), Recruitment(definition, sources and techniques), Selection (definition & process), induction and orientation, Training and Development(definition, need and methods), employee exit process, employee relations management, employee compensation and benefits administration, Job Evaluation( objectives, process & methods) and performance appraisals ( objectives, process & methods)

UNIT III

UNIT IV
Operations Management: Plant location, Types of Plant Layout-Methods of production (Job, batch and Mass Production), Work Study -Basic procedure involved in Method Study and Work Measurement
Materials Management: Objectives, Need for Inventory control, EOQ, ABC Analysis, Purchase Procedure, value analysis, JIT, six sigma, TQM, supply chain management, Stores Management and Stores Records.

Marketing: Functions of Marketing, Marketing Mix, and Marketing Strategies based on Product Life Cycle, Channels of distribution

UNIT V

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)

TEXT BOOKS

1. Management Science, Aryasri TMH, 2009

REFERENCES

UNIT I

Theoretical Foundation for Distributed System: Limitation of Distributed system, absence of global clock, shared memory, Logical clocks, Lamport’s & vectors logical clocks.


UNIT II
Distributed Mutual Exclusion: Classification of distributed mutual exclusion, requirement of mutual exclusion theorem, Token based and non token based algorithms, performance metric for distributed mutual exclusion algorithms.

Distributed Deadlock Detection: system model, resource Vs communication deadlocks, deadlock prevention, avoidance, detection & resolution, centralized deadlock detection, distributed deadlock detection, path pushing algorithms, edge chasing algorithms.

UNIT III


UNIT IV

UNIT V

Transactions and Concurrency Control: Transactions, Nested transactions, Locks, Optimistic Concurrency control, Timestamp ordering, Comparison of methods for concurrency control.

Distributed Transactions: Flat and nested distributed transactions, Atomic Commit protocols, Concurrency control in distributed transactions, Distributed deadlocks, Transaction recovery.

Replication: System model and group communication, Fault - tolerant services, highly available services, Transactions with replicated data.

TEXT BOOKS

2. Distributed operating system – Andrew. S. Tanenbaum, PHI.

REFERENCES

3. Distributed Operating Systems, Pradeep K. Sinha, PHI.
UNIT I


UNIT II


J2ME Best Practices and Patterns: The Reality of Working in a J2ME World, Best Practices

UNIT III

Commands, Items, and Event Processing: J2ME User Interfaces, Display Class, The Palm OS Emulator, Command Class, Item Class, Exception Handling

High-Level Display Screens: Screen Class, Alert Class, Form Class, Item Class, List Class, Text Box Class, Ticker Class

Low-Level Display Canvas: The Canvas, User Interactions, Graphics, Clipping Regions, Animation

UNIT IV

Record Management System: Record Storage, Writing and Reading Records, Record Enumeration, Sorting Records, Searching Records, Record Listener.

JDBC Objects: The Concept of JDBC, JDBC Driver Types, JDBC Packages, Overview of the JDBC Process, Database Connection, statement Objects, Result set, Transaction Processing, Metadata, Data Types, Exceptions.

JDBC and Embedded SQL: Model Programs, Tables, Indexing, Inserting Data into Tables, Selecting Data from a Table, Metadata, Updating Tables, Deleting Data from a Table, Joining Tables, Calculating Data, Grouping and Ordering Data, Sub queries, VIEWs

UNIT V

TEXT BOOKS


REFERENCES

(ITD1113) NETWORK MANAGEMENT SYSTEMS

UNIT I

UNIT II
SNMPv1 Network Management: Organization and Information and Information Models.

UNIT III
SNMP Management: SNMPv2: Major Changes in SNMPv2, SNMPv2 System Architecture, SNMPv2 Structure of Management Information, the SNMPv2 Management Information Base, SNMPv2 Protocol.
SNMP Management: RMON: What is Remote Monitoring? , RMON SMI and MIB, RMON1, RMON2, ATM Remote Monitoring, A Case Study of Internet Traffic Using RMON

UNIT IV

UNIT V
TEXT BOOKS
1. Network Management, Principles and Practice, Mani Subramanian, Pearson Education.

REFERENCES
1. Network management, Morris, Pearson Education.
2. Distributed Network Management, Paul John Wiley.
UNIT I
Introduction to enterprise applications and their types, software engineering methodologies, life cycle of raising an enterprise application, introduction to skills required to build an enterprise application, key determinants of successful enterprise applications, and measuring the success of enterprise applications.

UNIT II
Inception of enterprise applications, enterprise analysis, business modeling, requirements elicitation, use case modeling, prototyping, non functional requirements, requirements validation, planning and estimation.

UNIT III
Concept of architecture, views and viewpoints, enterprise architecture, logical architecture, technical architecture - design, different technical layers, best practices, data architecture and design – relational, XML, and other structured data representations, Infrastructure architecture and design elements - Networking, Internetworking, and Communication Protocols, IT Hardware and Software, Middleware, Policies for Infrastructure Management, Deployment Strategy, Documentation of application architecture and design.

UNIT IV
Construction readiness of enterprise applications - defining a construction plan, defining a package structure, setting up a configuration management plan, setting up a development environment, introduction to the concept of Software Construction Maps, construction of technical solutions layers, methodologies of code review, static code analysis, build and testing, dynamic code analysis – code profiling and code coverage.

