# GITAM UNIVERSTIY

**(Declared as Deemed to be University U/S 3 of UGC Act, 1956)**

REGULATIONS & SYLLABUS
Of

## B.Tech. (Computer Science &Engineering)

(W.e.f 2012-13 admitted batch)

Gandhi Nagar Campus, Rushikonda
VISAKHAPATNAM – 530 045
Website: www.gitam.edu

**REGULATIONS**
**(W.e.f. 2012-013 admitted batch)**

## 1.0 ADMISSIONS

**1.1 Admissions into B.Tech (Computer Science & Engineering) programme of GITAM University are governed by GITAM University admission regulations.**

## 2.0 ELIGIBILITY CRITERIA

**2.1 A pass in 10+2 or equivalent examination approved by GITAM University with Physics, Chemistry and Mathematics.**

**2.2 Admissions into B.Tech will be based on an All India Entrance Test (GAT) conducted by GITAM University and the rule of reservation, wherever applicable.**

## 3.0 STRUCTURE OF THE B.Tech. PROGRAMME

**3.1 The Programme of instruction consists of:**

**(i) A general core programme comprising Basic Sciences, Basic Engineering, Humanities & Social Sciences and Mathematics.**
**(ii) An engineering core programme imparting to the student the fundamentals of engineering in the branch concerned.**
**(iii) An elective programme enabling the students to take up a group of departmental / interdepartmental courses of interest to him/her.**

**In addition, a student has to**

**(i) carry out a technical project approved by the department and submit a report.**
**(ii) undergo summer training in an industry for a period prescribed by the department and submit a report.**

**3.2 Each academic year consists of two semesters. Every branch of the B.Tech programme has a curriculum and course content (syllabi) for the courses recommended by the Board of Studies concerned and approved by Academic Council.**

## 4.0 CREDIT BASED SYSTEM

**4.1 Each course is assigned certain number of credits which will depend upon the number of contact hours (lectures & tutorials) per week.**

**4.2 In general, credits are assigned to the courses based on the following contact hours per week per semester.**

**One credit for each Lecture / Tutorial hour.**
**One credit for two hours of Practicals.**
**Two credits for three (or more) hours of Practicals.**

**4.3 The curriculum of B.Tech programme is designed to have a total of 190 to 200 credits for the award of B.Tech degree.**

**4.4 Every course of the B Tech programme will be placed in one of the nine groups of courses with minimum credits as listed in the Table 1.**

**4.5 - Table 1: Group of Courses**

| S.No, | Group of Courses | Code | Minimum credits |
|---|---|---|---|
| 1 | Humanities & Social Sciences | HS | 12 |
| 2 | Basic Sciences | BS | 17 |
| 3 | Mathematics | MT | 10 |
| 4 | Basic Engineering | BE | 26 |
| 5 | Core Engineering | CE | 68 |
| 6 | Departmental Elective | DE | 9 |
| 7 | Inter Departmental Elective | IE | 8 |
| 8 | Project Work | PW | 8 |
| 9 | Industrial Training | IT | 2 |
| | Total | | 160 |

**5.0 MEDIUM OF INSTRUCTION**

**The medium of instruction (including examinations and project reports) shall be English.**

**6.0 REGISTRATION**

**Every student has to register himself/herself for each semester individually at the time specified by the Institute / University.**

**7.0 CONTINUOUS ASSESSMENT AND EXAMINATIONS**

**7.1 The assessment of the student's performance in each course will be based on continuous internal evaluation and semester-end examination. The marks for each of the component of assessment are fixed as shown in the Table 2.**

**Table 2: Assessment Procedure**

| S.No. | Component of assessment | Marks allotted | Type of Assessment | Scheme of Examination |
|---|---|---|---|---|
| 1 | Theory | 40 | Continuous evaluation | 1. Best two mid examinations of the three mid examinations for 15 marks each for a total of 30 marks<br>2. Remaining 10 marks are given by the teacher by conducting quiz / assignments / surprises tests etc. |
| | | 60 | Semester-end examination | The semester-end examination in theory courses will be for a maximum of 60 marks. |
| | | 100 | | |
| 2 | Practicals | 100 | Continuous evaluation | (i) 40 marks are allotted for record work and regular performance of the student in the lab.<br>(ii) One examination for a maximum of 20 marks shall be conducted by the teacher handling the lab course at the middle of the semester<br>(iii) One examination for a maximum of 40 marks shall be conducted at the end of the semester (as scheduled by the Head of the Department concerned). |
| 3 | Project work (VII &VIII Semester ) | 100 | Project evaluation | (i) 50 marks are allotted for continuous evaluation of the project work throughout the semester by the guide.<br>(ii) 50 marks are allotted for the presentation of the project work & viva-voce at the end of the semester.* |
| 4 | Industrial Training (Seventh Semester ) | 100 | Industrial training evaluation | (i) 50 marks are allotted for report submission and seminar presentations after completion of the training.<br>(ii) 50 marks are allotted for the viva-voce at the end of the semester.* |
| 5 | Comprehensive Viva ( Sixth Semester) | 100 | Viva-voce | 100 marks are allotted for comprehensive viva to be conducted at the end of programme.*<br>Comprehensive Viva Voce to be conducted in the sixth Semester |

*** Head of the Department concerned shall appoint two examiners for conduct of the examination.**

## 8.0 RETOTALLING, REVALUATION & REAPPEARANCE

**8.1** **Retotaling of the theory answer script of the end-semester examination is permitted on a request made by the student by paying the prescribed fee within ten days of the announcement of the result.**

**8.2** **Revaluation of the theory answer script of the end-semester examination is also permitted on a request made by the student by paying the prescribed fee within fifteen days of the announcement of the result.**

**8.3** **A Student who has secured 'F' Grade in any theory course / Practicals of any semester shall have to reappear for the semester end examination of that course / Practicals along with his / her juniors.**

**8.4** **A student who has secured 'F' Grade in Project work / Industrial Training shall have to improve his report and reappear for viva – voce Examination of project work at the time of special examination to be conducted in the summer vacation after the last academic year.**

## 9.0 SPECIAL EXAMINATION

**9.1** **A student who has completed the stipulated period of study for the degree programme concerned and still having failure grade ('F') in not more than 5 courses ( Theory / Practicals), may be permitted to appear for the special examination, which shall be conducted in the summer vacation at the end of the last academic year.**

**9.2** **A student having 'F' Grade in more than 5 courses (Theory/practicals) shall not be permitted to appear for the special examination.**

## 10.0 ATTENDANCE REQUIREMENTS

**10.1** **A student whose attendance is less than 75% in all the courses put together in any semester will not be permitted to attend the end - semester examination and he/she will not be allowed to register for subsequent semester of study. He /She has to repeat the semester along with his / her juniors.**

**10.2** **However, the Vice Chancellor on the recommendation of the Principal / Director of the University College / Institute may condone the shortage of attendance to the students whose attendance is between 66% and 74% on genuine medical grounds and on payment of prescribed fee.**

## 11.0 GRADING SYSTEM

**11.1** **Based on the student performance during a given semester, a final letter grade will be awarded at the end of the semester in each course. The letter grades and the corresponding grade points are as given in Table 3.**

**Table 3: Grades & Grade Points**

| Grade | Grade points | Absolute Marks |
|---|---|---|
| O | 10 | 90 and above |
| A+ | 9 | 80 – 89 |
| A | 8 | 70 – 79 |
| B+ | 7 | 60 – 69 |
| B | 6 | 50 – 59 |
| C | 5 | 40 – 49 |
| F | Failed, 0 | Less than 40 |

**11.2** **A student who earns a minimum of 5 grade points (C grade) in a course is declared to have successfully completed the course, and is deemed to have earned the credits assigned to that course. However, a minimum of 24 marks is to be secured at the semester end examination of theory courses in order to pass in the theory course.**

## 12.0 GRADE POINT AVERAGE

**12.1** **A Grade Point Average (GPA) for the semester will be calculated according to the formula:**

$$GPA = \frac{\Sigma [ CxG ]}{\Sigma C}$$

**Where**

**C = number of credits for the course,**
**G = grade points obtained by the student in the course.**

**12.2** **Semester Grade Point Average (SGPA) is awarded to those candidates who pass in all the courses of the semester.**

**12.3** **To arrive at Cumulative Grade Point Average (CGPA), a similar formula is used considering the student's performance in all the courses taken in all the semesters completed up to the particular point of time.**

**12.4** **The requirement of CGPA for a student to be declared to have passed on successful completion of the B.Tech programme and for the declaration of the class is as shown in Table 4.**

**Table 4: CGPA required for award of Degree**

| | |
|---|---|
| **Distinction** | **≥ 8.0*** |
| **First Class** | **≥ 7.0** |
| **Second Class** | **≥ 6.0** |
| **Pass** | **≥ 5.0** |

*** In addition to the required CGPA of 8.0, the student must have necessarily passed all the courses of every semester in first attempt.**

## 13.0 ELIGIBILITY FOR AWARD OF THE B.TECH DEGREE

**13.1** **Duration of the programme:**
**A student is ordinarily expected to complete the B Tech. programme in eight semesters of four years. However a student may complete the programme in not more than six years including study period.**

**13.2** **However the above regulation may be relaxed by the Vice Chancellor in individual cases for cogent and sufficient reasons.**

**13.3** **A student shall be eligible for award of the B.Tech degree if he / she fulfills all the following conditions.**

**a) Registered and successfully completed all the courses and projects.**
**b) Successfully acquired the minimum required credits as specified in the curriculum corresponding to the branch of his/her study within the stipulated time.**
**c) Has no dues to the Institute, hostels, Libraries, NCC / NSS etc, and**
**d) No disciplinary action is pending against him / her.**

**13.4** **The degree shall be awarded after approval by the Academic Council.**

**RULES**

1. **With regard to the conduct of the end-semester examination in any of the practical courses of the programme, the Head of the Department concerned shall appoint one examiner from the department not connected with the conduct of regular laboratory work, in addition to the teacher who handled the laboratory work during the semester.**

2. **In respect of all theory examinations, the paper setting shall be done by an external paper setter having a minimum of three years of teaching experience. The panel of paper setters for each course is to be prepared by the Board of Studies of the department concerned and approved by the Academic Council. The paper setters are to be appointed by the Vice Chancellor on the basis of recommendation of Director of Evaluation / Controller of Examinations.**

3. **The theory papers of end-semester examination will be evaluated by internal/external examiner.**

4. **Panel of examiners of evaluation for each course is to be prepared by the Board of Studies of the department concerned and approved by the Academic Council.**
5. **The examiner for evaluation should possess post graduate qualification and a minimum of three years teaching experience.**

6. **The appointment of examiners for evaluation of theory papers will be done by the Vice Chancellor on the basis of recommendation of Director of Evaluation / Controller of Examinations from a panel of examiners approved by the Academic Council.**

VER:01

**SYLLABUS Programme Code: EURCS 200701**

**B.Tech. (CSE) First Semester**

| Course Code | Subject | Category | Marks | | | Hours per week | | | | Credits to be awarded |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Semester End Exam | Con. Eval. | Total | L | T | P | Total | |
| EUREG 101 | Engg. English – I | HS | 60 | 40 | 100 | 3 | - | | 3 | 3 |
| EURMT 102 | Engg. Mathematics | MT | 60 | 40 | 100 | 4 | - | | 4 | 4 |
| EURPH 103 | Engg. Physics - I | BS | 60 | 40 | 100 | 4 | - | | 4 | 4 |
| EURCH 104 | Engg. Chemistry – I | BS | 60 | 40 | 100 | 4 | - | | 4 | 4 |
| EURCS 105 | Programming with C | BE | 60 | 40 | 100 | 3 | - | | 3 | 3 |
| EURCS 113 | Programming with C Lab | BE | - | 100 | 100 | - | - | 3 | 3 | 2 |
| EURCH 114/214 | Engg. Chemistry Lab | BS | - | 100 | 100 | - | - | 3 | 3 | 2 |
| EUREE 118/218 | Electrical & Electronics Lab | BE | - | 100 | 100 | - | - | 3 | 3 | 2 |
| | Total: | | 300 | 500 | 800 | 18 | - | 09 | 27 | 24 |

**B.Tech. (CSE) Second Semester**

| Course Code | Subject | Category | Marks | | | Hours per week | | | | Credits to be awarded |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Semester End Exam | Con. Eval. | Total | L | T | P | Total | |
| EUREG 201 | Engg. English – II | HS | 60 | 40 | 100 | 3 | - | | 3 | 3 |
| EURMT 202 | Higher Engineering Mathematics – I | MT | 60 | 40 | 100 | 3 | - | | 3 | 3 |
| EURMT 203 | Higher Engineering Mathematics – II | MT | 60 | 40 | 100 | 3 | - | | 3 | 3 |
| EURPH 204 | Engg. Physics - II | BS | 60 | 40 | 100 | 3 | - | | 3 | 3 |
| EURCH 205 | Engg. Chemistry – II | BS | 60 | 40 | 100 | 3 | - | | 3 | 3 |
| EURCS 206 | Object Oriented programming with C+ + | BE | 60 | 40 | 100 | 3 | - | - | 3 | 3 |
| EURPH 212/112 | Engg. Physics Lab | BS | - | 100 | 100 | - | - | 3 | 3 | 2 |
| EURCS 213 | Object oriented programming with C++ Lab | BE | - | 100 | 100 | - | - | 3 | 3 | 2 |
| EURME 215/115 | Engineering Graphics Practice | BE | - | 100 | 100 | - | - | 3 | 3 | 2 |
| | Total: | | 360 | 540 | 900 | 18 | - | 09 | 27 | 24 |

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**B.Tech. (CSE) Third Semester**

| Course Code | Subject | Category | Marks | | | Hours per week | | | | Credits to be awarded |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Semester End Exam | Con. Eval. | Total | L | T | P | Total | |
| EURCS 301 | Fundamentals of Electronics and Electrical Circuits | BE | 60 | 40 | 100 | 3 | 1 | - | 4 | 4 |
| EURCS 302 | Probability and Statistics | MT | 60 | 40 | 100 | 3 | - | - | 3 | 3 |
| EURCS 303 | Discrete mathematical Structures | CE | 60 | 40 | 100 | 3 | - | - | 3 | 3 |
| EURCS 304 | Data Structures | CE | 60 | 40 | 100 | 3 | 1 | - | 4 | 4 |
| EURCS 305 | Switching Theory and Logic Circuits | CE | 60 | 40 | 100 | 3 | - | - | 3 | 3 |
| EURCS 311 | Data Structures Lab | CE | - | 100 | 100 | - | - | 3 | 3 | 2 |
| EURCS 312 | Electrical & Electronics Lab | BE | - | 100 | 100 | - | - | 3 | 3 | 2 |
| EURCS 313/ EURIT 313 | Advanced Communication Skills and English Language Lab | HS | - | 100 | 100 | | | 4 | 4 | 2 |
| Total | | | 300 | 500 | 800 | 15 | 02 | 10 | 27 | 23 |

**B.Tech (CSE)Fourth Semester**

| Course Code | Subject | Category | Marks | | | Hours per week | | | | Credits to be awarded |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Semester End Exam | Con. Eval. | Total | L | T | P | Total | |
| EURCS 401/ EURIT 401 | Computer Organization | CE | 60 | 40 | 100 | 3 | 1 | - | 4 | 4 |
| EURCS 402/ EURIT 402 | Environmental studies | HS | 60 | 40 | 100 | 3 | 1 | - | 4 | 4 |
| EURCS 403 | Programming with JAVA | BE | 60 | 40 | 100 | 3 | 1 | - | 4 | 4 |
| EURCS 404 | Operating Systems | CE | 60 | 40 | 100 | 3 | - | - | 3 | 3 |
| EURCS 405/ EURIT 405 | Software Engineering | CE | 60 | 40 | 100 | 3 | 1 | - | 4 | 4 |
| EURCS 411 | Programming with JAVA Lab | BE | - | 100 | 100 | - | - | 3 | 3 | 2 |
| EURCS 412 | Operating Systems Lab | CE | - | 100 | 100 | - | - | 3 | 3 | 2 |
| EURCS 413 | Computer Engineering Workshop | CE | - | 100 | 100 | - | - | 3 | 3 | 2 |
| Total | | | 300 | 500 | 800 | 15 | 04 | 09 | 27 | 25 |

| Course Code | Subject | Category | Marks | | | Hours per week | | | | Credits to be awarded |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Semester End Exam | Con. Eval. | Total | L | T | P | Total | |
| EURCS 501 | Advanced Computer Architecture | CE | 60 | 40 | 100 | 3 | 1 | - | 4 | 4 |
| EURCS 502/ EURIT 502 | Object Oriented Analysis & Design | CE | 60 | 40 | 100 | 3 | - | - | 3 | 3 |
| EURCS 503/ EURIT 503 | Data Base Management Systems | CE | 60 | 40 | 100 | 3 | - | - | 3 | 3 |
| EURCS 504 | Formal Languages & Automata Theory | CE | 60 | 40 | 100 | 3 | 1 | - | 4 | 4 |
| EURCS 505 | Computer Networks | CE | 60 | 40 | 100 | 3 | 1 | - | 4 | 4 |
| EURCS 511 | Computer Networks Lab | CE | - | 100 | 100 | - | - | 3 | 3 | 2 |
| EURCS 512 | DBMS Laboratory | CE | - | 100 | 100 | - | - | 3 | 3 | 2 |
| EURCS 513 | Personality Development | CE | - | 100 | 100 | - | - | 3 | 3 | 2 |
| Total | | | 300 | 500 | 800 | 15 | 03 | 09 | 27 | 24 |

**B.Tech. (CSE)Fifth Semester**

**B.Tech. (CSE) Sixth Semester**

| Course Code | Subject | Category | Marks | | | Hours per week | | | | Credits to be awarded |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Semester End | Con. Eval. | Total | L | T | P | Total | |
| EURCS 601 | Language Processors | CE | 60 | 40 | 100 | 3 | 1 | - | 4 | 4 |
| EURCS 602 | Design and Analysis of Algorithms | CE | 60 | 40 | 100 | 3 | 1 | - | 4 | 4 |
| EURCS 603 | Managerial Economics | HS | 60 | 40 | 100 | 3 | - | - | 3 | 3 |
| EURCS 604/ EURIT 604 | Web Technologies | CE | 60 | 40 | 100 | 3 | - | - | 3 | 3 |
| EURCS 605 | Computer Graphics and Multimedia | CE | 60 | 40 | 100 | 3 | - | - | 3 | 3 |
| EURCS 606 | AI & Machine Learning | CE | 60 | 40 | 100 | 3 | 1 | - | 4 | 4 |
| EURCS 611 | Language Processors Lab | CE | - | 100 | 100 | | | 3 | 3 | 2 |
| EURCS 612 | Web Technologies Lab | CE | - | 100 | 100 | | | 3 | 3 | 2 |
| EURCS 614 | Comprehensive Viva | CE | - | 100 | 100 | | | | | 2 |
| Total | | | 300 | 600 | 900 | 18 | 03 | 06 | 27 | 27 |

**B.Tech. (CSE)Seventh Semester**

| Course Code | Subject | Category | Marks | | | Hours Per Week | | | | Credits to be awarded |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Semester End Exam | Con. Eval. | Total | L | T | P | Total | |
| EURCS 701 | Embedded Systems | CE | 60 | 40 | 100 | 3 | - | - | 3 | 3 |
| EURCS 702 | Data Warehousing and Data Mining | CE | 60 | 40 | 100 | 3 | 1 | - | 4 | 4 |
| EURCS 703 | Mobile Communications | CE | 60 | 40 | 100 | 3 | 1 | | 4 | 4 |
| EURCS 721/725 | Departmental Elective I | DE | 60 | 40 | 100 | 3 | 1 | - | 4 | 4 |
| EURCS 751/7510 | Inter Departmental Elective I | IE* | 60 | 40 | 100 | 3 | 1 | - | 4 | 4 |
| EURCS 711 | Embedded Systems Lab | CE | - | 100 | 100 | - | - | 3 | 3 | 2 |
| EURCS 712 | Project Phase-I | PW | - | 100 | 100 | - | - | 6 | 6 | 3 |
| EURCS 713 | Industrial Training | IT | - | 100 | 100 | - | - | - | - | 2 |
| Total | | | 300 | 500 | 800 | 15 | 04 | 09 | 28 | 26 |

**B.Tech. (CSE) Eighth Semester**

| Course Code | Subject | Category | Marks | | | Hours Per Week | | | | Credits to be awarded |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Semester End Exam | Con. Eval. | Total | L | T | P | Total | |
| EURCS 821/826 | Departmental Elective – II | DE | 60 | 40 | 100 | 3 | 1 | - | 4 | 4 |
| EURCS 831/836 | Departmental Elective – III | DE | 60 | 40 | 100 | 3 | 1 | - | 4 | 4 |
| EURCS 851/8510 | Inter Departmental Elective – II | IE* | 60 | 40 | 100 | 3 | 1 | - | 4 | 4 |
| EURCS 811 | Software Development Lab | CE | - | 100 | 100 | - | - | 3 | 3 | 2 |
| EURCS 812 | Project Phase-II | PW | 50 | 50 | 100 | - | - | 10 | 10 | 5 |
| EURCS 813 | Seminars | CE | - | 100 | 100 | - | - | - | - | 2 |
| Total | | | 230 | 370 | 600 | 09 | 03 | 13 | 25 | 21 |

**** Inter Departmental Elective will be from other departments. The list of courses that would be offered by the department in any semester will be notified from which the student may select a course.**

**B.Tech. (CSE)**
**ELECTIVES**

| Department Elective-I | |
|---|---|
| **Course Code** | **Name of the Elective** |
| **EURCS721** | **Cryptography and Network Security** |
| **EURCS722** | **Image Processing and Pattern Recognition** |
| **EURCS723** | **Soft Computing** |
| **EURCS724** | **Distributed Systems** |
| **EURCS725** | **Design Patterns** |

| Department Elective-II | |
|---|---|
| **Course Code** | **Name of the Subject** |
| **EURCS821** | **Cloud Computing** |
| **EURCS822** | **Web Services** |
| **EURCS823** | **Neural Networks** |
| **EURCS825** | **Network Management** |
| **EURCS826** | **Adhoc &Sensor Networks** |

| Department Elective – III | |
|---|---|
| **Course Code** | **Name of the Elective** |
| **EURCS831** | **Social Network Analysis** |
| **EURCS832** | **Open Source Software Development** |
| **EURCS833** | **Game Programming** |
| **EURCS834** | **Bio Informatics** |
| **EURCS835** | **Data Analytics** |
| **EURCS836** | **Performance Evaluation ofComputer Systems** |

| Interdepartmental Elective-I | | Interdepartmental Elective-II | |
|---|---|---|---|
| **EURCS 751** | **Remote Sensing & Geo Graphic Information Systems** | **EURCS 851** | **Industrial Electronics** |
| **EURCS 752** | **System Modeling & Simulation** | **EURCS 852** | **Computer Aided Design** |
| **EURCS 753** | **Bio-Medical Instrumentation** | **EURCS 853** | **Robotics & Automation** |
| **EURCS 754** | **Power Electronics** | **EURCS 854** | **Mechatronics** |
| **EURCS 755** | **Project Planning & Management** | **EURCS 855** | **Thermodynamics** |
| **EURCS 756** | **Introduction to Micro Electro Mechanical Systems (MEMS)** | **EURCS 856** | **Digital Signal Processing** |
| **EURCS 757** | **Entrepreneurship** | **EURCS 857** | **Electronic Measurement & Instrumentation** |
| **EURCS 758** | **Public Administration** | **EURCS 858** | **Very Large Scale Integrated System Design (VLSI)** |
| **EURCS 759** | **Fundamentals of Communication Engineering** | **EURCS 859** | **Fundamentals of Civil Engineering** |
| **EURCS 7510** | **Equipment in Construction Industry** | **EURCS 8510** | **Engineering Materials** |

**B.Tech. (CSE)**

| S.No. | Category | Code | Allocated Credits |
|---|---|---|---|
| 01. | Humanities & Social Sciences | HS | 15 |
| 02 | Basic Sciences | BS | 18 |
| 03. | Mathematics | MT | 13 |
| 04. | Basic Engg. | BE | 26 |
| 05. | Core Engg. | CE | 92 |
| 06. | Departmental Electives | DE | 12 |
| 07. | Inter-Departmental Elective | IE | 08 |
| 08. | Project Work | PW | 08 |
| 09. | Industrial Training | IT | 02 |
| Total | | | 194 |

**B.Tech. (CSE) First Semester**
**ENGINEERING ENGLISH-I**

**Code: EUREG 101** **Category: HS**
**Credits: 3** **Hours: 3 per week**
**Department: CSE**

**Unit – I:**

**Introduction to Communication:** Role and Importance of Communication, Features of Human Communication, Process of Communication, Types of Communication: Verbal and Non-Verbal Importance of Listening in Effective Communication, Barriers to Communication

**Unit – II:**

**Effective Vocabulary:** Words Often Confused, One-word Substitutes, Idiomatic Usage, Using Dictionary and Thesaurus

**Unit – III:**

**Functional Grammar**: Functions: Making proposals, Offering suggestions, Apologizing, Requesting, Offering and Refusing help, Giving and asking for information, Making complaints, Interrupting, Giving and asking directions, Inviting, Asking Permission, Expressing ability, etc., Articles, Prépositions, Tenses , Concord

**Unit – IV:**

**Communication through Writing:** Paragraph writing, Communication through letters: official and personal letters, letters of complaint, letters of enquiry and responses. Résumé writing, Cover letters, E-mail etiquette, Punctuation

**Unit – V:**

**Reading for Enrichment:** Sachin Tendulkar, Michael Jackson

**Text Books:**

1. E. Suresh Kumar et al., Enriching Speaking and Writing Skills, Orient Blackswan, 2012.

**Reference Books:**

1. E. Suresh Kumar et al., Communication Skills and Soft Skills, Pearson, 2010.
2. Jayashree Mohanraj et al., Speak Well, Orient Black Swan, 2011.
3. Oxford Advanced Learners' Dictionary, 2010 Edition.

**B.Tech. (CSE) First Semester**
**ENGINEERING MATHEMATICS**

**Code: EURMT 102** **Category: MT**
**Credits: 4** **Hours: 4 per week**
**Department: CSE**

**Unit-I:**

**First order Differential Equations**

Formation – Variables separable – Homogeneous, non-Homogeneous, Linear and Bernoulli equations. Exact equations - Applications of first order differential equations – Orthogonal Trajectories, Newton's law of cooling, law of natural growth and decay.

**Unit-II:**

**Higher order Differential Equations**

Complete solutions - Rules for finding complementary function - Inverse operator - Rules for finding particular integral - Method of variation of parameters - Cauchy's and Legendre's linear equations - Simultaneous linear equations with constant coefficients - Applications of linear differential equations to Oscillatory Electrical circuits L-C, LCR – Circuits - Electromechanical Analogy.

**Unit-III:**

**Mean Value Theorems**

Rolle's, Lagrange's and Cauchy's mean value theorems. Taylor's and Maclaurin's theorems and applications (without proofs).

**Unit-IV:**

**Infinite Series**

Definitions of convergence, divergence and oscillation of a series - General properties of series - Series of positive terms - Comparison tests - Integral test - D' Alembert's Ratio test - Raabe's test - Cauchy's root test - Alternating series - Leibnitz's rule - Power series - Convergence of exponential, Logarithmic and binomial series (without proofs).

**Unit-V:**

**Linear Algebra**

Rank of a Matrix – Elementary Transformations – Echelon form - Normal form (self-study). Consistency of Linear system of equations $A X = B$ and $A X = 0$. Eigen Values and Eigen Vectors – Properties of Eigen values(without proofs) – Cayley – Hamilton theorem (Statement only without proof) – Finding inverse and powers of a square matrix using Cayley – Hamiton theorem – Reduction to diagonal form – Quadratic form - Reduction of Quadratic form into canonical form – Nature of quadratic forms.

**Text Books:**

1. Higher Engineering Mathematics, Dr.B.S Grewal,Khanna Publishers.
2. Engineering Mathematics Vol.-1,Dr.T.K.V.Iyengar,S.Chand.

**Reference Books:**

1. Advanced Engineering Mathematics, Erwin Kreyszig,Wiley Eastern Pvt. Ltd.
2. Textbook of Engineering Mathematics, N.P.Bali. ,Laxmi Publications (P) Ltd.
3. Higher Engineering Mathematics, Dr.M.K.Venkata Raman.,National Pub. Co.
4. Calculus and Analytic Geometry,Thomas / Finney, Sixth edition -Narosa Publishing House

**B.Tech. (CSE) First Semester**
**ENGINEERING PHYSICS – I**

**Code: EURPH 103** **Category: BS**
**Credits: 4** **Hours: 4 per week**
**Department: CSE**

**Unit-I:**

**THERMODYNAMICS:** Heat and Work – First law of Thermodynamics and Applications – Reversible and Irreversible Processes – Carnot's Cycle and Efficiency – Second Law of Thermodynamics – Carnot's Theorom - Entropy – Entropy in Reversible and Irreversible Processes – Entropy and Second Law – Entropy and Disorder – Third Law of Thermodynamics.

**Unit-II:**

**ELECTROMAGNETIC OSCILLATIONS AND ALTERNATING CURRENTS:** Energy stored in a capacitor and an Inductor – LC Oscillations (Qualitative and Quantitative) – Analogy to Mechanical Motion – Damped Oscillations – Damped Oscillations in an RLC circuit – Alternating Current (Including Equations for Voltages and Currents) – Fundamental Definitions – (Cycle, Time Period, Frequency, Amplitude, Phase, Phase Difference, Root Men Square (RMS) Value, Average Value, Form Factor, Quality Factor, Power in Alternating Current Circuits) – Forced Oscillations and Resonance – The Series RLC Circuit.

**ELECTROMAGNETIC WAVES:** Induced Magentic Fields – Displacement Current – Maxwell's Equations – Travelling Waves and Maxwell's Equations – The Poyinting Vector – Light and the Electromagnetic Spectrum.

**Unit-III:**

**DIELECTRIC PROPERTIES:** Introduction – Fundamental Definitions – Local Field – Claussius-Mossotti Relation – Different Types of Electric Polarizations (electronic, ionic, and dipolar polarizations) – Frequency and Temperature Effects on Polarization – Dielectric Loss- Dielectric Breakdown – Determination of Dielectric Constant – Properties and Different Types of Insulating Materials – Ferroelectric Materials – Spontaneous Polarization in BaTiO3-Electrets

**Unit-IV:**

**MAGNETIC PROPERTIES**: Introduction – Fundamental Definitions – Different Types of Magnetic Materials – Weiss Theory of Ferromagnetism – Domain Theory of Ferromagnetism – Hysterisis – Hard and Soft Magnetic Materials – Ferrites – Microwave Applications – Magnetic Bubbles.

**Unit-V:**

**SUPERCONDUCTIVITY:** Introduction – BCS Theory – Meissner Effect – Properties of Superconductors – Type-I and Type-II Superconductors – High TC Superconductors – Applications.
**ULTRASONICS**: Introduction – Production of Ultrasonics by Magnetorestriction and Piezo-electric effects – Detection and Applications of Ultrasonics.

**Text Books:**

1. Physics Part I & Part II Engineering, Physics. Resnick, Halliday, Krane, John, Wiley & Sons.
2. P.K. Palani Samy, Scitech Publications (India) Pvt. Ltd. , Chennai.

**Reference Books:**

1. Heat, Thermodynamics, and Statistical Physics, Agarwal, Singhal, Satya Prakash, Pragati Prakashan, Meerut.
2. Solidstate Physics, S.O. Pillai, New Age International (P) Limited, New Delhi.
3. Materials Science, M. Arumugam. Anuradha Agencies, Kumbhakonam.
4. A Textbook of Engg. Physics, Kshirsagar & Avadhanulu, S. Chand and Co. Addison-Wesley. The Feynman Lectures on Physics

**B.Tech. (CSE)First Semester**
**ENGINEERING CHEMISTRY-I**

**Code: EURCH 104** **Category: BS**
**Credits: 4** **Hours: 4 per week**
**Department: CSE**

**Unit – I:**

**WATER TECHNOLOGY - SOURCES AND PURIFICATION OF WATER:**
Sources of Water – Impurities in Water- Hardness of Water – Temporary and Permanent Hardness-Units. Municipal Water treatment- Sedimentation – Coagulation–Filtration-Sterilisation - Desalination of Brackish Water - Reverse Osmosis and Electrodialysis.