UNIT V
Types and methods of testing an enterprise application, testing levels and approaches, testing environments, integration testing, performance testing, penetration testing, usability testing, globalization testing and interface testing, user acceptance testing, rolling out an enterprise application.
TEXT BOOKS
1. Raising Enterprise Applications – Published by John Wiley, authored by Anubhav Pradhan, Satheesha B. Nanjappa, Senthil K. Nallasamy, Veerakumar Esakimuthu
2. Building Java Enterprise Applications – Published by O'Reilly Media, authored by Brett McLaughlin

REFERENCES
1. Software Requirements: Styles & Techniques – published by Addison-Wesley Professional
UNIT I
Attributes of Output Primitives: Line and Curve Attributes-Color and Gray scale levels- Area Fill Attributes- Character Attributes-Bundled Attributes- Inquiry Functions-Ant aliasing
UNIT II
TWO DIMENSIONAL GEOMETRICAL TRANSFORMATION AND VIEWING: Two dimensional geometric transformations - Matrix representations and homogeneous coordinates, composite transformations, Two dimensional viewing - viewing pipeline, viewing coordinate reference frame; widow-to-viewport coordinate transformation, Cohen -Sutherland-and Cyrus-beck line clipping algorithms, Southerland-Hodgeman polygon clipping algorithm.
UNIT III
THREE DIMENSIONAL OBJECT REPRESENTATION: Three dimensional concepts; Three dimensional object representations - Polygon surfaces - Polygon tables - Plane equations - Polygon meshes; Curved Lines and surfaces, Quadratic surfaces; Blobby objects; Spline representations - Bezier curves and surfaces - B-Spline curves and surfaces
UNIT IV
THREE DIMENSIONAL GEOMETRICAL TRANSFORMATION AND VIEWING: Three dimensional geometric and modeling transformations - Translation, Rotation, Scaling, composite transformations
Three dimensional viewing - viewing pipeline, viewing coordinates, Projections, Clipping; Visible surface detection methods: Depth buffer, scan line, Depth sorting, BSP-tree methods, Area sud-division and octree methods

UNIT V
COMPUTER ANIMATION: Design of Animation Sequence, General computer Animation functions, Raster animation, Computer animation languages, key frame systems, motion specifications

TEXT BOOKS
2. “Computer graphics principles &practice”, second edition in c, Foley, VanDam, Feiner and Hughes, Pearson Education

REFERENCES
UNIT I
Conventional Software Management: The waterfall model, conventional software Management performance.

UNIT II
The old way and the new way: The principles of conventional software Engineering, principles of modern software management, transitioning to an iterative process.
Life cycle phases: Engineering and production stages, Inception, Elaboration, Construction, Transition phases.
Artifacts of the process: The artifact sets, Management artifacts, Engineering artifacts, programmatic artifacts.

UNIT III
Checkpoints of the process: Major mile stones, Minor Milestones, Periodic status assessments.
Iterative Process Planning: Work breakdown structures, planning guidelines, cost and schedule estimating, Iteration planning process, Pragmatic planning.

UNIT IV
Project Control and Process instrumentation: The seven core Metrics, Management indicators, quality indicators, life cycle expectations, pragmatic Software Metrics, Metrics automation.
Tailoring the Process: Process discriminants.

UNIT V
Project Organizations and Responsibilities: Line-of-Business Organizations
Future Software Project Management: Modern Project Profiles, Next generation Software economics, modern process transitions.
Case Study: The command Center Processing and Display system- Replacement (CCPDS-R)
TEXT BOOKS

REFERENCES
1. Software Project Management, Joel Henry, Pearson Education.
UNIT I


Computer Forensics Evidence and Capture: Data Recovery Defined- Data Back-up and Recovery- The Role of Back-up in Data Recovery- The Data Recovery Solution.

UNIT II


UNIT III

Computer Forensics analysis and validation: Determining what data to collect and analyze, validating forensic data, addressing data – hiding techniques, performing remote acquisitions.

Network Forensics: Network Forensics overview, performing live acquisitions, developing standard procedures for network forensics, unsing network tools, examining the honeynet project.

UNIT IV

Processing crime and incident scenes: Identifying digital evidence, collecting evidence in private-sector incident scenes, processing law enforcement crime scenes, preparing for a search, securing a computer incident or crime scene, seizing digital evidence at the scene, storing digital evidence, obtaining a digital hash, reviewing a case.
Current computer forensic tools: evaluating computer forensic tool needs, computer forensics software tools, computer forensics hardware tools, validating and testing forensics software.

UNIT V
E-Mail investigations: Exploring the role of E-mail in investigation, exploring the role of the client and server in E-mail, investigating e-mail crimes and violations, understanding e-mail servers, using specialized e-mail forensic tools.

Cell phone and mobile device forensics: Understanding mobile device forensics, understanding acquisition procedures for cell phones and mobile devices.

Working with windows and DOS Systems: Understanding file systems, exploring Microsoft File Structures, Examining NTFS Disks, Understanding whole disk encryption, windows registry, Microsoft startup tasks, MS-DOS Startup tasks, virtual machines.

TEXT BOOKS

REFERENCE BOOKS
1. Real Digital Forensics by Keith J.Jones, Rechard Bejtlich, Curtis W.Rose, Addison-Wesley Pearson Education.
4. Homeland Security, Techniques & Technologies by Jesus Mena, Firewall Media
6. Windows forensics by Chad Steel, Wiley India Edition.
UNIT I
INTRODUCTION: Security Attacks (Interruption, Interception, Modification and Fabrication), Security Services (Confidentiality, Authentication, Integrity, Non-repudiation, access Control and Availability) and Mechanisms, A model for Internetwork security, Classical Encryption techniques, Fiestel Cipher Structure, Data Encryption Standard, Block Cipher Design Principles and Modes of Operation, Triple DES, IDEA, BLOWFISH, RC-4, Evaluation criteria for AES, AES Cipher, Placement of Encryption Function, Traffic Confidentiality

UNIT II

UNIT III

UNIT IV

UNIT V

TEXT BOOKS
REFERENCES
3. “Hack Proofing your network” by Ryan Russell, Dan Kaminsky, Rain Forest, Puppy, Joe Grand, David Ahmad, Hal Flynn Ido Dubrawsky, Steve W. Manzuik and Ryan Permeh, wiley Dreamtech
UNIT –I Introduction :
What Is a Design Pattern?, Design Patterns in Smalltalk MVC, Describing Design Patterns, The Catalog of Design Patterns, Organizing the Catalog, How Design Patterns Solve Design Problems, How to Select a Design Pattern, How to Use a Design Pattern.