**Unit – II:**

**WATER TECHNOLOGY-SOFTENING METHODS AND BOILER TROUBLES:**

Industrial Water treatment- Lime - Soda Ash Method - Chemical reactions –Problems - Zeolite and Ion exchange processes. Boiler Troubles – Boiler corrosion- Scale and Sludge formation - Caustic Embrittlement-Priming and Foaming – Internal conditioning methods like – phosphate, carbonate conditioning.

**Unit – III:**

**SURFACE CHEMISTRY AND NANOCHEMISTRY:**

Colloids: Types of Colloids – Preparation of Colloidal solutions – Micelles – Applications of Colloids
Adsorption : Classification – Adsorption of Gasses on solids - Applications of Adsorption
Nanochemistry : Introduction – Wet chemical methods of preparation ( Microemulsion – Solvent Extraction Reduction – Chemical Oxidation / Reduction).

**Unit – IV:**

**POLYMERS:**

Types of Polymerization– Mechanism of addition polymerization-Moulding constituents and Moulding techniques. Differences between Thermo Plastic and Thermosetting Resins. Preparation and Properties of Polyethylene, PVC, Polystyrene, Polyamides (Nylon-6:6), Polycarbonates and Bakelite - Engineering applications of Plastics, Poly Siloxanes, Polyphosphines.

**Unit – V:**

**ENGINEERING MATERIAL SCIENCE:**

Refractories:– Classification - criteria of a good refractory. Preparation and properties of silica, magnesite and silicon carbide refractories - clay bond, silica nitride bond and self bond in silicon carbide.
Glass: – Manufacture of glass – types of glasses- Soft glass – hard glass and pyrex glass.
Ceramics: – Structural clay products, white wares and Chemical stone wares.
Cement: Chemical composition of Portland cement, Manufacture- Setting and Hardening of Cement.

**Text Books:**

1. Engineering Chemistry, P.C. Jain and M. Jain. Dhanapat Rai & Sons, Delhi.
2. Engineering Chemistry, B.K.Sharma.Krishna Prakashan, Meerut.
3. A Textbook of Engineering Chemistry, Sashi Chawla. Dhanapath Rai & Sons, Delhi.
4. Text Book of NanoScience and NanoTechnology , by B.S. Murthy and P.Shankar, University Press.

**Reference Books:**

1. A Textbook of Engineering Chemistry, S.S.Dara. ,S.Chand & Co. New Delhi.
2. MaterialScienceandEngineering,V.Raghavan,Prentice-HallIndia,Ltd.

**B.Tech. (CSE)First Semester**
**PROGRAMMING with C**

**Code: EURCS 105** **Category: BE**
**Credits: 3** **Hours: 3 per week**
**Department: CSE**

**UNIT – I**
Algorithm, flowchart, program development steps, structure of C program, Compilers, Linker, Preprocessor, identifiers, basic data types and sizes, Constants, variables, operators, expressions, type conversions, conditional expressions, precedence and order of evaluation. Input-output statements, statements and blocks, programming examples.

**UNIT – II**
**Control Structures:** if and switch statements, loops- while, do-while and for statements, break, continue, goto and labels.
Designing structured programs, Functions, basics, parameter passing, block structure, user defined functions, standard library functions, recursive functions, Comparison of Iteration and Recursion, header files, C preprocessor, storage classes- extern, auto, register, static, scope rules, example c programs.

**UNIT – III**
**Arrays:** concepts, declaration, definition, accessing elements, storing elements, arrays and functions, two-dimensional and multi-dimensional arrays, applications of arrays.
**Pointers:** concepts, initialization of pointer variables, pointers and function arguments, address arithmetic, Character pointers and functions, pointers to pointers, pointers and multidimensional arrays, dynamic memory management functions, command line arguments, c program examples.

**UNIT – IV**
**Strings:** What are Strings, Arrays of Strings and Standard Library String Functions.
**Derived types:** structures- declaration, definition and initialization of structures, accessing structures, nested structures, arrays of structures, structures and functions, pointers to structures, self referential structures, unions, typedef, bitfields, C program examples.

**UNIT – V**
**Input and output -** concept of a file, , File Structure , text files and binary files, streams, standard I/O, Formatted I/O, file I/O operations, error handling, C program examples.

**Text Book:**

1. Computer science, A structured programming approach using C, B.A. Forouzan and R.F. Gilberg, Third edition, Thomson.

**Reference Books:**

1. Programming with ANSI and Turbo C by Ashok N. Kamthane, published by PEARSON Education
2. MASTERING C, byK R Venugopal, S R Prasad published by Tata McGraw Hill.
3. Let us C by Yashwant Kanetkar, published by BPB Publications.

**B.Tech. (CSE) First Semester**
**PROGRAMMING WITH C LAB**

**Code: EURCS 113** **Category: BE**
**Credits: 2** **Hours: 3 per week**
**Department: CSE**

1. a) Write a C program to ask the user to enter one char ( Upper-Case letter) check whether user entered a Upper-case letter or not(by using relational and logical operators) and then if user has entered a Upper-case letter convert into a Lower-case letter? ( hint: Upper-case means capital letters, use ASCII information to check for Upper-case and convert)

b) Write a C program to ask the user to enter two integers and apply all arithmetic operations on those print the corresponding values?(hint : +,-,*,/,%)

c) Write a C program to Determine the ranges of char, short, int and long int variables both signed and Unsigned

By using sizeof operator(ii) By printing appropriate values from standard header (limits.h )

2. a) Write a Program to Find the Roots of a Quadratic Equation using if else and Switch statements.
b) Write a Program which Generates One Hundred Random Integers in the Range of 1 To 100, store them in an array and then prints the average. Write three versions of the program using Different Loop Constructs.

3. a) Write a C program to find the sum of individual digits of a positive integer.
b) A Fibonacci Sequence is defined as follows: the first and second terms in the sequence are 0 and 1. Subsequent terms are found by adding the preceding two terms in the sequence. Write a C program to generate the first n terms of the sequence.
c) Write a C program to calculate the following

$$Sum=1-x^2/2! +x^4/4!-x^6/6!+x^8/8!-x^{10}/10!$$

4. a) Write a C program to generate all the prime numbers between 1 and n, where n is a value supplied by the user.

b)Write C programs that use both recursive and non-recursive functions
i) To find the factorial of a given integer.
ii) To find the GCD (greatest common divisor) of two given integers.
iii) To solve Towers of Hanoi problem.

5. a) Write a C program to find both the largest and smallest number in a list of integers.
b) Write a program to read set of elements in the array and sort them in ascending order.
c) Write a C program that uses functions to perform the following:
i) Addition of Two Matrices
ii) Multiplication of Two Matrices
iii) Transpose of a given Matrix

6. a) Write a C program that uses functions to perform the following operations:
i) To insert a sub-string in to given main string from a given position.
ii) To delete n Characters from a given position in a given string.
b) Write a C program to determine if the given string is a palindrome or not
c) Given an Array of Strings Write a Program to Sort the String in Dictionary Order.

7. Write a C program that uses functions to perform the following operations:
i) Reading a complex number
ii) Writing a complex number
iii)Addition of two complex numbers

8. Write a C program that uses functions to perform the following operations:
a)Count number of characters, words in a file.
b) Write a C program to reverse the first n characters in a file.
(Note: The file name and n are specified on the command line.)
c) Write a C program which copies one file to another.

9. Write aprogram to print the details of employees of a organization like(Name, DateOfJoin, Salary) using nested structures

10. Construct a program for managing membership of library using structures. Write a program that accepts the ,code number and duration of books borrowed and displays the name and other information of all those members having dues.

**B.Tech. (CSE) First Semester**
**ENGINEERING CHEMISTRY LAB**

**Code: EURCH 114/214** **Category: BS**
**Credits: 2** **Hours: 3 per week**
**Department: CSE**

The objective of the Laboratory Practicals is to make the student to acquire the basic Concepts on Engineering Chemistry.

1. Calibration of Volumetric Apparatus.
2. Determination of sodium carbonate in soda ash.
3. Estimation of Iron as Ferrous Iron in an Ore Sample.
4. Estimation of Calcium on Portland cement.
5. Estimation of volume strength of Hydrogen Peroxide.
6. a) Estimation of Active Chlorine Content in Bleaching Power.
   b) Determination of Hardness of a Ground Water Sample.
7. Determination of Chromium (VI) in Potassium Dichromate
8. Determination of Copper in a Copper Ore.
9. a) Determination of Viscosity of a Liquid.
   b) Determination of Surface Tension of a Liquid.
10. a) Determination of Mohr's Salt by potentiometric method.
    b) Determination of Strength of an acid by pH metric method.

**B.Tech. (CSE) First Semester**
**ELECTRICAL & ELECTRONICS WORKSHOP**

**Code: EUREE 118/218** **Category: BE**
**Credits: 2** **Hours: 3 per week**
**Department: CSE**

**List of Experiments**

| | |
|---|---|
| 1. | a. Study of Electrical Symbols<br>b. Study of Electrical Components |
| 2. | a. One way Control of a Lamp<br>b. Two way Control of a Lamp |
| 3. | A Lamp controlled from three different places |
| 4. | Study of Cathode Ray Oscilloscope & Signal Generator |
| 5. | Study of Electronics Components with Symbols |
| 6 | Tube Light wiring |
| 7 | Bread Board connections |
| 8 | Half Wave Diode Rectifier |
| 9 | Living Room wiring |
| 10 | Godown wiring |
| 11 | Verification of OHMS law |
| 12 | Soldering & De – Soldering Techniques & Precautions |
| 13 | Fan wiring |
| 14 | Doctors Room wiring |
| 15 | Series & Parallel Connections of Lamps ( Dim & Bright connections ) |
| 16 | PCB Design |

**B.Tech. (CSE)Second Semester**
**ENGINEERING ENGLISH-II**

**Code: EUREG 201** **Category: HS**
**Credits: 3** **Hours: 3 per week**
**Department: CSE**

**Unit – I :**

**Interpersonal Communication:**

Introduction to Interpersonal Communication, Models of Interpersonal Relationship Development, Team Work, Persuasion Techniques

**Unit – II:**

**Spoken Communication:**

Importance of spoken communication, Basics of Spoken English

Situational Dialogues, Speech Making: Formal and Informal

**Unit – III :**

**Developing Vocabulary and Correcting Common Errors:**

Homonyms, Homophones and Homographs, Synonyms and Antonyms

Oral and Written

**Unit – IV:**

**Information Transfer:**

Using charts, Figures, Tables, Pictograms, Maps, Note Making

Note Taking

**Unit – V:**

**Reading for Enrichment**

Sir Mokshagundam Visvesvaraya

Steve Jobs: The Early Years

**Text Book:**

1. E. Suresh Kumar et al., Communication for Professional Success, Orient Blackswan, 2012.

**Reference Books:**

1. E. Suresh Kumar et al., Communication Skills and Soft Skills, Pearson, 2010.
2. Jayashree Mohanraj et al., Speak Well, Orient Black Swan, 2011.
3. Oxford Advanced Learners' Dictionary, 2010 Edition.

**B.Tech. (CSE) Second Semester**
**HIGHER ENGINEERING MATHEMATICS – I**

**Code: EURMT202** **Category: MT**
**Credits: 3** **Hours: 3 per week**
**Department: CSE**

**Unit-I:**

**Partial Differentiation-1**

Introduction to Partial differentiation - Total derivative - Differentiation of implicit functions - Geometrical interpretation - Tangent plane and normal to a surface - Change of variables - Jacobians.

**Unit-II:**

**Partial differentiation-2**

Taylor's theorem for functions of two variables. Total differential - Maxima and minima of functions of two variables - Lagrange's method of undetermined multipliers - Differentiation under the integral sign, Leibnitz's Rule.

**Unit-III:**

**Fourier Series**

Euler's formulae - Conditions for a Fourier expansion - Functions having points of discontinuity - Change of interval - Odd and even functions - Expansions of odd or even periodic functions - Half range series and practical Harmonic Analysis.

**Unit-IV:**

**Partial differential equations**

Formation of partial differential equations - Solutions of a partial differential equation - Equations solvable by direct integration - Linear equations of the first order - Non-linear equations of the first order - Homogeneous linear equations with constant coefficients - Rules for finding the complementary function - Rules for finding the particular integral.

**Unit-V:**

**Applications of Partial Differential Equations**

Method of separation of variables – partial differential equations – wave equation – one dimensional heat flow – two-dimensional heat flow-solution of Laplace equation –Laplace equation in polar co-ordinates.

**Text Books:**

1. *Higher Engineering Mathematics,*Dr.B.S Grewal,Khanna Publishers.
2. *Engineering Mathematics Vol.-1,Dr.T.K.V.Iyengar,S.Chand.*

**References :**

1. *Advanced Engineering Mathematics,* Erwin Kreyszig. Wiley Eastern Pvt. Ltd.
2. *Textbook of Engineering Mathematics,* N.P.Bali. , Laxmi Publications (P) Ltd.
3. *Higher Engineering Mathematics,* Dr.M.K.Venkata Raman. National Pub. Co.

**B.Tech. (CSE) Second Semester**

**HIGHER ENGINEERING MATHEMATICS – II**

**Code: EURMT203** **Category: MT**
**Credits: 3** **Hours: 3 per week**
**Department: CSE**

**Unit-I**

**Multiple Integrals-I**

Double integrals- Change of order of integration, Double integrals in Polar coordinates- Areas enclosed by plane curves

**Unit-II**

**Multiple Integrals-II**

Triple integrals - Volume of solids - Change of variables - Area of a curved surface. Beta and Gamma functions – Properties - Relation between beta and gamma functions – Dirichlet's integrals of type I and type II.

**Unit-III**

**Vector Differentiation**

Scalar and vector fields - Gradient, Divergence and Curl - Directional derivative – Identities - Irrotational and Solenoidal fields.

**Unit-IV**

**Vector Integration**

Line, Surface and Volume integrals - Green's theorem in the plane - Stoke's and Gauss divergence theorems - Introduction of orthogonal curvilinear co-ordinates, Cylindrical co-ordinates and Spherical polar co-ordinates

**Unit-V**

**Laplace transforms**

Transforms of elementary functions - Properties of Laplace transforms - Existence conditions - Inverse transforms - Transforms of derivatives and integrals - Multiplication by $t^n$ - Division by t - Convolution theorem. Applications to ordinary differential equations and simultaneous linear equations with constant coefficients - Unit step function - Unit impulse function - Periodic functions.

**Text Books:**

1. *Higher Engineering Mathematics,*Dr.B.S Grewal, Khanna Publishers.
2. *Engineering Mathematics Vol.-1,Dr.T.K.V.Iyengar,S.Chand.*

**References :**

1. *Advanced Engineering Mathematics,* Erwin Kreyszig,Wiley Eastern Pvt. Ltd.
2. *Textbook of Engineering Mathematics,*N.P.Bali, Laxmi Publications (P) Ltd.
3. *Higher Engineering Mathematics,* Dr.M.K.Venkata Raman. National Pub. Co.

**B.Tech. (CSE)Second Semester**
**ENGINEERING PHYSICS – II**

**Code: EURPH 204** **Category: BS**
**Credits: 3** **Hours: 3 per week**
**Department: CSE**

**UNIT – I**

**INTERFERENCE:** Introduction - Interference in Thin Films - Wedge Shaped Film - Newton's Rings - Lloyd's Mirror - Michelson's Interferometer and Applications.

**DIFFRACTION:** Introduction - Differences between Fresnel and Fraunhofer Diffractions - Single Slit Diffraction (Qualitative and Quantitative Treatment) - Differences between Interference and Diffraction - Gratings and Spectra-Multiple Slits - Diffraction Grating - X-ray Diffraction - Bragg's Law.

**UNIT – II**

**POLARISATION:** Introduction - Double Refraction - Negative Crystals and Positive Crystals - Nicol's Prism - Quarter Wave Plate and Half Wave Plate - Production and Detection of Circularly and Elliptically Polarised Lights.