UNIT-II

UNIT-III
Creational Patterns : Abstract Factory, Builder, Factory Method, Prototype, Singleton, Discussion of Creational Patterns. Structural Pattern Part-I : Adapter, Bridge, Composite

UNIT-IV

UNIT-V
Behavioral Patterns Part-II : Mediator, Memento, Observer, State, Strategy, Template Method, Visitor, Discussion of Behavioral Patterns. What to Expect from Design Patterns, A Brief History, The Pattern Community An Invitation, A Parting Thought.

TEXT BOOK :
1. Design Patterns By Erich Gamma, Pearson Education

REFERENCES :
4. Head First Design Patterns By Eric Freeman-Oreilly-spd
5. Design Patterns Explained By Alan Shalloway, Pearson Education.
UNIT I
Introduction to Wireless Networks:
Wireless LAN: Infrared vs radio transmission, Infrastructure and ad hoc networks, IEEE 802.11-System architecture, protocol architecture, Physical layer, Medium access control layer and MAC management. HIPER LAN-protocol architecture, physical layer channel access control sub layer, information bases and networking. Bluetooth-User scenarios, Physical layer, MAC Layer, Networking, Security and Link Management.

UNIT II
Mobile computing (MC): Introduction to MC, Novel Applications, Limitations and Architecture
(Wireless) Medium Access Control (MAC): Motivation for a Specialized MAC (Hidden and Exposed Terminals, Near and Far Terminals), SDMA, FDMA, TDMA, CDMA, MAC Protocols for GSM.

UNIT III
Mobile IP Network Layer: IP and Mobile IP Network Layers, Packet Delivery and Handover Management, Registration, Tunneling and Encapsulation, Route Optimization, DHCP.

UNIT IV

UNIT V
Mobile Ad hoc Networks (MANETs): Introduction, localization, MAC issues, Routing protocols, global state routing (GSR), Destination sequenced distance vector routing (DSDV), Dynamic source routing (DSR), Ad Hoc on demand distance vector routing (AODV), Temporary ordered routing algorithm (TORA), QoS in Ad Hoc Networks, Applications & Challenges of a MANET.
TEXT BOOKS

REFERENCES
(ITD1208) WEB TECHNOLOGIES LABORATORY

OBJECTIVE
To create a fully functional website and to Develop an online Book store using which we can sell books (Ex. amazon .com).

HARDWARE AND SOFTWARE REQUIRED
1. A working computer system with either Windows or Linux
2. A web browser either IE or firefox
3. Tomcat web server
4. XML editor like Altova Xml-spy [www.Altova.com/XMLSpy – free ] , Stylusstudio , etc.,
5. A database either Mysql or Oracle
6. JVM(Java virtual machine) must be installed on your system
7. BDK(Bean development kit) must be also be installed

WEEK 1
Design the following static web pages required for an online book store web site.

1) HOME PAGE:
The static home page must contain three frames.
Top frame  : Logo and the college name and links to Home page, Login page, Registration page, Catalogue page and Cart page (the description of these pages will be given below).
Left frame  : At least four links for navigation, which will display the catalogue of respective links. For e.g.: When you click the link “CSE” the catalogue for CSE Books should be displayed in the Right frame.
Right frame: The pages to the links in the left frame must be loaded here. Initially this page contains description of the web site.
2) LOGIN PAGE:
This page looks like below:

```
+-----------------+-----------------+-----------------+-----------------+-----------------+
|                 |                 |                 |                 |                 |
|                 |                 |                 |                 |                 |
| Logo            | Web Site Name   |                 |                 |                 |
+-----------------+-----------------+-----------------+-----------------+-----------------+
| Home            | Login           | Registration    | Catalogue       | Cart            |
|                 |                 |                 |                 |                 |
+-----------------+-----------------+-----------------+-----------------+-----------------+
| CSE             | ECE             | EEE             | CIVIL           |
+-----------------+-----------------+-----------------+-----------------+

Login : [Textbox]
Password: [Textbox]
Submit
Reset
```

3) CATALOGUE PAGE:
The catalogue page should contain the details of all the books available in the web site in a tabular format.
The details should contain the following:

2. Book Title, Author Name, Publisher.
4. Add to cart button.
## WEEK 2

### 4) CART PAGE:
The cart page contains the details about the books which are added to the cart.

The cart page should look like this:

<table>
<thead>
<tr>
<th>Logo</th>
<th>Web Site Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Home</td>
<td>Login</td>
</tr>
<tr>
<td>CSE</td>
<td>XML Bible</td>
</tr>
<tr>
<td>ECE</td>
<td>AI</td>
</tr>
<tr>
<td>EEE</td>
<td>Java 2</td>
</tr>
<tr>
<td>CIVIL</td>
<td>HTML in 24 hours</td>
</tr>
</tbody>
</table>

<p>| Book : XML Bible | | |</p>
<table>
<thead>
<tr>
<th>Price</th>
<th>Quantity</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>$40.5</td>
<td>1</td>
<td>$40.5</td>
</tr>
</tbody>
</table>