**LASERS:** Introduction - Spontaneous and Stimulated Emissions - Population Inversion – Ruby Laser - He-Ne Laser Semiconductor Laser – Applications.

**UNIT – III**

**MODERN PHYSICS (QUANTUM PHYSICS):** Matter Waves - Heisenberg's Uncertainty Principle - Schrodinger's Time Independent Wave Equation - Physical Significance of Wave Function ( ) - Application to a Particle in a one Dimensional Box (Infinite Potential Well) - Free Electron Theory of Metals - Band Theory of Solids (qualitative) - Distinction between Metals, Insulators and Semiconductors - Elementary Concepts of Maxwell-Boltzmann, Bose-Einstein and Fermi-Dirac Statistics (No Derivation).

**UNIT – IV**

**SEMICONDUCTORS:** Introduction - Intrinsic and Extrinsic Semiconductors - Carrier Concentration in Intrinsic Semiconductors - Carrier Concentration in n-Type Semiconductors - Carrier Concentration in p-Type Semiconductors - Hall Effect and Applications -Variation of Carrier Concentration with Temperature - Conductivity of Extrinsic Semiconductor - PN Junction - Forward Bias - Reverse Bias -VI Characteristics of a PN Junction - Fundamentals of LED, LCD - Photovoltaic Cell ( Solar Cell).

**UNIT – V**

**FIBRE OPTICS:** Introduction - Optical Paths in Fibre - Optical Fibre and Total Internal Reflection - Acceptance Angle and Cone of a Fibre - Fibre Optics in Communications - Applications.

**NANOSCIENCE:** History – Definition - Size Dependent Properties (Qualitative): Mechanical and Electrical - Growth Techniques: Top Down (PVD, Ball Milling) - Bottom Up (Sol-Gel and Co-Precipitation) - Applications.

**Text Books :**

1. Physics part I & II, Resnick, Halliday, Krane. John Wiley & Sons.
2. Applied.Physics, P.K.Palani samy. Scitech Publications (India) Pvt Ltd., Chennai

**Reference Books:**

1. Modern Physics,Arthur Beiser.Tata Mc Graw-Hill.
2. Solid State Physics,S.O.Pillai. New Age International (P)Limited, New Delhi.
3. Materials Science, M. Arumugam. Anuradha Agencies, Kumbhakonam.
4. A Text Book of Engg. Physics, Kshirsagar & Avadhanulu. S.Chand and Co.
5. The Feynman Lectures on Physics, Addison-Wesley.

**B.Tech. (CSE) Second Semester**
**ENGINEERING CHEMISTRY-II**

**Code: EURCH205** **Category: BS**
**Credits: 3** **Hours: 3 per week**
**Department: CSE**

**UNIT-I.**

**NON-CONVENTIONAL ENERGY SOURCES AND APPLICATIONS:**

Chemical: Electrode Potential –Determination of Single Electrode Potential-Reference Electrodes – Hydrogen and Calomel Electrodes. Electrochemical Series and its Applications. Primary Cell–Dry or Leclanche Cell, Secondary Cell – Lead acid storage Cell – Ni – Cd, Li batteries , Fuel Cell–Hydrogen-Oxygen Fuel Cell. Methyl alcohol – Oxygen, Propane – Oxygen fuel cell.
Solar : Photoelectric cells –Applications of Solar Cells

**UNIT-II.**

**CORROSION ENGINEERING:**

Definition of Corrosion, Theories of Corrosion –Dry Corrosion and Electro Chemical Corrosion Factors Affecting Corrosion- Nature of the Metal and Nature of the Environment. Prevention of Corrosion: Metallic Coatings –Galvanising and Tinning, Anodized Coatings, Cathodic Protection-Inhibitors, Organic Coatings-Paints –Characteristics, Constituents and their functions, Varnishes.

**UNIT-III.**

**FUEL TECHNOLOGY: CALORIFIC VALUE AND SOLID FUELS:**

Classifications of Fuels – Characteristics of Fuels- Calorific Value - Units. Determination – Bomb Calorimetric Method- Dulong's formula. Solid Fuels–Coal, Classification of Coal by Rank-Analysis of Coal –Proximate and Ultimate Analysis. Coke: Manufacture of Coke- Beehive oven and Otto Hoffmann's by product Oven processes.

**UNIT-IV.**

**FUEL TECHNOLOGY : LIQUID FUELS:**

Refining of Petroleum - Petroleum products used as Fuels - Gasoline - Knocking and Octane Number of Gasoline, Synthetic Petrol –Bergius and Fishcher Tropsch methods. Diesel - Cetane Number, High speed and low speed Diesel oil.- Power Alcohol: Manufacture, Advantages and Disadvantages - LPG.

**UNIT-V.**
**LUBRICANTS :**

Classification-Properties- Viscosity and Oiliness, Flash and Fire - Points, Cloud and Pour - Points. Aniline point, Saponification number – Carbon residue, Emulsification number volatilities, precipitation number, specific gravity, neutralization number. Principles and Mechanism of Lubrication - Fluid Film, Boundary and Extreme - Pressure Lubrications.

**Text Books :**


1. *Engineering Chemistry*,P.C. Jain and M. Jain. Dhanapat Rai & Sons,Delhi.
2. *Engineering Chemistry*, B.K.Sharma.Krishna Prakashan, Meerut.
3. *A Textbook of Engineering Chemistry*, Sashi Chawla.Dhanapath Rai & Sons, Delhi.


**Reference Books :**


1. *A Textbook of Engineering Chemistry*, S.S.Dara,S.Chand & Co. New Delhi.
2. *Material Science and Engineering*, V.Raghavan,Prentice-Hall India Ltd.

**B.Tech. (CSE) Second Semester**
**OBJECT ORIENTED PROGRAMMING WITH C++**

**Code: EURCS206** **Category: BE**
**Credits: 3** **Hours: 3 per week**
**Department: CSE**

**UNIT-I**

**Introduction to OOPS:** Origins of C++, Object Oriented Programming, Headers & Name Spaces,Applications of OOP, Structure of C++ Program.

**C++ Basics:** Keywords, Constants, Data Types, Dynamic Initialization of Variables, Reference Variables, Operators in C++.

**C++ Class Overview:** Class Definition, Objects, Class Members, Access Control, Class Scope

**UNIT-II**

Parameter passing methods, static class members, this pointer, Arrays of Objects, Objects as Function Arguments, Default Arguments, Constant Arguments, Inline functions, Function Overloading, Friend Functions, Dynamic memory allocation and deallocation (new and delete)

**UNIT-III**

Constructors, Parameterized Constructors, Multiple Constructors in a Class, Constructors with Default Arguments, Dynamic initialization of Objects, Copy Constructors, Dynamic Constructors, Destructors.

Introduction to inheritance, Defining Derived Classes, Single Inheritance, Multiple Inheritance, Multi-Level Inheritance, Hierarchical Inheritance, Hybrid Inheritance, Virtual Base Classes, Abstract Classes, Constructors in Derived Classes.

**UNIT-IV**

Introduction to pointers, Pointers to Objects, Pointers to Derived Classes, compile time polymorphism, Run time polymorphism, Virtual Functions, Pure Virtual Functions,Virtual Destructors, this Pointer, Operator overloading, Rules for Operator overloading, overloading of binary and unary operators .

Files in C++: File I/O, Unformatted and Binary I/O.

**UNIT-V**

Introduction, Class Templates, Class Templates with Multiple Parameters, Function Templates, Function Templates with Multiple Parameters, Member Function Templates.

Basics of Exception Handling, Types of exceptions, Exception Handing Mechanism, Throwing and Catching Mechanism, Rethrowing an Exception, Specifying Exceptions.

**Text Book:**

1. Computer Science : A Structured Approach Using C++ second edition
Behrouz A. Forouzan and Richard F. Gilberg

**Reference Books:**

1. Object Oriented Programming in C++ by E.Balagurusamy., published by Tata McGraw-Hill.
2. Object- Oriented Programming with ANSI and Turbo C+ + , 1/eBy Ashok Kamthane
3. Problem Solving, Abstraction, and Design using C++ (6TH 11)
Frank L. Friedman

**B.Tech. (CSE) Second Semester**
**ENGINEERING PHYSICS LAB**

**Code: EURPH 212/112** **Category: BS**
**Credits: 2** **Hours: 3 per week**
**Department: CSE**

1. J – by Callender and Barne's Method.
2. Thermal Conductivity of a Bad Conductor – Lee's Method.
3. Magnetic Field Along the Axis of a Circular Coil Carrying Current – Stewart and Gee's Galvanometer.
4. Hall Effect- Measurement of Hall Coefficient.
5. Carey Foster's Bridge – Laws of Resistance and Specific Resistance.
6. Calibration of Low Range Voltmeter – Potentiometer Bridge Circuit.
7. Thickness of a Paper Strip- Wedge Method.
8. Newton's Rings – Radius of Curvature of a Plano Convex Lens.
9. Diffraction Grating – Normal Incidence.
10. Determination of Refractive Indices (o and e) of a Bi-Refringent Material (Prism).
11. Cauchy's Constants – Using a Spectrometer.
12. Dispersive Power of a Prism – Using a Spectrometer.
13. Determination of Rydberg Constant.
14. LASER – Diffraction.
15. Determination of Band Gap in a Semiconductor.
16. Optical Fibres – Numerical Aperture and Loss of Signal.
17. VI Characteristics of a pn-junction diode
18. Response of a series RLC Circuit

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**B.Tech. (CSE) Second Semester**
**OBJECT ORIENTED PROGRAMMING LAB WITH C++**

**Code: EURCS 213** **Category: BE**
**Credits: 2** **Hours: 3 per week**
**Department: CSE**

1. Write a CPP program that contains a function to exchange values of two arguments( swap) by using pointers and reference parameters.
2. Write a CPP program to find the given string is palindrome or not. Declare private member function to find palindrome of the given string and access it using public member function.
3. Write a CPP program to find transpose of 2D matrix and allocate memory dynamically to the matrix using dynamic memory allocation. Initialize and display contents of the matrix and deallocate memory.
4. Write a CPP program to add two polynomials of any degree using object as function arguments. Hint: create two objects each represent one polynomial equation.
5. Write a CPP program to add corresponding elements of two 2D matrices using friend function. Create two classes each capable of storing one 2D matrix. Declare the matrix under private access specifier and access them outside the class.
6. Write a program to find total and average marks of each student in class. Create a student class with student number, name, 6 subject marks as its members and initializes the details. Use friend class that access the details of student and calculates total, average marks and prints the result.
7. Write a program to add two matrices of same copy. Create two objects of the class and each of which refers one 2D matrix. Use constructor to allocate memory dynamically and use copy constructor to allocate memory when one array object is used to initialize another.
8. Write a Program to Generate Fibonacci Series by using Constructor to Initialize the Data Members.
9. Write a program for finding area of different geometric shapes (circle, Rectangle, cube). Use function overloading with type, order, sequence of arguments to find the area of shapes.
10. Write a program which prompts the user to enter a string and returns the length of the longest sequence of identical consecutive characters within the string using pointers to data members and member function. For example, in the string "aaaAAAAAjjB", the longest sequence of identical consecutive characters is "AAAAA".
11. Write a program to calculate gross and net pay of employee from basic salary. Create employee class which consists of employee name, emp_id, and basic salary as its data members. Use parameterized constructor in the derived class to initialize data members of the base class and calculate gross and net pay of the employee in the derived class.
12. Write a program to calculate bonus of the employees. The class master derives the information from both admin and account classes which intern derives information from class person. Create base and all derived classes having same member functions called getdata, display data and bonus. Create a base class pointer that capable of accessing data of any class and calculates bonus of the specified employee. (Hint: Use virtual functions)
13. Write a program to add two matrices of mxn size using binary operator overloading.
14. Write a program to find transpose of a given matrix of mxn size using unary operator overloading.
15. Write a program to concatenate one string to another using binary operator overloading.
16. Write a program that uses functions to perform the following operations:
    a) To copy contents of one file into another file.
    b) To replace a word with other word in a given file?
    c) To count the no of occurrences of a word in a given file
17. Write a program to sort a given set of elements using function template.
18. Write a program to search a key element in a given set of elements using class template.
19. Write a program to find average marks of the subjects of a student. Throw multiple exceptions and define multiple catch statements to handle division by zero as well as array index out of bounds exceptions.
20. Write a program to find factorial of a given number. Throw multiple exceptions and define multiple catch statements to handle negative number andout of memory exception. Negative number exception thrown if given number is negative value and out of memory exception is thrown if the given number is greater than 20.

**B.Tech. (CSE)Second Semester**
**ENGINEERING GRAPHICS PRACTICE**

**Code: EURME215/115** **Category: BE**
**Credits: 2** **Hours: 2 per week**
**Department: CSE**

1. Introduction to AutoCAD, Beginning a new drawing, exploring and interacting with the drawing window, saving and opening a file, Coordinate systems (Cartesian ,polar and relative co-ordinate system)
2. Introduction to draw commands – line, circle, rectangle, polygon etc.
3. Introduction to modify commands – extend, trim, chamfer, rotate, etc.
4. Introduction to dimensioning and object properties.
5. Engineering Curves – Conics –general method, cycloid, epicycloids, hypocycloid, involutes.
6. Projection of planes
7. Sections and sectional views of solids – prism, pyramid, cylinder, cone
8. Developments of solids- prism, pyramid, cylinder, cone.
9. Intersection of solids- prism to prism, cylinder to cylinder

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**B.Tech. (CSE)Third Semester**
**FUNDAMENTALS OF ELECTRONICS & ELECTRICAL CIRCUITS**

**Code: EURCS 301** **Category: BE**
**Credits: 4** **Hours: 4 per week**
**Department: CSE**

**UNIT - I:**

**BASICS OF ELECTRICAL ENGINEERING:** ohm's law, kvl and kcl, nodal analysis, mesh analysis, series and parallel combination of resistors, thevenin's theorem, norton's theorem, superposition theorem

**UNIT - II:**

**BASICS OF ELECTRONICS:** classification of materials, semiconductors, intrinsic and extrinsic semiconductors, pn junction diode, vi characteristics, diode applications as rectifier, half wave rectifier, full wave rectifier, bridge rectifier, BJT formation and operation, JFET characterIstics, MOSFET depletion

**UNIT- III:**

BJT as an amplifier h parameter model, CE,CB,CC amplifier and analysis, negative feedback concepts, advantages and disadvantages of negative feedback amplifiers, positive feedback, theory operation of RC phase shift, wein bridge, crystal oscillators

**UNIT –IV:**

**Definitons :** Sinusoidal sources, average and RMS values, form factor, power factor, active and reactive power
AC Machines: 3Phase induction motor, construction details, slip-torque characteristics, single phase induction motors, principle. single phase transformers, operation, equivalent circuit of transformers

**UNIT -V:**

**DC Machines:** Construction and working principle of dc machine, emf equation, types of excitation, characteristics of series , shunt and compound generators, dc motor characteristics, construction, losses and efficiency

**Text Books:**

1. Basic Electronics – VK Mehta
2. Electrical Technology Volume 2 – B L Thereja

**Reference Books:**

1. Integrated Electronics – Millman and Halkias
2. Electronics and Devices – C Dharma Raj and B. T. Krishna
3. Introduction to Electrical Engineering – M.S. Naidu and S. Kamakshaiah

**B.Tech. (CSE) Third Semester**
**PROBABILITY & STATISTICS**

**Code: EURCS 302** **Category: MT**
**Credits: 3** **Hours: 3 per week**
**Department: CSE**

**UNIT – I**

**Probability:** Definitions of Probability, addition theorem, conditional Probability, Multiplication theorem, Baye's theorem of Probability and Geometric Probability. Random Variables and their properties, Discrete Random Variable, Continuous Random Variable, Probability Distribution, Transformation variables, Mathematical expectations , Probability generating functions, Probability distribution / Discrete distributions : Binomial , Poisson , negative binomial distributions and their properties.(Definition, mean, variance, moment generating function, additive properties , fitting of the distribution)

**UNIT – II**

**Continuous distributions:** Uniform, normal exponential distributions and their properties, rectangular distribution and its properties. Curve fitting – Principle of least squares, method of least squares, working procedure, Fitting of other curves.