### 5) REGISTRATION PAGE:
Create a “registration form “with the following fields

<table>
<thead>
<tr>
<th>Logo</th>
<th>Web Site Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Home</td>
<td>Login</td>
</tr>
<tr>
<td>IT</td>
<td>Book name</td>
</tr>
<tr>
<td>CSE</td>
<td>Java 2</td>
</tr>
<tr>
<td>ECE</td>
<td>XML bible</td>
</tr>
</tbody>
</table>

<p>| Book : AI | | |</p>
<table>
<thead>
<tr>
<th>Price</th>
<th>Quantity</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>$63</td>
<td>1</td>
<td>$63</td>
</tr>
</tbody>
</table>

<p>| Book : Java 2 | | |</p>
<table>
<thead>
<tr>
<th>Price</th>
<th>Quantity</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>$35.5</td>
<td>2</td>
<td>$70</td>
</tr>
</tbody>
</table>

<p>| Book : HTML in 24 hours | | |</p>
<table>
<thead>
<tr>
<th>Price</th>
<th>Quantity</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>$50</td>
<td>1</td>
<td>$50</td>
</tr>
</tbody>
</table>

Total amount: $130.5
1) Name (Text field)
2) Password (password field)
3) E-mail id (text field)
4) Phone number (text field)
5) Sex (radio button)
6) Date of birth (3 select boxes)
7) Languages known (check boxes – English, Telugu, Hindi, Tamil)
8) Address (text area)

WEEK 3
VALIDATION:
a) Write JavaScript to validate the following fields of the above registration page.
   1. Name (Name should contains only alphabets and the length should not be less than 6 characters).
   2. Password (Password should not be less than 6 characters length).
   3. E-mail id (should not contain any invalid and must follow the standard pattern name@domain.com)
   4. Phone number (Phone number should contain 10 digits only).
b) Write JavaScript to validate the above login page with the above parameters.

WEEK 4
Design a web page using CSS (Cascading Style Sheets) which includes the following:
   1) Use different font, styles:
      In the style definition you define how each selector should work (font, color etc.).
      Then, in the body of your pages, you refer to these selectors to activate the styles.
      For example:

      <HTML>
      <HEAD>
      <style type="text/css">
      B.headline {color:red; font-size:22px; font-family:arial; text-decoration:underline}
      </style>
      </HEAD>
      <BODY>
      <b>This is normal bold</b><br>
      <b class="headline">This is headline style bold</b>
      </BODY>
      </HTML>
2) Set a background image for both the page and single elements on the page. You can define the background image for the page like this:

```html
BODY {background-image:url(myimage.gif);}
```

3) Control the repetition of the image with the background-repeat property.
   As background-repeat: repeat Tiles the image until the entire page is filled, just like an ordinary background image in plain HTML.

4) Define styles for links as

```html
A:link
A:visited
A:active
A:hover
```

Example:

```html
A:link {text-decoration: none}
A:visited {text-decoration: none}
A:active {text-decoration: none}
A:hover {text-decoration: underline; color: red;}
</style>
```

5) Work with layers:

For example:

```html
AYER 1 ON TOP:
<div style="position:relative; font-size:50px; z-index:2;">LAYER 1</div>
AYER 2 ON TOP:
<div style="position:relative; font-size:50px; z-index:3;">LAYER 1</div>
<div style="position:relative; top:-50; left:5; color:red; font-size:80px; z-index:1">LAYER 2</div>
```

6) Add a customized cursor: Selector {cursor:value} For example:

```html
<html>
<head>

  <style type="text/css">
    .xlink {cursor:crosshair}
    .hlink{cursor:help}
  </style>

</head>
<body>
  <b>
    <a href="mypage.htm" class="xlink">CROSS LINK</a>
  </b>
</body>
</html>
```
WEEK 5
Write an XML file which will display the Book information which includes the following:
1) Title of the book
2) Author Name
3) ISBN number
4) Publisher name
5) Edition
6) Price
Write a Document Type Definition (DTD) to validate the above XML file.
Display the XML file as follows.
The contents should be displayed in a table. The header of the table should be in color GREY. And the Author names column should be displayed in one color and should be capitalized and in bold. Use your own colors for remaining columns.
Use XML schemas XSL and CSS for the above purpose.
Note: Give at least for 4 books. It should be valid syntactically.
Hint: You can use some xml editors like XML-spy

WEEK 6
VISUAL BEANS:
Create a simple visual bean with a area filled with a color.
The shape of the area depends on the property shape. If it is set to true then the shape of the area is Square and it is Circle, if it is false.
The color of the area should be changed dynamically for every mouse click. The color should also be changed if we change the color in the "property window ".

WEEK 7
Install TOMCAT web server.
While installation assign port number 8000 to TOMCAT. Make sure that these ports are available i.e., no other process is using this port.
Access the above developed static web pages for books web site, using these servers by putting the web pages developed in week-1 and week-2 in the document root.
Access the pages by using the urls: http://localhost:8000/vnr/books.html

WEEK 8
User Authentication:
Assume four users user1, user2, user3 and user4 having the passwords pwd1,pwd2,pwd3 and pwd4 respectively. Write a servelet for doing the following.
1. Create a Cookie and add these four user id's and passwords to this Cookie.
2. Read the user id and passwords entered in the Login form (week1) and authenticate with the values (user id and passwords) available in the cookies. If he is a valid user (i.e., user-name and password match) you should welcome him by name(user-name) else you should display “You are not an authenticated user “. Use init-parameters to do this. Store the user-names and passwords in the web.xml and access them in the servlet by using the getInitParameters() method.

WEEK 9
Install JSDK.
User Authentication:
Assume four users user1, user2, user3 and user4 having the passwords pwd1, pwd2, pwd3 and pwd4 respectively. Write a servlet for doing the following.
1. Use init-parameters to do this. access them in the servlet by using the getInitParameters() method.
2. Read the user id and passwords entered in the Login form (week1) and authenticate with the values (user id and passwords) with above accessed values. If user is a valid user (i.e., user-name and password match) you should welcome user by name (user-name) else you should display “You are not an authenticated user “.

WEEK 10
Install a database (Mysql or Oracle).
Create a table which should contain at least the following fields: name, password, email-id, phone number (these should hold the data from the registration form).
Practice ‘JDBC’ connectivity.
Write a java program/servlet/JSP to connect to that database and extract data from the tables and display them. Experiment with various SQL queries.
Insert the details of the users who register with the web site, whenever a new user clicks the submit button in the registration page (week2).

WEEK 11
Write a JSP which does the following job: Insert the details of the 3 or 4 users who register with the web site (week9) by using registration form. Authenticate the user when he submits the login form using the user name and password from the database (similar to week8 instead of cookies).

WEEK 12
Create tables in the database which contain the details of items (books in our case like Book name, Price, Quantity, Amount)) of each category. Modify your catalogue page (week 2) in such a way that you should connect to the database and extract data from the tables and display them in the catalogue page using JDBC.
Objective:
In this lab, a student is expected to design, implement, document and present a mobile client/server system using standard Java and Java 2 Micro Edition (J2ME) platform. Specifically it is required to design and implement a system that consists mainly of a mobile client (MC) and a Proxy Server (PS). MC will be written in J2ME, MIDP 2.0, while PS will be written in standard Java. It is necessary to use a mobile phone emulator to develop and demonstrate the experiments. It may be necessary to use other components or existing resources (servers) as needed. For instance a database local to PS or a web service available on the Internet that can be invoked by the PS.

Week - 1: Installation of Java Wireless Toolkit (J2ME)
1) If the Java Development Kit (JDK) is not there or only having the Java Runtime Environment (JRE) installed, install the latest JDK from http://java.sun.com/javase/downloads/index.jsp. Current stable release of Java is JDK 6 Update 7 but check the web page in case there are newer non-beta releases available.
3) Run the installer (for example, for Windows it is: sun_java_wireless_toolkit-2_5_2-windows.exe). The installer checks whether a compatible Java environment has been pre-installed. If not, it is necessary to uninstall old versions of Java and perform Step 1 again. Once after successful installation of Java and the tool kit compile this program and run the following program in the toolkit. Steps to run this program in toolkit:
   1. Start -> All Programs -> Sun Java Tool Kit -> Wireless Tool Kit
   2. Click New Project – Enter Project Name -> Enter Class Name -> Click on Create Project.
   3. Choose appropriate API Selection and Configurations.
   4. Place Java Source file in WTK2.1 / WTK2.2\apps\projectname\src
   5. Build the Project.
   6. Run the Project.

   import javax.microedition.lcdui.*;
   import javax.microedition.midlet.*;
   public class HelloWorld extends MIDlet{
      private Form form;
      private Display display;
public HelloWorld()
{
    super();
}

public void startApp()
{
    form = new Form("Hello World");
    String msg = "Hello World!!!!!!!";
    form.append(msg);
    display = Display.getDisplay(this);
    display.setCurrent(form);
}

public void pauseApp()
{
}

public void destroyApp(boolean unconditional)
{
    notifyDestroyed();
}

Week - 2 Working with J2ME Features:
Working with J2ME Features: Say, creating a Hello World program Experiment with the most basic features and mobile application interaction concepts (lists, text boxes, buttons, radio boxes, soft buttons, graphics, etc)

2.1 Create a program which creates the following kind of menu.
* cut
* copy
* paste
* delete
* select all
* unselect all
2.2 Event Handling.

Create a menu which has the following options:
* cut  - can be on/off
* copy - can be on/off
* paste - can be on/off
* delete - can be on/off
* select all  - put all 4 options on
* unselect all - put all 4 options off

2.3. Input checking
Create an MIDP application which examine, that a phone number, which a user has entered is in the given format.
* Area code should be one of the following: 040, 041, 050, 0400, 044
* There should 6-8 numbers in telephone number (+ area code)
Week - 3 Threads & High Level UI:
3.1. Create a slide show which has three slides, which includes only text. Program should change to the new slide after 5 seconds. After the third slide program returns to the first slide.

3.2 High-level UI
Create a MIDP application, which show to the user 5-10 quiz questions. All questions have 4 possible options and one right option exactly. Application counts and shows to the user how many right answers were right and shows them to user.
3.3 Create a MIDP application, where the user can enter player name and points. The program saves the information to the record using RMS at MIDP device. Program should also print out the top 10 player list to the end user. You can use this class in your game if you made own class for saving and reading record sets.
Week - 4 Working on Drawing and Images

4.1 Create a slide show which has three slides, which includes pictures at PNG format. Program should change to the new slide other 5 seconds.