**UNIT – III**

**Multivariate Analysis:** Correlation, correlation coefficient, Rank correlation, Regression analysis, $\chi^2$ –test for goodness of fit, test for independence. Estimation : Sample, populations, statistic, parameter, sampling distribution, standard error, unbiasedness, efficiency, maximum likelihood estimator, notion & interval estimation

**UNIT – IV**

**Testing of Hypothesis:** Formulation of Null Hypothesis, critical regions, level of significance, and power of the test.

**UNIT – V**

**Small sample Tests:** Testing equality of means, testing equality of variances, test of correlation coefficients, test for regression coefficient.
**Large sample Tests:** Tests based on Normal distribution.

**Text Book:**

1. Fundamentals of Mathematical Statistics, S.C. Gupta & V.K.Kapoor S.Chand Publications.

**Reference Books:**

1) Probability Statistics with Reliability, Queuing and Computer Science Application,
Kishar . S, Trivedi, PHI Publication.
2) Probability & Statistics, M.R. Spiegel, J.Schiller & R Alu Srinivasan – Schum Series
McGrawhill Publication.

**B.Tech. (CSE)Third Semester**
**Discrete Mathematical Structures**

**Code: EURCS 303** **Category: CE**
**Credits: 3** **Hours: 3per week**
**Department: CSE**

**Unit-I**

Basic Elements of an Argument, Working Forward Method, Aspects of Discovery, Inductive Reasoning, Analysis-Synthesis and Working Backward Methods, Fallacies, Circular Reasoning, Fundamentals of logic, Logic inferences, Methods of Proof of an Implication, First Order Logic and Other Methods of Proof, Rules of Inference for Quantified Propositions, Strong Mathematical Induction.

**Unit-II**

Principles of counting, Combinations and Permutations with/ without repetitions, Multinomial Theorem, Generating Functions of Sequences, Calculating Coefficients of Generating Functions, Recurrence Relations, Types of Recurrence Relations, Solving Linear Recurrence Relations by Substitution Method, Generating Functions, Characteristic Roots. Solving Systems of Recurrence Relations, Solving Non-Linear Recurrence Relations.

**Unit-III**

Relations and Ordering, Properties of Binary Relations, Relation Matrix and Graph of a Relation, Partition and Covering of a Set, Equivalence Relation, Compatibility Relations, Composition of Binary Relations, Partial Ordering, Partial Ordered Set : Representation & Associated Terminology. Basics of Functions, Primitive Recursive Function.

**Unit-IV**

Basic concepts of Graphs, Graph Traversals, Isomorphisms and Subgraphs, Planar Graphs, Euler's Formula, Multigraphs, Eulerian-Multigraphs, Hamiltonian Graphs, Hamiltonian Graphs, Chromatic Numbers. Trees, Properties of Trees, Spanning Trees, Directed Trees, Binary Trees, Binary Tree Traversals.

**Unit –V**

Introduction to Algebraic Structures, Basic concepts of Groups, Rings, and Fields. Fuzzy Sets, Operations on Fuzzy Sets, Fuzzy Relations, and Extension Principle, Applications of Fuzzy Set Theory.

**Text Books:**

1. Discrete Mathematics for Computer Scientists and Mathematicians, J.L. Mott, A. Kandel, T.P. Baker, Prentice-Hall.
2. Discrete Mathematical Structures with applications to Computer Science Trembly J.P.& Manohar P. TMH

**Reference Books:**

1. Discrete Mathematics and its Applications, Kenneth H. Rosen, 7th Edition, MeGraw-Hill.
2. Language, Proof and Logic, 2nd Edition, David Barker-Plummer, Jon Barwise and John Etchemendy, CSLI Publications

**B.Tech. (CSE)Third Semester**
**DATA STRUCTURES**

**Code: EURCS 304** **Category: CE**
**Credits: 4** **Hours: 4 per week**
**Department: CSE**

**UNIT – I**

**Data representation:** Introduction, linear lists, formula based representation, indirect addressing, simulating pointers, comparisons and applications. Introduction to running time analysis, space complexity analysis, Arrays, matrices, sparse matrices.

**UNIT – II**

**Linked lists:** Creation of single linked list, double linked list, circular linked list, and operations on it.
**Stacks:** definitions, operations and applications, array and linked representation of stacks.
**Queues:** definitions and operations. Array and linked representation of queues. Applications.

**UNIT – III**

**Graphs:** Definitions and representation of graphs. Graph Traversals. Applications.
**Trees:** definitions and properties, representation of binary trees, operations. Binary tree traversal.AVL trees and operations on AVL trees, B+ trees, operations on B+ trees and applications.

**UNIT – IV**

**Searching:** Linear search, Binary search, Fibonacci Search
**Hashing:** Various types hashing, and different collision resolution techniques.

**UNIT –V**

**Introduction to Sorting:** Insertion Sort, Selection Sort, Bubble Sort, Merge sort, Quick Sort, Heap Sort, Bucket Sort, Radix Sort, Shell Sort, Topological Sorting.

**Text Books:**

1. Data Structures. Algorithms and Applications in C++, S.Sahani, Tata Mc-Graw Hill.
2. Data Structures and Algorithms in C++, Adam Drozdek, Third Edition, Cengage Learning

**Reference Books:**

1. Introduction to Algorithms, Thomas H. Cormen, MIT Press
2. Data Structures and Algorithms Made Easy: Data Structure and Algorithmic Puzzles, Second Edition, Narasimha Karumanchi, Careermonk Publications
3. Data Structures and Algorithm Analysis in C++, Mark Allen Weiss, Third Edition

**B.Tech. (CSE) Third Semester**
**Switching Theory and Logic Circuits**

**Code: EURCS 305** **Category: CE**
**Credits: 3** **Hours: 3 per week**
**Department: CSE**

**UNIT-I**

**Number Representation:**Positional representation of numbers, decimal, binary, octal, Hexadecimal number systems, general radix 'r' system, numbers, conversions, complements, binary codes, arithmetic with signed unsigned numbers( addition, subtraction),Introduction to error correction and error detection.

**UNIT-II**

**Introduction to logic circuits:** Variables and functions, truth tables, logic gates and networks, Boolean algebra, synthesis using AND, OR and NOT gates, NAND and NOR logic networks, Introduction to CAD tools, introduction to Verilog.

**UNIT-III**

**Optimized implementation of logic functions:** Karnaugh map, strategy for minimization, minimization of product of sums forms, incompletely specified functions, multiple output circuits, multilevel synthesis, a tabular method for minimization, cubical technique for minimization, practical considerations, and CAD tools.

**UNIT-IV**

**Combinational logic:** Design procedures, adders, subtractors, design of arithmetic circuits using CAD tools, multiplexers, demultiplexers, encoders, decoders,priority encoder,code converters,seven segment display,Programmable Logic Devices-PAL,PLA, Verilog for combinational circuits.

**UNIT-V**

**Sequential circuits:** Flip flops, basic latch, gated SR latch, gated D latch, Master-slave and edge triggered D flip flop, T flip flop, JK flip flop, registers,shift registers, counters-synchronous and asynchronous counters, other types of counters-BCD counter,Ring counter,Johnson counter, using storage elements with CAD tools, using registers and counters with CAD tools.

**Text Books:**

1. Fundamental of digital logic with Verilog Design by Stephen Brown & ZVONKO VRANESIC, Tata McGrawHill.
2. Digital Design by Morris Mano published by Pearson Education.

**Reference Book:**

1. Switching Theory & Finite Automata – Z.V. Kohavi,Tata McGrawHill

**B.Tech. (CSE)Third Semester**
**DATA STRUCTURES LAB**

**Code: EURCS 311** **Category: CE**
**Credits: 2** **Hours: 3 per week**
**Department: CSE**

1. Linked lists-creation, insertion, deletion of single, double and circular lists.
2. Stack and Queue - operations using arrays and linked lists.
3. Perform the following tasks by using Stacks
    i) Infix to postfix conversion
    ii) Evaluation to postfix expression.
    iii) Checking of Nested Balanced Parenthesis
4. Perform operations (insertion and deletion) on Double Ended Circular Queues
5. Create a Binary tree and traverse it by using: - In-order, pre-order, post-order with or without using recursion
6. Create a Binary Search Tree and perform Insertion and Deletion Operations on it.
7. Binary search with or without using recursion
8. Sort 'n' elements by using – insertion, selection, Quick sort, Merge Sort Heap Sort
9. Perform Addition, multiplication of two sparse matrices and find the transpose of given Sparse Matrix
10. Polynomial addition and multiplication by using arrays and linked lists
11. Program to represent a graph by using Adjacency Matrix and Adjacency Lists representation for the given set of Vertices and Edges .And traverse it by using Breadth First Traversal and Depth First Traversal techniques
12. Create an AVL Tree and perform insertion and deletion operations.
13. Create a Splay Tree and perform insertion and deletion operations.
14. Create a B-Tree of order greater than or equal to 4 and perform insertion and deletion operations.
15. Program to demonstrate the concepts of
    i) Separate Chaining
    ii) Open Addressing (use appropriate collision resolution techniques)
    iii) Extendable Hashing

NOTE:

Detailed description of problems is to be given by the instructor before or at the time of instruction.

**B.Tech. (CSE)Third Semester**
**ELECTRICAL AND ELECTRONICS LAB**

**Code: EURCS 312** **Category: BE**
**Credits: 2** **Hours: 3 per week**
**Department: CSE**

1. Characteristics of semiconductor and zener diodes.
2. Fullwave rectifier with and without filters.
3. CRO Application
4. Static characteristics of BJT and FET
5. RC coupled amplifier
6. Oscillators-RC phase shift and wiens bridge
7. LC oscillators
8. Operational amplifiers-applications
9. Schimitt trigger
10. Feedback amplifiers
11. Simulations of above circuits using PSPICE.

Note: 1. Detailed specification for each of the experiments with the above titles is to be formulated by the instructor and given to the learners before or at the time of commencement of instruction.

2. Number of experiments under each title may not be limited to ONE.

**B.Tech. (CSE) Third Semester**
**ADVANCED COMMUNICATION SKILLS AND ENGLISH LANGUAGE LAB**

**Code: EURCS 313** **Category: HS**
**Credits: 2** **Hours: 4 per week**
**Department: CSE**

**Unit – I**

**Report writing:** Types of reports, Writing technical reports and scientific papers,writing a Statement of Purpose

**Unit – II**

**Presentation Skills:** Make effective presentations, expressions which can be used in presentations, use of non-verbal communication, coping with stage fright, handling question and answer session, Audio-visual aids, PowerPoint presentations, Seminar Skills

**Unit – III**

**Interview Skills:** planning and preparing for interviews, facing interviews confidently, use of suitable expressions during interviews.

**Unit – IV**

**Group Discussion:** objectives of a GD; Types of GDs; Initiating, continuing and concluding a GD.

**Unit – V**

**Debate:** difference between debate and group discussion, essentials of a debate, conducting a debate.
**Telephone Etiquette**

**English Language Laboratory**

**Introduction to Phonetic Transcription:** Phonemes: Vowels, Consonants and Diphthongs
Syllabification
Weak and Strong Forms
Word Stress

**Difficulties of Indian Speakers of English:** Sound, Stress and Intonation Problems

**Use of Dictionary to Develop Pronunciation:** Advantages of using a dictionary, Effective use of dictionary and thesaurus.

**Fluency and Continuous Speech:** Problems (Fluency Techniques, Pauses, Intonation, Styles of Speech - Formal and Informal)

**Text Book:**

1. Language Lab Manual, Department of English, GITAM University, 2012.

**Reference Books:**
1. A Handbook for English Language Laboratories E. Suresh Kumar et al, (With CD), Cambridge University Press India Pvt Ltd. 2009.
2. Winning at Interviews Edgar Thorpe, Pearson Education, 2006.
3. How to prepare for Group Discussions and Interviews Hari Mohan Prasad, Tata McGraw Hill, 2006.

**B.Tech. (CSE)Fourth Semester**
**COMPUTER ORGANIZATION**

**Code: EURCS 401/ EURIT 401** **Category: CE**
**Credits: 4** **Hours: 4 per week**
**Department: CSE**

**UNIT – I**

**Register Transfer and Micro operations:** Register Transfer Language, Register Transfer, Bus and Memory Transfers, Arithmetic Micro-operations, Logic Micro-operations, Shift Micro-operations, Arithmetic Logic Shift Unit.
**Computer Arithmetic:** Introduction, Addition and Subtraction, Decimal Arithmetic Unit, Booth Multiplication Algorithm

**UNIT – II**

**Basic Computer Organization and Design:** Instruction Codes, Computer Registers, Computer Instructions, Timing and Control, Instruction Cycle, Memory-Reference Instructions, Input-Output and Interrupt, Complete Computer Description, Design of the Basic Computer, Design of Accumulator logic.
**Microprogrammed Control:** Control Memory, Address Sequencing, Microprogram Example,Design of the Control Unit.

**UNIT – III**

**Central Processing Unit:** Introduction, General Register Organization, Stack Organization, Instruction Formats, Addressing Modes, Data Transfer and Manipulation, Program Control.
**Pipeline and Vector Processing:** Parallel processing, Pipelining, arithmetic pipeline,Instruction pipeline

**UNIT – IV**

**Input-Output Organization:** Peripheral Devices, Input-Output Interface, Asynchronous Data Transfer, Modes of Transfer, Priority Interrupt, Direct Memory Access. Input Output Processor.

**UNIT – V**

**Memory Organization:** Memory Hierarchy, Main Memory, Auxiliary Memory (Brief outline of HDD,CD,DVD), Associative Memory, Cache Memory and its performance considerations, Virtual Memory.

**Text Books:**

1. Computer System Architecture (Third Edition) M. Morris Mano Pearson education.
2. Computer Organization- Carl Hamacher, Zvonks Vranesic,Safeazaky, vth edition,McGraw Hill

**Reference Books:**

1. Computer Architecture and Organization (Third Edition) John P. Hayes Tata McGraw Hill
2. Computer Organization M.V.L.N.Raja Rao Scitech Publication.

**B.Tech. (CSE) Fourth Semester**
**ENVIRONMENTAL STUDIES**

**Code: EURCS 402 / EURIT 402** **Category: HS**
**Credits: 4** **Hours: 4 per week**
**Department: CSE**

**UNIT – I**

**Multidisciplinary nature of environmental studies & Natural Resources:** Multidisciplinary nature of environmental studies Definition, scope and importance. Need for public awareness .Natural Resources: Renewable and non-renewable resources. Natural resources and associated problems. Forest resources: Use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forest and tribal people. Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems. Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies. Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies. Energy resources : Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources. Case studies: Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification. Role of an individual in conservation of natural resources.Equitable use of resources for sustainable lifestyles.

**UNIT – II**

**Ecosystems and Biodiversity and its conservation:**

Concept of an ecosystem.Structure and function of an ecosystem.Producers, consumers and decomposers .Energy flow in the ecosystem.Ecological succession.Food chains, food webs and ecological pyramids. Introduction, types, characteristic features, structure and function of the following ecosystem :-. Forest ecosystem .Grassland ecosystem .Desert ecosystem. Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)Biodiversity and its conservation Introduction – Definition : genetic, species and ecosystem diversity. Biogeographical classification of India Value of biodiversity : consumptive use, productive use, social, ethical, aestheticand option valuesBiodiversity at global, National and local levels. India as a mega-diversity nation. Hot-sports of biodiversity .Threats to biodiversity : habitat loss, poaching of wildlife, man-wildlife conflicts. Endangered and endemic species of India Conservation of biodiversity : In-situ and Ex-situ conservation of biodiversity.

**UNIT – III**

**Environmental Pollution Definition Cause, effects and control measures of :-**Air pollution. Water pollution.Soil pollution.Marine pollution.Noise pollution.Thermal pollution.Nuclear hazards.

**Solid waste Management :** Causes, effects and control measures of urban and industrial wastes. Role of an individual in prevention of pollution. Pollution case studies.

**Disaster management :** floods, earthquake, cyclone and landslides.

**UNIT – IV**

**Social Issues and the Environment :**From Unsustainable to Sustainable development Urban problems related to energy. Water conservation, rain water harvesting, watershed management.Resettlement and rehabilitation of people; its problems and concerns. Case

Studies. Environmental ethics : Issues and possible solutions. Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case Studies.

Wasteland reclamation..Consumerism and waste products.