4.2 Create a MIDP application, which draws a bar graph to the display. Data values can be given at int[] array.
4.3 Create a MIDP application, which draws a bar graph to the display. Data values can be given at int[] array. You can enter four data (integer) values to the input text field.
Creating a Simple Client-Server Application
Create, compile and run a basic UDP-based client-server application.
Creating the Datagram Server project
1) Click on Wireless Toolkit 2.5.2 under the group: All Programs→Sun Java (TM) Wireless Toolkit 2.5.2.
2) Click on 'New Project...' button.
3) Enter project name as 'DatagramServer'. Enter MIDlet name as 'DatagramServer'. Note that the Midlet name is the same as the name of the class in the source code, which extends the MIDlet class, otherwise the application won’t run.
4) Another window pops up where it is required to select a target platform. Select 'MIDP 1.0' from the drop down list.
5) After clicking OK, the project is created; and the Wireless Toolkit tells that the name of the folder where source code files are created. The path of the source code folder is displayed in the debug output window.
Creating and Compiling the DatagramServer source files
The Wireless Toolkit does not come with an IDE by default so Use any IDE or a text editor like Notepad.
1) Create a new text file called DatagramServer.java in the source folder of the project. The exact path of this folder is displayed in the Wireless Toolkit window.
2) Paste contents DatagramServer.java from into the source file.
Running your Server application on the Phone simulator
1) After compiling the project successfully, click on the Run button in the Wireless Toolkit window.
2) A graphical window depicting a phone handset will appear with the name of your application highlighted on its screen as shown below.
3) To start the application, click on the right soft-key (marked with a dot) below the ‘Launch’ command.
4) The phone simulator might ask if it is OK to run the network application. Select ‘Yes’ by clicking on the appropriate soft-key. The server is now up and running.
5) Keep the server running during the creation, compilation and running of the Datagram Client application.

Creating the Datagram Client project
1) Use the same instance of the Wireless Toolkit that is used for creating and compiling the Datagram Server project.
2) Click on 'New Project...' button.
3) A new window pops up. Enter project name as 'DatagramClient'. Enter MIDlet name as 'DatagramClient'. Note that the Midlet name is the same as the name of the class in the source code, which extends the MIDlet class.
4) Another window pops up where one has to select a target platform. Select 'MIDP 1.0' from the drop down list.
5) After clicking OK, the project is created and the Wireless Toolkit tells where to place the source code files. The path of the source code folder is displayed in the debug output window as explained before.

Creating and Compiling the DatagramClient source files
1) Create a new text file called DatagramClient.java in the source folder of the project.
2) Paste contents DatagramClient.java into the source file.
3) Then click on the Build button in the Wireless Toolkit window. If the compilation is OK, it will say Build Complete in the window's debug output window, otherwise it will show the errors. Note: In the source code, use the System.out.println() statement to output debug information to this window.

Running your Client application on the Phone simulator
1) After compiling the project successfully, click on the Run button in the Wireless Toolkit window.
2) A graphical window depicting a phone handset will appear with the name of the application highlighted on its screen.
3) To start the application, click on the right soft-key (marked with a dot) below the ‘Launch’ command.
4) The phone simulator might ask if it is OK to run the network application. Select ‘Yes’ by clicking on the appropriate soft-key. The client is now up and running.
5) When the client executes on the phone simulator, one should see a text box with the caption 'Message'. Enter any message and press the right soft-key (corresponding to Send). If the client-server application is working properly, the screen of the server phone will display the message sent by the client and the client screen will now display a message sent by the server in response. The response message from the server is the original client message in reverse.
6) Try various features of the phone simulator including the different look-and-feel options.

Week - 6 Authentication with a Web Server

6.1 Write a sample program to show how to make a SOCKET Connection from j2me phone.
This J2ME sample program shows how to make a SOCKET Connection from a J2ME Phone. Many times there is a need to connect backend HTTP server from the J2ME application. shows how to make a SOCKET connection from the phone to port 80.

6.2 Login to HTTP Server from a J2ME Program
This J2ME sample program shows how to display a simple LOGIN SCREEN on the J2ME phone and how to authenticate to a HTTP server.
Many J2ME applications for security reasons require the authentication of the user. This free J2ME sample program, shows how a J2ME application can do authentication to the backend server.

Note: Use Apache Tomcat Server as Web Server and Mysql as Database Server.

Week - 7 & 8 Web Application using J2ME
The following should be carried out with respect to the given set of application domains: (Assume that the Server is connected to the well-maintained database of the given domain. Mobile Client is to be connected to the Server and fetch the required data value/information)

- Students Marks Enquiry
- Town/City Movie Enquiry
- Railway/Road/Air (For example PNR) Enquiry/Status
- Sports (say, Cricket) Update
- Town/City Weather Update
- Public Exams (say Intermediate or SSC)/ Entrance (Say EAMCET) Results Enquiry

Divide Student into Batches and suggest them to design database according to their domains and render information according the requests.
(CSE1114) SOFT COMPUTING

UNIT I

UNIT-II

UNIT-III
Unsupervised Learning Networks: Introduction, Fixed Weight Competitive Nets, Kohonen Self-Organizing Feature Maps, Counter Propagation Networks.
Fuzzy Sets: Introduction, Classical Sets, Fuzzy Sets, Classical Relations, Fuzzy Relations

UNIT-IV
Membership functions- Features, Fuzzification, Membership value assignments, Defuzzification Methods, Fuzzy Arithmetic, Fuzzy Measures, Fuzzy Inference Systems, Fuzzy Logic Control Systems

UNIT-V
Genetic Algorithms- Introduction, Basic operators and terminology, Traditional Algorithm vs Genetic Algorithm, Simple GA, General GA, Classification of GA, Genetic Programming, Applications of GA.
Applications of Soft Computing: Internet Search Technique, Hybrid Fuzzy Controllers.

TEXT BOOKS:
REFERENCES:
4. Fuzzy Sets and Fuzzy Logic Theory and Applications – George J.Klir, Bo Yuan
8. Artificial Neural Networks – B.Yegnanarayana.
UNIT – I
Fundamentals of Computer design - Technology trends- cost price and their trends- measuring and reporting performance - quantitative principles of computer design.

UNIT – II
Instruction set principles and examples - Classifying instruction set architecture - memory addressing- type and size of operands- operations in the instruction set- instructions for control flow- encoding an instructionset.