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**UNIT – V**

**Human Population and the Environment and Environment Protection Act and Field work:** Population growth, variation among nations. Population explosion – Family Welfare Programme.Environment and human health.Human Rights.Value Education.HIV/AIDS.Women and Child Welfare.Role of Information Technology in Environment and human health.Case Studies.Environment Protection Act.Air (Prevention and Control of Pollution) Act. Water (Prevention and control of Pollution) Act Wildlife Protection Act Forest Conservation Act Issues involved in enforcement of environmental legislation. Public awareness. Field work. Visit to a local area to document environmental assets river/forest/grassland/hill/mountain. Visit to a local polluted site Urban/ Rural/Industrial/Agricultural. Study of common plants, insects, birds. Study of simple ecosystems-pond, river, hill slopes, etc.

**Text Book:**

1.Text book of environmental studies for undergraduates courses by Erach Bharucha,
Published by – University Grants Commission, Universities Press,India.
2.Text book of environmental studies for undergraduates courses by Benny Joseph.Published by Tata Mc Graw Hill Publishing company limited.
3. Text book of environmental studies by Kaushik & Kaushik.

**References:**

1.Agarwal,K.C.2001 Environmental Biology,Nidi Publ.Ltd.Bikaner.
2.Brunner R.C., 1989,Hazardous Waste Incineration,McGraw Hill Inc.480p.

**B.Tech. (CSE)Fourth Semester**
**PROGRAMMING WITH JAVA**

**Code: EURCS 403** **Category: BE**
**Credits: 4** **Hours: 4per week**
**Department: CSE**

**UNIT-I**

Java Evolution, And Overview Of Java Language,Java History, Features of Java, How Java differ from C and C++, Java and World Wide Web, Web Browser. Java Environment: Java Development kit (JDK), Application Programming Interface (API).
Java Programming Structure, Java Tokens, Constants, Variables, Expressions, Decision Making Statements and Looping, Java Statements, Overview of arrays and strings, Machine Neutral, Java Virtual Machine (JVM), Command Line Arguments

**Arrays And Strings**
Arrays : One-Dimensional arrays, creating an array, declaration of arrays, initialization of arrays. Two-Dimensional arrays, String arrays, String methods, String Buffer class, Vectors, Wrapper classes. Basic I/O Streams : Scanner, BufferedReader.

**UNIT-II**

**Classes, Objects And Methods**
Introduction, Defining a class, Creating objects, Accessing class members, Constructors, Methods overloading, Static members.
**Inheritance** Defining a sub class, Sub class constructor, Multilevel variables, Final classes, and Finalize methods, Abstract methods and classes, Visibility control.
**Managing Errors And Exceptions**
Introduction, Types of Errors: Compile time and Run time errors, Exceptions, Types of Exceptions, Syntax of Exception handling code, multiple catch statements, Using finally statement, Throwing our own exceptions.

**UNIT –III**

**Interfaces, Package & Multithreaded Programming**
Introduction, Defining interfaces, Extending Interfaces, Implementing interfaces.Package :Creation , Importing a package.
Introduction to Threads, Creating Threads, Extending the Thread Class, Implementing the 'Runnable' Interface, Life cycle of a Thread, Priority of a Thread, Synchronization, and Deadlock.

**UNIT – IV**

**Applet Programming**
Introduction, How Applet differ from Applications, Building Applet code, Applet life cycle, About HTML, Designing a Web page, Passing Parameters to Applets, Getting input from the User.

**UNIT–V**

**Graphics Programming**
Introduction, Abstract window toolkit (AWT), frames, Event-driven programming, Layout managers, Panels, Canvasses, Drawing Geometric figures.
**Creating User Interface**
Introduction, Describe various User interface Components: Button, Label, Textfield, Textarea, Choicelist, Check box, Check box group. Introduction to Networking-Inet address, Socket address, URL.

**Text Book:**

1. Thinking in Java by Bruce Eckel 4th Edition,Pearson Education, Inc

**Reference Books:**

1. Java programming language – James Gosling, Bill joy.
2. An Introduction to JAVA Programming by Y.DanielLiang , TMH
3. JAVA in a Nut Shell by David Flanagan, OReilly Publications.
4. Programming with JAVA (2nd Edition) by Balagurusamy , TMH
5. Head First Java Second Edition,Kathy Sierra,Shroff Publishers

**B.Tech. (CSE) Fourth Semester**
**OPERATING SYSTEMS**

**Code: EURCS 404** **Category: CE**
**Credits: 3** **Hours: 3 per week**
**Department: CSE**

**UNIT – I**

**Introduction:** Introduction to Operating systems, Types of Operating systems: Batch systems, multi programmed systems, timesharing systems, multiprocessor systems, distributed systems, Real-time systems, Operating system Structures: System Components, Operating System Services, System Calls, System Programs, System Structure.

**UNIT – II**

**Process Management &synchronization:** Process concepts, Process scheduling, threads**,**
**CPU Scheduling:** scheduling-criteria, algorithms, algorithm evaluation.
**Process Synchronization:** Critical section Problem, synchronization Hardware, Semaphores, classic problems of synchronization, Monitors,
**Case studies** UNIX, Linux, and Windows

**UNIT – III**

**Deadlock:** System model, deadlock characterization, deadlock prevention, detection and avoidance, recovery from deadlock.
File system Interface, Implementation:File concept, Access Methods, Directory structure, protection

**UNIT – IV**

**Memory Management:** swapping, Contiguous memory allocation, paging, segmentation, segmentation with paging.
**Virtual memory:** demand paging, process creation, page-replacement, algorithms, allocation of frames, thrashing
**Case studies:** UNIX, Linux, Windows.

**UNIT – V**

**I/O systems:** Hardware, application interface, kernel I/O subsystem, Transforming I/O to Hardware operation, performance, Case studies :UNIX, Linux, Windows.
**Mass-storage structure:** Disk structure, disk scheduling, disk management. Protection:Goals of Protection, Domain of protection, Access Matrix.

**Text Book:**

1. Operating System Concepts with Java, Abraham Silberchatz, Peter B. Galvin, Greg Gagne 8/e , John Wiley

**Reference Books:**

1. Modern Operating Systems, Andrew S Tanenbaum 2nd edition, Pearson/PHI.
2. Operating System A Design Approach-Crowley, TMH.
3. Operating Systems' – Internal and Design Principles Stallings, Fifth Edition–2005, Pearson education/PHI
4. Operating systems- A Concept based Approach-D.M. Dhamdhere, 2/e, TMH

**B.Tech. (CSE)Fourth Semester**
**Software Engineering**

**Code: EURCS 405 / EURIT 405** **Category: CE**
**Credits: 4** **Hours: 4 per week**
**Department: CSE**

**UNIT I:**

Introduction to Software Engineering. Software, Software Engineering, Changing Nature of Software, Software myths.A Generic view of process.Software engineering- A layered technology, a process framework, Process patterns, CMMI, personal and team process modelsProcess models.The waterfall model, Incremental process models, Evolutionary process models,The Unified process.

**UNIT II:**

Requirements engineering. Requirements engineering tasks, Initiating Requirements engineering Process, Eliciting Requirements, Building the Analysis Model, Negotiating Requirements, Validating Requirements, Requirements Analysis, Object Oriented Analysis, Scenario-Based Modeling ,Flow-Oriented Modeling ,Class-Based Modeling.

**UNIT III :**

Design EngineeringDesign process and Design quality, Design concepts, the design model.
Creating an architectural design.Software architecture, Data design, Architectural styles and patterns, Architectural Design.Performing User interface design :Golden rules, User interface analysis and design, interface analysis.

**UNIT IV:**

Testing Strategies. A strategic approach to software testing, strategic issues, test strategies for conventional software, Validation testing, System testing.Testing Tactics.Software testing fundamentals,White-Box testing, Basic Path testing, Control Structure testing, Black-Box testing.Product metrics.Software Quality, A frame work for Product Metrics, Metrics for the analysis model, Metrics for the 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, Software reliability.

**Text Book:**

1.Software Engineering, A practitioner's Approach- Roger S. Pressman, 6$^{th}$edition.McGrawHill International Edition.

**Reference Books :**

1. Software Engineering- K.K. Agarwal & Yogesh Singh, New Age International Publishers
2. Software Engineering principles and practice- Waman S Jawadekar, The McGraw-Hill Companies.
3. Software Engineering- Sommerville, 7th edition, Pearson education

**B.Tech. (CSE)Fourth Semester**
**PROGRAMMING WITH JAVA LAB**

**Code: EURCS 411** **Category: CE**
**Credits: 2** **Hours: 3 per week**
**Department: CSE**

1. Develop a program to convert the given temperature in fahreneit to Celsius

Using the following conversion formulas C = $\frac{F-32}{1.8}$ and display the values in a tabular form.

2. Develop a program that will take a string from a command line argument and check whether it is a palindrome or not.

3. Develop a program to implement the following string methods.
   a) equals() b) compareTo() c) substring() d) indexOf() e)toLowerCase()

4. Given are two one dimensional arrays A and B which are sorted in Ascending order.write a program to merge them into a single sorted array C that contains every item from arrays A and B in Ascending order.
5. Develop a program by designing a class to represent a bank account.Include the following members:

| Data Members: | Methods: |
|---|---|
| Name of the Depositor | To assign initial values |
| Account Number | To deposit an amount |
| Type of account | To withdraw an amount after checking balance |
| Balance | To display the name and balance |

6. Develop a program to demonstrate Constructor Overloading.

7. Develop a program to demonstrate Hierarchical Inheritance using the keyword Super.

8. Develop a program to demonstrate Exception Handling by using THROW, FINALLY &MULTIPLE CATCH statements.
9. Develop a program to demonstrate multiple inheritance through interface.

10. Develop a program to illustrate the concept of extending interfaces.

11. Develop a program to illustrate the conceptof multithreading and its methods using Thread class.

12. Develop a program to illustrate the concept of multithreading using Runnable interface.

13. Develop a program to execute the sample Hello Java Applet.
14. Develop an applet that receives three numeric values as input from the user and then display the largest of the three.

15. Develop a program to illustrate the process of Passing Parameters to Applet.

16. Develop an applet that displays different bar charts.

17. Develop an applet to draw the following shapes.
    a) Cone b) Cylinder c) Cube d) Square inside a circle
    e) Circle inside a square

18. Develop a program for handling Mouse Events and to display the mouse position when the mouse is pressed.
19. Develop a program to illustrate the conceptof Grid Layout.
20. Develop a program to calculate the future value of an investment at a given interest rate for a specified number of years. The formula for the calculation is as follows:
    Future value = Investment Amount (1+ Interest Rate) years. Use text fields for interest rate, investment amount and years. Display the future amount in a text field when clicking the calculate button, or choosing calculate form the operation menu.

**B.Tech. (CSE)Fourth Semester**
**OPERATING SYSTEMS LAB**

**Code: EURCS 412** **Category: CE**
**Credits: 2** **Hours: 3 per week**
**Department: CSE**

**Objective:**

- To provide an understanding of the design aspects of operating system

**Recommended Systems/Software Requirements:**

- Intel based desktop PC with minimum of 166 MHZ or faster processor with at least 64 MB RAM and 100 MB free disk space
- C++ compiler and JDK kit

1. Simulate the following CPU scheduling algorithms
a) Round Robin b) SJF c) FCFS d) Priority

2. Simulate all file allocation strategies
a) Sequential b) Indexed c) Linked

3. Simulate MVT and MFT

4. Simulate all File Organization Techniques
a) Single level directory b) Two level c) Hierarchical d) DAG

5. Simulate Bankers Algorithm for Dead Lock Avoidance

6. Simulate Bankers Algorithm for Dead Lock Prevention

7. Simulate all page replacement algorithms
a) FIFO b) LRU c) LFU Etc. …

8. Simulate Paging Technique of memory management.

**B.Tech. (CSE)Fourth Semester**
**COMPUTER ENGINEERING WORKSHOP**

**Code: EURCS 413** **Category: CE**
**Credits: 2** **Hours: 3 per week**
**Department: CSE**

**PC Hardware**

**Week 1 – Task 1 :** Every student should disassemble and assemble the PC back to working condition. Lab instructors should verify the work and follow it up with a Viva. Also students need to go through the video which shows the process of assembling a PC. A video would be given as part of the course content.

**Week 2 – Task 2 :** Every student should individually install MS windows on the personal computer. Lab instructor should verify the installation and follow it up with a Viva.

**Week 3 – Task 3 :** Every student should install Linux on the computer. This computer should have windows installed. The system should be configured as dual boot with both windows and Linux. Lab instructors should verify the installation and follow it up with a Viva

**Week 4 – Task 4 :** Several mini tasks would be that covers Basic commands in Linux and Basic system administration in Linux which includes: Basic Linux commands in bash, Create hard and symbolic links, Text processing, Using wildcards

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

**Week 6 – Task 6 :** Software Troubleshooting : Students have to be given a malfunctioning CPU due to system software problems. They should identify the problem and fix it to get the computer back to working condition. The work done should be verified by the instructor and followed up with a Viva.

**Internet & World Wide Web**

**Week 7 - Task 1 :** Orientation & Connectivity Boot Camp : Students should get connected to their Local Area Network and access the Internet. In the process they configure the TCP/IP setting. Finally students should demonstrate, to the instructor, how to access the websites and email. If there is no internet connectivity preparations need to be made by the instructors to simulate the WWW on the LAN.

**Week 8 - Task 2 :** Web Browsers, Surfing the Web : Students customize their web browsers with the LAN proxy settings, bookmarks, search toolbars and pop up blockers. Also, plug-ins like Macromedia Flash and JRE for applets should be configured.

**Week 9 - Task 3 :** Search Engines & Netiquette : Students should know what search engines are and how to use the search engines. A few topics would be given to the students for which they need to search on Google. This should be demonstrated to the instructors.

**Week 10 - Task 4 :** Cyber Hygiene : Students would be exposed to the various threats on the internet and would be asked to configure their computer to be safe on the internet. They need to first install an anti virus software, configure their personal firewall and windows update on their computer. Then they need to customize their browsers to block pop ups, block active x downloads to avoid viruses and/or worms.

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

**Week 11 - Task1:** Students will be working on basic power point utilities and tools which help them create basic power point presentation. Topic covered during this week includes :- PPT Orientation, Slide Layouts, Inserting Text, Word Art, Formatting Text, Bullets and Numbering, Auto Shapes, Lines and Arrows in both LaTeX and Powerpoint.

**Week 12 - Task 2 :** Second week helps students in making their presentations interactive. Topic covered during this week includes : Hyperlinks, Inserting –Images, Clip Art, Audio, Video, Objects, Tables and Charts

**Week 13 - Task 3 :** Concentrating on the in and out of Microsoft power point and presentations in LaTeX. Helps them learn best practices in designing and preparing power point presentation. Topic covered during this week includes :- Master Layouts (slide, template, and notes), Types of views (basic, presentation, slide slotter, notes etc), Inserting – Background, textures, Design Templates, Hidden slides.

**Week 14 - Task 4 :** Entire week concentrates on presentation part of LaTeX and power point. Topic covered during this week includes -Using Auto content wizard, Slide Transition, Custom Animation, Auto Rehearsing
Publisher

**Week 15 :** Help students in preparing their personal website using Microsoft/ equivalent (FOSS) tool publisher. Topic covered during this week includes - Publisher Orientation, Using Templates, Layouts, Inserting text objects, Editing text objects, Inserting Tables, Working with menu objects, Inserting pages, Hyper linking, Renaming, deleting, modifying pages, Hosting website.

**Reference Books :**

1. Comdex Information Technology course tool kit Vikas Gupta, WILEY Dreamtech
2. The Complete Computer upgrade and repair book,3rd edition Cheryl A Schmidt, WILEY Dreamtech
3. Introduction to Information Technology, ITL Education Solutions limited, Pearson Education.
4. PC Hardware and A+Handbook – Kate J. Chase PHI (Microsoft)
5. LaTeX Companion – Leslie Lamport, PHI/Pearson.
6. All LaTeX and others related material is available at
   (a) www.sssolutions.in
   (b) www.sontisoftsolutions.org

**B.Tech. (CSE)Fifth Semester**
**ADVANCED COMPUTER ARCHITECTURE**

**Code: EURCS 501** **Category: CE**
**Credits: 4** **Hours: 4 per week**
**Department: CSE**

**Unit-I**

**Introduction to Parallel Processing:**

Trends towards Parallel Processing; Parallelism in Uniprocessors Systems :-Parallel Processing Mechanisms,Balancing of subsystem bandwidth ; Parallel Computer Structures:-Pipeline Computers, Array processors,Multiprocessor systems ; Architectural Classification Schemes:- Multiplicity of Instruction Data Streams , Serial Vs Parallel Processing.