UNIT – III
Instruction level parallelism (ILP) and its dynamic exploitation – Concepts and challenges-overcoming data hazards- reducing branch costs with dynamic hardware prediction – high performance instruction delivery- hardware based speculation ILP software approach- compiler techniques- static branch protection - VLIW approach - H.W support for more ILP at compile time.

UNIT – IV
Memory hierarchy design - review of the ABCs of caches - cache performance-reducing cache misses penalty and miss rate – virtual memory.

Multiprocessors and thread level parallelism - symmetric shared memory architectures- distributed shared memory- Synchronization- multi threading.

UNIT – V
Storage systems - Types - Buses - RAID- errors and failures - designing an I/O system in five easy pieces..

Inter connection networks and clusters - interconnection network media – practical issues in interconnecting networks – clusters- designing a cluster.

TEXT BOOKS

REFERENCES
3. Parallel Computer Architecture, A Hardware / Software Approach, David E. Culler, Jaswinder Pal singh with Anoop Gupta, Elsevier
IV Year B.Tech IT-II Sem L T/P/D C
Elective - III 3 0 3

(ITD1121) INFORMATION RETRIEVAL SYSTEMS

UNIT I
Introduction: Definition, Objectives, Functional Overview, Relationship to DBMS, Digital libraries and Data Warehouses. Information Retrieval System Capabilities, Search, Browse, Miscellaneous.

UNIT II

UNIT III
Document and Term Clustering: Introduction, Thesaurus generation, Item clustering, Hierarchy of clusters. User Search Techniques: Search statements and binding, Similarity measures and ranking, Relevance feedback, Selective dissemination of information search, weighted searches of Boolean systems, Searching the Internet and hypertext.

UNIT IV

UNIT V
Multimedia Information Retrieval, Models and Languages, Data Modeling, Query Languages, Indexing and Searching. Libraries and Bibliographical systems, online IR system, OPACs, Digital Libraries.
TEXTBOOKS
1. Information Storage and Retrieval systems Theory and Implementation Second Edition

REFERENCE BOOKS
3. Modern Information Retrival By Yates Pearson Education.
4. Information Storage & Retrieval By Robert Korfhage – John Wiley & Sons
UNIT I
Introduction to Business Intelligence
Introduction to digital data and its types – structured, semi-structured and unstructured. Introduction to OLTP, OLAP (MOLAP, ROLAP, HOLAP), BI Definitions & Concepts.

UNIT II
Business Intelligence framework
BI Framework Data Warehousing concepts and its role in BI, BI Infrastructure Components – BI Process, BI Technology, BI Roles & Responsibilities, Business Applications of BI, BI best practices

UNIT III
Basics of Data Integration (Extraction Transformation Loading),
Concepts of data integration, needs and advantages of using data integration, introduction to common data integration approaches, Meta data - types and sources, Introduction to data quality, data profiling concepts and applications, introduction to ETL using Pentaho data Integration (formerly Kettle)

UNIT IV
Introduction to Multi-Dimensional Data Modeling
Introduction to data and dimension modeling, multidimensional data model, ER Modeling vs. multi dimensional modeling, concepts of dimensions, facts, cubes, attribute, hierarchies, star and snowflake schema, introduction to business metrics and KPIs, creating cubes using Microsoft Excel

UNIT V
Basics of Enterprise Reporting
A typical enterprise, Malcolm Baldrige - quality performance framework, balanced scorecard, enterprise dashboard, balanced scorecard vs. enterprise dashboard, enterprise reporting using MS Access / MS Excel, best practices in the design of enterprise dashboards
REFERENCES
1. Business Intelligence by David Loshin
2. Business intelligence for the enterprise by Mike Biere
3. Business intelligence roadmap by Larissa Terpeluk Moss, ShakuAtre
4. An introduction to Building the Data Warehouse – IBM
5. Business Intelligence For Dummies – Swain Scheps
6. Successful Business Intelligence: Secrets to making Killer BI Applications by Cindi Howson
7. Information dashboard design by Stephen Few
(ECE1113) DIGITAL IMAGE PROCESSING

UNIT I


UNIT II
Frequency domain methods: Basics of filtering in frequency domain, image smoothing, image sharpening, Selective filtering.

UNIT III
Image Segmentation: Segmentation concepts, Point, Line and Edge Detection, Edge Linking using Hough Transform, Thresholding, Region Based segmentation.
Wavelet based Image Processing: Introduction to wavelet Transform, Continuous wavelet Transform, Discrete wavelet Transform, Filter banks, Wavelet based image compression

UNIT IV
Image Compression: Image compression fundamentals - Coding Redundancy, Spatial and Temporal redundancy, Compression models: Lossy and Lossless, Huffman coding, Arithmetic coding, LZW coding, Run length coding, Bit plane coding, Transform coding, Predictive coding, JPEG Standards.

UNIT V
Morphological Image Processing: Dilation and Erosion, Opening and closing, the hit or miss Transformation, Overview of Digital Image Watermarking Methods
TEXT BOOKS

REFERENCES
UNIT I
UNDERSTANDING CLOUD COMPUTING
Cloud Computing – Companies in the Cloud Today – Cloud Services

UNIT II
DEVELOPING CLOUD SERVICES
Web-Based Application – Pros and Cons of Cloud Service Development – Types of
Cloud Service Development – Software as a Service – Platform as a Service – Web
Services – On-Demand Computing – Discovering Cloud Services Development
Services and Tools – Amazon Ec2 – Google App Engine – IBM Clouds

UNIT III
CLOUD COMPUTING SECURITY ARCHITECTURE
Cloud security fundamentals- Vulnerability assessment tool for cloud- Privacy and
Security in cloud
Cloud computing security architecture: Architectural Considerations- General Issues-
Trusted Cloud computing- Secure Execution Environments and Communications-
Micro-architectures; Identity Management and Access control Identity management-
Access control, Autonomic Security