**Unit-II**

**Principles of Pipelining and Vector Processing:**
Pipelining:-Principles of linear pipelining, Classification of pipeline processors; Principles of designing pipelined processors; Vector Processing requirements.
Vector Processor :-The Architecture of CRAY-1, The Architecture of CYBER-205,
Vector Processing in CYBER-205.

**Unit-III**

**Structures and Algorithms for Array Processors:**
SIMD array processors:-SIMD Computer Organization, masking and data routing mechanism,Inter –PE Communication; SIMD interconnection networks; Associative array processing:- Associative memory organization, Associative Search Algorithms.

**Unit-IV**

**Multiprocessors Architecture and Programming:**
Functional structures:- Loosely Coupled Multiporcessors, Tightly Coupled Multiporcessors; Interconnection networks; Parallel memory organization:-Interleaved Memory Configurations.

**Unit-V**

**Data Flow Computers:**
Data driven computing and languages, Data flow computer Architecture.

**Text Books:**

1. Computer Architecture and Parallel Processing, Kai Hwang and Faye A. Briggs.

**Reference Books**

1. Advanced Computer Architecture, Kai Hwang, Tata McGraw Hill

**B.Tech. (CSE)Fifth Semester**
**OBJECT ORIENTED ANALYSIS AND DESIGN**

**Code: EURCS 502/ EURIT 502** **Category: CE**
**Credits: 3** **Hours: 3 per week**
**Department: CSE**

**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 Behavioral Modeling:** Interactions, Use cases, Use case Diagrams, Interaction diagrams, Activity Diagrams

**UNIT-III**

**Basic Structural Modeling:** Classes, Relationships, Common Mechanisms, Diagrams., Class diagrams

**UNIT-IV**

**Advanced Behavioral Modeling:** Events and signals, State machines, Processes and Threads, Time and space, State chart diagrams.
Advanced Structural Modeling Advanced classes, Advanced Relationships, Interfaces,Types and Roles, Packages,Instances

**UNIT-V**

**Architectural Modeling:** Component, Deployment, Component diagrams and Deployment diagrams.
**Case Study:** The Unified Library application.

**Text Books:**

1. The Unified Modeling Language User Guide Grady Booch, James Rumbaugh, Ivar Jacobson, Pearson Education.

2. UML 2 ToolkitHans-Erik Eriksson, Magnus Penker, Brian Lyons, David Fado, WILEY-Dreamtech India Pvt. Ltd.

**Reference Books:**

1. Fundamentals of Object Oriented Design in UML Meilir Page-Jones,Pearson Education.
2. Modeling Software Systems Using UML2, Pascal Roques:, Wiley- Dreamtech India Pvt. Ltd.
3. Object Oriented Analysis & Design,Atul Kahate:, The McGraw Hill Companies.
4. Practical Object-Oriented Design with UML Mark Priestley:,TATA McGraw Hill.
5. Appling UML and Patterns: An introduction to Object–Oriented Analysis and Design and Unified Process, Craig Larman, Pearson Education.

**B.Tech. (CSE)Fifth Semester**
**DATABASE MANAGEMENT SYSTEMS**

**Code: EURCS 503/ EURIT 503** **Category: CE**
**Credits: 3** **Hours: 3 per week**
**Department: CSE**

**UNIT-I**

**Introduction to DBMS:** Overview, File system vs DBMS, Advantages of DBMS, Storage data, queries, Transaction Management, DBMS structure
**E-R model:** Entities, Attributes and Entity sets, Relationship and Relationship sets,
Features of ER model, Conceptual database design with ER model

**UNIT-II**

**Relational model:** Integrity constraints over relations and enforcement, Querying relation data, Logical database design, views, destroying/altering tables and views
**Relational algebra and calculus**

**UNIT-III**

**SQL:** Basic SQL, Query, union, interest, except, Nested Queries, Aggregated Operation, Null values, Embedded SQL, cursors, ODBC and JDBC, Triggers and Active database, designing active databases

**UNIT-IV**

**Schema refinement and normal forms:** Schema refinement, fds, fds reasoning normal forms, decomposition, normalization.

**UNIT-V**

**Transaction management, concurrency control & crash recovery**
Transaction concept, transactions and schedules, concurrent execution of transactions ,lock – based concurrency control, crash recovery.
Concurrency control - lock management, specialized locking techniques, concurrency control without locking.
Crash Recovery- Aries, recovering from a system crash, media recovery

**Text Books:**

1. Database Management Systems, byRaghu Ramakrishnan and Johannes Gehrke McGraw-Hill
2. Database System Concepts, H.F.Korth and A.silberschatz McGraw-Hill

**Reference Books:**

1. Fundamentals of Database Systems,by Ramez Elmasri, Shamkant B. Navathe
2. Fundamentals of Database Systems, Elmasri, Navathe, Somayajulu, Gupta, Pearson Education,

**B.Tech. (CSE) Fifth Semester**
**FORMAL LANGUAGES AND AUTOMATA THEORY**

**Code: EURCS 504** **Category: CE**
**Credits: 4** **Hours: 4 per week**
**Department: CSE**

**UNIT I:**

**Finite Automata and Regular Expressions:**
Basic Concepts of Finite State Systems, Deterministic and Non-Deterministic Finite Automata, Finite Automata with ε-moves, Regular Expressions, Mealy and Moore Machines.

**UNIT II:**

**Regular Sets & Regular Grammars:**
Basic Definitions of Formal Languages and Grammars, Regular Sets and Regular Grammars,Closure Properties of Regular Sets, Pumping Lemma for Regular Sets, Decision Algorithm forRegular Sets,, Myhill-Nerode Theorem, Minimization of Finite Automata, Chomsky hierarchy,Definition of unrestricted grammars.

**UNIT III:**

**Context Free Grammars and Languages:**
Context Free Grammars and Languages, Derivation Trees, Simplification of Context Free Grammars, Normal Forms, Pumping Lemma for CFL, closure properties of CFL"s, MembershipAlgorithm(CYK), Decision Algorithm for CFL,CFL relationship between class of languages.

**UNIT IV:**

**Push down Automata and Deterministic CFL:** Informal Description, Definitions, Push-Down Automata and Context free Languages, equivalence of CFL and PDFs, LR(k) Grammars, Properties of LR (k) Grammars.

**UNIT V:**

**Turing Machines and Undecidability:** Design and Techniques for Construction of Turing Machines, Rice's Theorem, Modifications of Turing Machines, Techniques of Turing machines, Universal Turing Machines(UTM), Undecidability Problems, Post Correspondence Problem(PCP), Undecidability of PCP, modifiedPost Correspondence Problem(MPCP).

**Text Books:**

1. Introduction to Automata Theory, Languages & Computation By J.E Hopcraft &Jeffery D.Ulman – Pearson Education 3/e. 2007
2. Introduction to languages & and theory of computation(sie)byJohn C martin , Narosa Publications. Edition-3e

**Reference Books:**

1. Theory of Computer Science By Mishra & Chandra Sekharan, PHI Introduction to Languages& Theory of Computation by Martin, TMH Publications.

2. An Introduction to Automata Theory &Formal Languages. --- Adesh K Pandey

**B.Tech. (CSE)Fifth Semester**
**COMPUTER NETWORKS**

**Code: EURCS 505** **Category: CE**
**Credits: 4** **Hours: 4 per week**
**Department: CSE**

**Unit-I**

Introduction - Network Hardware, Reference models - OSI, TCP/IP and Differences between OSI & TCP/IP, Internet. Physical layer – Guided Transmission media, wireless transmission, communication satellites, mobile telephone system. Data link layer – Error Detection and Correction, sliding window protocols.

**Unit-II**

MAC Sub layer - Channel Allocation Problems, Multiple Access Protocols - ALOHA, CSMA, Collision-free protocols, Ethernet - IEEE 802.x Standards, Wireless LANS - 802.11 standards, Bluetooth- standards, Data link layer switching – working of a Bridge & its types

**Unit-III**

Network Layer - Network Devices - Repeaters, Hubs, Switches, Routers and Gateways.
Network layer Design Issues, Routing Algorithms, Congestion Control Algorithms, IP & IPV6, Internet Control Protocols – ARP, RARP, DHCP.

**Unit-IV**

Transport Layer - Transport Services, Elements of Transport Protocols, The Internet Transport Protocols – UDP & TCP.

**Unit-V**

Application Layer – DNS - The Domain Name System, Electronic Mail concepts, The World Wide Web (WWW), Multimedia.

**Text Book:**

1. Computer Networks – Andrew S Tanenbum, 4th Edition. Pearson Education/PHI.

**Reference Books:**

1. Data and Computer Communications, 7th Edition by William Stallings.
2. Data Communications and Networking by Behrouz a Forouzan, 4th Edition. Tata McGraw-Hill.

**B.Tech. (CSE)Fifth Semester**
**COMPUTER NETWORKS LAB**

**Code: EURCS 511** **Category: CE**
**Credits: 2** **Hours: 3 per week**
**Department: CSE**

1. Write a program to
   a. Print the IP address of a www.yahoo.com
   b. Print the url of 205.163.22.104
   c. Print all the addresses of www.apple.com
   d. Print the IP address of the local machine
   e. Print the hostname of the local machine

2. Write a program to Identify the well known ports on a Remote System
   By trying to listen to the various well known ports by opening client connections. If the exception does not occur then the remote port is active else the remote port is inactive.
3. Given a URL, write a program to print the parts of URL.
4. Write a program to display the socket's port and IP address.
5. Write a program to send & Receive data from DatagramPacket
6. Write a program for Multicast Sniffer
7. Write a program for Multicast sender
8. Write a program for a Chat Application
   - One-One: By opening socket connection and displaying what is written by one party to the other.
   - Many-Many (Broad cast): Each client opens a socket connection to the chat server and writes to the socket. Whatever is written by one party can be seen by all other parties.

9. Write a program for the Data Retrieval from a Remote Database
   At the remote database a server listens for client connections. This server accepts SQL queries from the client, executes it on the database and sends the response to the client.
10. Write a program for the Mail Client
    - POP Client : Gives the server name , user name and password retrieve the mails and allow manipulation of mail box using POP commands.
    - SMTP Client: Gives the server name, send e-mail to the recipient using SMTP commands- (Core Java 2 pg:163.)
11. Write a program for the Simulation of Telnet
    Provide a user interface to contact well-known ports, so that client-server interaction can be seen by the user.
12. Write a program for the Simple file transfer between two systems
    By opening socket connection to our server on one system and sending a file from one system to another.
13. Write a program for the TFTP-Client
    To develop a TFTP client for file transfer. (Unix Network programming- Stevens)
14. Write a program for the HTTP-Server
    Develop a HTTP server to implement the following commands GET, POST, HEAD, DELETE. The server must handle multiple clients.

**Reference Books:**

1. Java Network Programming, Harold Orielly
2. An Introduction to Computer Networking, Kenneth C. Mansfield Jr and James Antonakos Pearson Education Asia

**Web Resource:**

1. http://www.cafeaulait.org/books/jnp/javanetexamples/index.html

**B.Tech. (CSE) Fifth Semester**
**D B M S Laboratory**

**Code: EURCS 512** **Category: CE**
**Credits: 2** **Hours: 3 per week**
**Department: CSE**

1. Design ER Model for a given application
2. Convert ER model to Relational Model
3. Creating and Altering tables for various relations in SQL
4. Implement Integrity Constraints. ( Key constraints, Domain constraints)
5. Implementing queries in SQL using
   5.1 Insertion
   5.2 Retrieval (operations like union, intersect, minus, in, exists, group by and having etc.)
   5.3 Updation
   5.4 Deletion
6. Built in functions in oracle ( String, Date, Aggregate functions etc.)
7. Working with views
8. Implementing joins, sub queries, nested and co related nested queries
9. Creating triggers and exception handling
10. Implementing cursors
11. Implementing operations on relations using PL/SQL
12. Implementing functions and stored procedures
13. Implementing the concepts of Rollback, commit and checkpoints
14. Database connectivity using JDBC & ODBC

Perform physical design based above logical design using Oracle/MSSQL on windows platform or MYSQL/PostgreSQL on Linux platform

Perform DML and DLL using PL/SQL or PL/pgSQL for the above problems.

**Reference Books**

1. Oracle PL/SQL programming by Steven Feuerstein O'reilly Publishers.
2. Oracle books, Oracle press.

**B.Tech. (CSE)Sixth Semester**
**LANGUAGE PROCESSORS**

**Code: EURCS 601** **Category: CE**
**Credits: 4** **Hours: 4 per week**
**Department: CSE**

**UNIT – I:**

Introduction to Language Processors:- Need for Compilers, Assemblers, Macros & Loaders, Assemblers: Design of two pass assembler, Macro Processors: Features of Macro processors, Design of two pass macro processor, Loaders: Various Loader schemes, Overview of Compilation: The Structure of Compiler - Phases of the Compiler, Boot strapping.

**UNIT - II**

Lexical Analysis: The role of the Lexical analyzer, Regular Grammar and Regular expression for common programming language features, Input Buffering, Recognition of Tokens, Automatic Lexical Analyzer generator (LEX/FLEX).

Syntax Analysis (Part-I): Context Free Grammars

Top-Down parsing techniques: Recursive Descent Parsing, First and Follow, LL(1) grammars, Non-recursive Predictive Parsing, Error Recovery in Predictive Parsing

**UNIT – III**

Syntax Analysis (Part-II): Bottom-Up parsing techniques: Reductions, Handle Pruning, Shift Reduce Parsing, Simple LR Parser, Canonical LR and LALR Parsing Techniques, Ambiguous grammars, Parser Generator (YACC).

**UNIT - IV**

Syntax Directed Translation: Syntax Directed Definition - Inherited and Synthesized Attributes, Evaluation Orders for SDD's – Dependency Graphs, S-attributed & L-attributed

Definition and Syntax Directed Translation Schemes.

Intermediate code forms: Three Address code: quadruples, triples, Translation of Expressions – Operations within Expressions, Control Flows-Boolean expressions, Flow-of-Control Statements.

Run-Time Environments: Storage Organization, Stack allocation of Space

**UNIT - V**

Code Generation: Issues in the design of a code Generator, Basic blocks and Flow Graphs, Dag Representation of Basic Blocks, A Simple Code Generator, Register allocation and Assignment, Peephole Optimization.

Machine Independent Optimization: The Principal Sources of Optimization, Data-Flow Analysis – Introduction, constant propagation, Redundancy Elimination, Loops in Flow Graphs

**Text Books:**

1. Systems Programming by John J. Donovan, Tata McGraw-Hill Edition.(for UNIT-I)
2. Compilers Principles, Techniques and Tools- Alfred.V. Aho, J.D.Ullman, Ravi Sethi; 2nd Edition, Pearson Education

**Reference Books:**

1. Principles of compiler design- A.V.Aho, J.D.Ullman; Pearson Education
2. Lex & yacc - John R. Levine, Tony Mason, Doug Brown, O'reilly
3. Modern Compiler Design- Dick Grune, Henry E.Bal, Cariel T.J.Jacobs, Wiledreamtech.
4. Engineering a compiler- Cooper Linda, Elsevier.
5. Compiler Design In C- Allen I. Holub.

**B.Tech. (CSE)Sixth Semester**
**DESIGN AND ANALYSIS OF ALGORITHMS**

**Code: EURCS 602** **Category: CE**
**Credits: 4** **Hours: 4 per week**
**Department: CSE**

**UNIT I**

Introduction to algorithms: Algorithm specification -- Performance Analysis. *Divide and Conquer:* The general method -- Binary search -- finding maximum and minimum -- Merge sort -- Quick sort -- Selection -- Strassen's Matrix multiplication.

**UNIT II**

The Greedy Method*:* The general method – Knapsack problem -- Job sequencing with deadlines -- Optimal storage on tapes -- minimum cost spanning trees -- single source shortest paths.