UNIT IV
CLOUD COMPUTING FOR EVERYONE
Centralizing Email Communications – Collaborating on Schedules – Collaborating on
To-Do Lists – Collaborating Contact Lists – Cloud Computing for the Community –
Collaborating on Group Projects and Events – Cloud Computing for the Corporation

UNIT V
CLOUD COMPUTING CASE STUDIES
Micro soft dynamic CRM- Salesforce.com CRM- App Exchange – Amazon S3 – Oracle
OBIEE
REFERENCES
4. Ronald Krutz Russell Dean Vines, Cloud Security
(ECE1124) EMBEDDED REAL TIME OPERATING SYSTEMS

UNIT I
FUNDAMENTALS OF EMBEDDED SYSTEMS
Definition – Classification of Embedded Systems - Processors in the system - Other Hardware units. Software components - Examples for embedded systems, Design issues and trends

UNIT 2:
EMBEDDED HARDWARE DEVELOPMENT ENVIRONMENT:

UNIT 3:
EMBEDDED SOFTWARE DEVELOPMENT ENVIRONMENT:
Embedded System Development Process, Embedded Operating systems, Types of Embedded Operating systems, Host and Target machines, Linkers/Locators for embedded software, getting embedded software into the target system, Testing on host machine.

UNIT 4:
REAL TIME OPERATING SYSTEMS CONCEPTS -I:
Typical OS structure - RTOS structure - The context of its use - Schedule management for multiple tasks - Scheduling in real time - RTOS task scheduling models – Round Robin, Round Robin with Interrupts, Priority driven - Preemptive and Non-preemptive scheduling

UNIT 5:
REAL TIME OPERATING SYSTEMS CONCEPTS -II:
Tasks and Task states, Tasks and Data, Semaphores and shared data, Message queues, Mailboxes and Pipes, Timer functions, events, Memory management, Interrupt routines in an RTOS environment.
Case study of RTOS using MUCOS. Case study for RTOS based programming - Coding for Automatic Chocolate vending machine using MUCOS.
TEXT BOOKS:
2. Embedded systems - architecture, programming and design - Raj Kamal; Tata McGraw Hill

REFERENCES:
1. Real time Systems”, J. W. S. Liu, Pearson
2. The 8051 Microcontroller & Embedded Systems using Assembly and C by Ayala & Gadre, Cengage Publications
UNIT I

UNIT II
BASIC ELECTRICAL PROPERTIES: Basic Electrical Properties of MOS, CMOS and BiCMOS Circuits:
$I_{DS} - V_{DS}$ relationships, MOS transistor threshold Voltage, $g_m$, $g_{ds}$, figure of merit $w_o$, Pass transistor, NMOS inverter, CMOS Inverter

UNIT III

GATE LEVEL DESIGN AND LAYOUT: Architectural issues, Switch logic networks: Gate logic, Alternate gate circuit: Pseudo-NMOS, Dynamic CMOS logic

UNIT IV
SUBSYSTEM DESIGN: Subsystem Design, Shifters, Adders, ALUs, Multipliers: Array multiplier, Serial-Parallel multiplier, Parity generator, Comparators, Zero/One Detectors, Up/Down Counter.

UNIT V
Array Subsystems: SRAM, DRAM, ROM, Serial Access Memories, Content Addressable Memory

TEXT BOOKS:

REFERENCES:
UNIT I
Basic Concepts & Power Sources
Fundamentals:
Actuators:
Characteristics of activating system, comparison of activating system Hydraulic devices, Pneumatic devices, electric motors, magnetostrictive actuators.

UNIT II
Sensors, Manipulators and Grippers
Sensors: Sensors characteristics, Position sensors, velocity sensors, acceleration sensors, torques sensors, micro switches, lighten infrared sensors, touch and tactile sensors, proximity sensors, range finders.
Manipulators: Construction of Manipulators, Manipulator Dynamic and Force Control, Electronic and Pneumatic manipulators.
Grippers: Robot end effectors

UNIT III
Kinematics & Path Planning
Robots as mechanisms, matrix representation, homogeneous transformation matrices, inverse of transformation of matrices, forward and inverse kinematics of robots, denavit-hartenberg representation of forward kinematics equations of robots, the inverse kinematic solution of robots, inverse kinematic programming of Robots, Jacobian, Differential motions of a frame, interpretation of the differential change, differential changes between frames, differential motions of a robot and its handframe, lagrangian mechanics, effective moments of a inertia, dynamic equations for multiple degree of freedom robot, static force analysis of robots.
UNIT IV
Low level and high level vision
Image acquisition, Illumination Techniques, Imaging Geometry, Some Basic
Relationships between Pixels, Segmentation, Description, Segmentation and
Description of 3-D Structures, Recognition, Interpretation.

UNIT V
Robot Applications
Material Transfer and Machine loading/unloading: General Considerations in
Robot Material Handling, Material Transfer application, Machine loading and unloading.
Liquid handling and pumping.
Processing operations: Spot welding, Continuous Arc Welding, Spray Coating, other
processing operations using Robots,
Assembly and Inspection: Assembly and Robot Assembly automation, Parts
Presentation methods, AsSemby operations, compliance and the Remote Center
Compliance (RCC) Device, Assembly system configuration, Adaptable-Programmable
assembly system, Designing for Robotic Assembly, Inspection Automation.

TEXT BOOKS:
1. Introduction to Robotics, Analysis, System, Applications by Saeed B. Niku.-
   PHI

REFERENCES:
2. I Robotics Technology and Flexible Automation / SR Deb