**UNIT III**

Dynamic Programming*:* The general method -- Multistage graphs -- all pairs shortest paths -- optimal binary search trees -- reliability design -- the traveling sales person problem.

**Unit IV**

Basic search and traversing techniques: Techniques for Binary trees – Techniques for Graphs – Connected components and spanning trees -- Bi-connected components and depth first search. Back Tracking*:* The General Method -- Eight Queens problem -- Sum of subsets -- Graph coloring -- Hamiltonian cycle.

**Unit V**

Branch and Bound*:* The method -- Traveling sales person problem -- efficiency considerations. Algebraic Problems*:* The general method -- Evaluation and Interpolation.

**Text Books:**

1. Fundamentals of Computer Algorithms, by Ellis Horowitz, S. Sahni et.al.Galgotia Pub. 2001.
2. Introduction to Algorithms, 3rd Edition, by Thomas H. Coremen, Charles E. Leiserson et.al. MIT Press

**Reference Books:**

1. The Design and Analysis of Computer Algorithms by Aho, Hopecraft, Ullman.
2. Algorithm Design, Foundations, Analysis, and Internet Examples by Michel T. Goodrich & Roberto Tamassia, John Weily and Sons
3. Computer Algorithms: Introduction to Design and Analysis by Sara Baase, Allen Van Gelder, Pearson Education.
4. Data Structures and Algorithm Anaysis in JAVA, 3rd Edition, by Mark Allen Weiss, pearson Education.
5. Algorithm Design, by Jon Kleinberg, Eva Tardos, Pearson

**B.Tech. (CSE) Sixth Semester**
**MANAGERIAL ECONOMICS**

**Code: EURCS 603** **Category: HS**
**Credits: 3** **Hours: 3 per week**
**Department: CSE**

**Unit-I**

**Introduction :** Meaning, Nature and Scope of Economics, Meaning of Science, Engineering and Technology. Managerial Economics and its scope in engineering perspective.

**Unit-II**

**Basic Concepts**
Demand Analysis, Law of Demand, Determinates of Demand, Elasticity of Demand-Price, Income and cross Elasticity. Uses of concept of elasticity of demand in managerial decision.

**Unit-III**

**Demand forecasting**
Meaning, significance and methods of demand forecasting, production function, Laws of returns to scale & Law of Diminishing returns scale. An overview of Short and Long run cost curves – fixed cost, variable cost, average cost, marginal cost, Opportunity cost.

**Unit-IV**

**Market Structure**
Perfect Competition, Imperfect competition – Monopolistic, Oligopoly, duopoly sorbent features of price determination and various market conditions.

**Unit-V**

**National Income, Inflation and Business Cycles**
Concept of N.I. and Measurement. Meaning of Inflation, Type causes & prevention methods, Phases of business cycle.

**Text Books:**

1. Modern Microeconomics Koutsoyiannis A :, ELBS.
2. Managerial Economics for Engineering : Prof. D.N. Kakkar
3. Managerial Economics : D.N. Dwivedi
4. Managerial Economics : Maheshwari.

**Reference Books:**

1. ManagerialEconomics,6thEdition,PaulKeat,PhilipYoung
2. Managerial Economics 3rdEdition, 3rdEdition, Howard Davies, Pun-Lee Lam

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**B.Tech. (CSE) Sixth Semester**
**WEB TECHNOLOGIES**

**Code: EURCS 604/ EURIT 604** **Category: CE**
**Credits: 3** **Hours: 3 per week**
**Department: CSE**

**UNIT-I:**
**Introduction to Web Technology:** Internet, WWW, Web Browsers with suitable examples , Web Servers with suitable examples, URL, HTTP, MIME.
**Introduction to HTML:** Basic Syntax, HTML Document Structure, Text Formatting, Images, Lists, Links, Tables, Frames, Forms.
**Cascade Style Sheets :** Levels Of Style Sheets, Specification Formats, Style Classes , Properties, Colors, Span and Div tags.

**UNIT-II**
**Introduction to Java Script:** Overview of java Script, Syntactic characteristics, Primitives, Operator and Expression, control statements, Arrays, functions, errors in scripts, Document Object Model(DOM),Event driven computation, Element access in Java script, The navigator Object.
**Dynamic Document with Java Script :** Element positioning, Moving elements, Changing colors and fonts, Dynamic content, Locating the mouse Cursor, Slow movements of elements, Dragging and Dropping Elements.

**UNIT-III**
**Introduction to XML:** Syntax of XML, Document Structure, and Document Type Definition, Namespaces, XML Schemas, Document Object Model, Presenting XML, Using XML Processors: DOM and SAX. XSLT, XQuery.

**UNIT-IV:**
**Networking and Servlets:**
Introduction to networking using JAVA API, TCP/IP Sockets and Datagram Sockets.
Web Servers and Servlets: Tomcat web server, Introduction to Servelets: Lifecycle of a Servelet, The Servelet API, The javax.servelet Package, The javax.servelet HTTP package, Handling Http Request & Responses, Using Cookies-Session Tracking, Security Issues, Structure of Web Application, Deploying Web Application, Introduction to Model View Controller (MVC) Architecture, its structure, components.

**UNIT-V:**
**Introduction to PHP:** Overview of PHP, general server characteristics, Creating PHP Pages, Form handling, Data Base access with PHP & MySql.
Introduction to JSP: The Problem with Servelet. The Anatomy of a JSP Page, JSP Processing. JSP Application Design with MVC Setting Up and JSP Environment: Installing the Java Software Development Kit, Tomcat Server & Testing Tomcat, JSP Components, Comments, Expressions, Scriplets.

**Text Books:**
1. Programming world wide web, Robert W.Sebesta , Pearson 2nd edition
2. JAVA 2: The Complete Reference Herbert Schildt,, 5th Edition, TMH, 2002
3. Web Technologies ,Oxford Higher Education publication by UTTAM K ROY.
4. Beginners PHP, Apache, MY Sql, Web Development, by Michael Glass Wrox.

**Reference Books:**
1. Core SERVLETS ANDJAVASERVER PAGES VOLUME 1: CORE TECHNOLOGIES By Marty Hall and Larry Brown Pearson
2. Internet and World Wide Web – How to program by Dietel and Nieto PHI/Pearson Education Asia.
3. Jakarta Struts Cookbook , Bill Siggelkow, S P D O'Reilly for chap 8.
4. Murach's beginning JAVA JDK 5, Murach, SPD
5. An Introduction to web Design and Programming –Wang-Thomson
6. Web Applications Technologies Concepts-Knuckles,John Wiley
7. Web Warrior Guide to Web Programmming-Bai/Ekedaw-Thomas
8. Beginning Web Programming-Jon Duckett WROX.
9. Java Server Pages, Pekowsky, Pearson.
10. www.w3schools.com

**B.Tech. (CSE)Sixth Semester**
**COMPUTER GRAPHICS AND MULTIMEDIA**

**Code: EURCS 605** **Category: CE**
**Credits: 3** **Hours: 3 per week**
**Department: CSE**

**UNIT-I**

Introduction to computer graphics- Introduction, Non interactive/interactive Graphics, Uses of computer graphics, classification of Applications, Programming Language, Graphics system configuration
Graphic Systems-Introduction, Cathode Ray Tube(CRT)basics, Refresh Display, Raster Display, Computer Graphic Software, Integration of Graphics Standard

**UNIT-II**

Output Primitives- Introduction, Representing Image, Straight Line, Line drawing algorithms,Differential Digital Analyser(DDA)algorithm, Bresenham's Line Algorithm, Circle generatingAlgorithm, Bresenham's circle Algorithm, Midpoint circle Algorithm, Polygon filling Algorithms,Character or Text Generation, Aliasing and Antialising

**UNIT-III**

Two Dimensional Transformations-Introduction, Representation of points, Matrix Algebra andTransformation, Transformation of points, Transformation of straight line, Midpoint Transformation,Transformation of Parallel Lines, Transformation of Intersecting Lines, Rotation
Window Clipping- Introduction, Viewing Transformation, Clipping, Point Clipping, Line Clipping,Cohen-Sutherland Line clipping, Polygon Clipping, Sutherland-Hodgman Algorithm, Curve Clipping

**UNIT-IV**

3D Concepts and Techniques- Introduction, 3D Transformations, Rotation about an axis Parallelto a Coordinate Axis, Rotation about an Arbitrary Axis in Space, Reflection through an ArbitraryPlane, 3D Modeling Schemes, Projection, Orthographic Projection, Isometric Projection, ObliqueProjection,perspective projection
Curves-Introduction, Parametric cubic polynomial curves, Solution of cubic polynomial curves, Beziercurves, Spline representation, Parametric and geometric continuity condition, Spline as piecewisepolynomials, Spline as blending function, Closed curves based Spline, Changing knot spacing, Basisfunction for Spline curves, B-Spline basis functions, B-Spline with multiple knots

**UNIT-V**

Introduction To Multimedia:-Pc specification, visual elements ,wav and mp3 format ,sound elements ,multimedia storage,flash animation.

**TextBooks:**

1. Computer Graphics, Amarendra N Sinha, Arun D Udai, TataMcGrawHill
2. Fundamentals of Multimedia,Ze-Nian Li, Mark S. Drew,Pearson Prentice Hall

**Reference Books:**

1. Multimedia and communications technology,Steve Heath, Elsevier
2.Mathematical Elements for Computer Graphics,2nd Edition, David F. Rogers, J. Alan Adams

**B.Tech. (CSE)Sixth Semester**
**AI & MACHINE LEARNING**

**Code: EURCS 606** **Category: CE**
**Credits: 4** **Hours: 4 per week**
**Department: CSE**

**UNIT-I**

**Introduction:** Well-Posed Learning Problems, Designing a Learning System, Issues in Machine Learning, A Concept Learning Task, Concept Learning as Search, FIND-S: Finding a Maximally Specific Hypothesis, A Biased Hypothesis Space, Inductive Bias

**UNIT-II**

**Decision Tree Learning:** Decision Tree Representation, Appropriate Problems for Decision Tree Learning, Hypothesis Space Search in Decision Tree Learning, Inductive Bias in Decision Tree Learning, Issues in Decision Tree Learning, Bayesian Learning – Bayes Theorem

**UNIT-III**

**Knowledge Representation:** Representing Simple Facts in Logic, Representing Instance and IsA Relationships, Computable Functions and Predicates, Resolution, Procedural versus Declarative Knowledge, Logic Programming, Forward vs Backward Reasoning

**UNIT-IV**

**Artificial Neural Networks:**Neurons and Biological Motivation, Neural Network Representations, Problems for Neural Network Learning, Perceptrons, Multilayer Networks and the Back Propagation Algorithm

**UNIT-V**

**Genetic Algorithms:** Representing Hypothesis, Genetic Operators, Fitness Function and Selection, An Illustrative Example, Hypothesis Space Search, Genetic Programming

**TextBooks:**

1. Machine Learning – Tom Mitchel
2. Artificial Intelligence – Rich E & Knight K TMH (1991)

**Reference Books:**

1. Artificial Intelligence Structures and Strategies complex problem Solving – George F. Lugar, Pearson Education

**B.Tech. (CSE)Sixth Semester**
**LANGUAGE PROCESSORS LAB**

**Code: EURCS 611** **Category: CE**
**Credits: 2** **Hours: 3 per week**
**Department: CSE**

1. Implement transition diagrams for identifying an identifier and constant and classify the identifier as either variable or array or function or structure and constant as integer or real.
2. Consider the following circuit language that used to describe the circuits(parallel,sequential or both). The syntax of the language is defined by following grammar

<circuit> --->seq<block> | par<block> | <value>
<block>---><circuit><block>| end
<value>---><digit><value> | <digit>
<digit>----->0|1|2|3|4|5|6|7|8|9

A simple program written in this language is:
par66 seq par 3672 9 end
(36, 72 connected in parallel intern connected with 9 in sequential intern connected with 66 in parallel.)

a) Design a Lexical analyser for the above language. The lexical analyser should ignore redundantspaces, tabs and newlines. Although the syntax specification states that value can be arbitrarily long, you may restrict the length to some reasonable value.
b) Implement the lexical analyser using JLex, flex or lex or other lexical analysergenerating tools.
c) Implement syntax analyser for the circuit language by using RecursiveDescent parser which takes output of the lexical analyser and checks whether it follows the syntax or not. (Hint: assume that lexical analyser returns val token for integer constant then grammar isC-->seqB|parB|val B-->CB|end and checking for this words in implementation of recursive descent parsing is like next==s and next+1==e and next+2==q for seq)
d) Write Yacc code to get final circuit value for the above simple program output should be 22.
(Hint: 36, 72 in parallel value is 24. 24, 9 in sequential value is 33. 33,66 in parallel value is 22. Final result is 22.)

3. Write a program to read CFG productions and store into corresponding data structures.
4. Write a program for eliminating Left-Recursion from the given grammar.
5. Write a program for applying left factoring to a given grammar.
6. Implement algorithms for finding First and Follow symbols of a given grammar.
7. Consider the following Expression language that used to describe the Arithmetic expressionsin Calculator The syntax of the language is defined by following grammar

<Line>--><exp>\n

<exp> ---><exp>+ <exp>| <exp>-<exp>|<exp>*<exp>|<exp>/<exp>
<exp>--><value>
<value>---><digit><value> | <digit>
<digit>----->0|1|2|3|4|5|6|7|8|9

A simple program written in this language is:
2+45*34/17-67+78/6\n

a) Design a Lexical analyser for the above language. The lexical analyser should ignore redundantspaces, tabs and newlines. Although the syntax specification states that value can be arbitrarily long, you may restrict the length to some reasonable value.
b) Implement the lexical analyser using JLex, flex or lex or other lexical analyser generating tools.
c) Implement syntax analyser for the Expression language by using RecursiveDescent parser which takes output of the lexical analyser and checks whether it follows the syntax or not. (Hint: assume that lexical analyser returns val token for integer constant then grammar isE-->E+E|E-E|E*E|E/E|val and checking for this words in implementation of recursive descent parsing is like next==v and next+1==a and next+2==l for val)
d) Implement Operator Precedence parser for the above language. Which takes operator precedence matrix and the string as the input and check whether the string is accepted or not.(Hint: take the grammar given in question c.)
e) Write Yacc code to get final Expression value, for the above simple program output should be 38.
f) Write Yacc code to get three address codefor the given expression.

8. Consider the following grammar which is used to describe the X language which might be used in next generation programmable calculators.It supports integer, real and complex numbers This language uses something called Hungarian notation the name of the variable itself tells you about the type of the data it contains if the starting letter is 'i' then integer , 'r' then real , 'c' then complex number

<program> → begin<stmts>end
<stmts> ---><statement>;<stmts>| <statement>;
<statement> ---><identifer>=<expr> | <conditional>
<expr> ---><expr> + <term> |<expr>-<term>|<term><term> ---><term>*<fact>|<fact>
<fact>--><identifier><conditional>--->if <cexpr>thenbegin<stmts>end<cexpr> ---><identifier>==<identifier>
|<identifier>!=<identifier>
<identifier> --->i<letters>|r<letters>|c<letters>
<letters> ---><letter><letters>|<letter>
<letter>----->a|b|....|z|A|B|.....|Z

a) Design a Lexical analyser for the above language. The lexical analyser should ignore redundantspaces, tabs and newlines. Although the syntax specification states that value can be arbitrarily long, you may restrict the length to some reasonable value.
b) Implement the lexical analyser using JLex, flex or lex or other lexical analyser generating tools.
c) Implement Predictive parser for the above language.
d) Implement LALR bottom up parser for the above language.
e) Convert the CFG rules into Yacc form and write code to generate abstract syntax tree or three address code.
f) Write program to generate 8086 assembly code from the abstract syntax tree or three address code generated by the parser.The target assembly instructions can be simple move, add, sub, and jump. Also simple addressing modes are used.

**B.Tech. (CSE)Sixth Semester**
**WEB TECHNOLOGIES LAB**

**Code: EURCS 612** **Category: CE**
**Credits: 2** **Hours: 3 per week**
**Department: CSE**

**Hardware and Software required :**

A working computer system with either Windows or Linux
A web browser either IE or firefox
Tomcat web server and Apache web server
XML editor like Altova Xml-spy [**www.Altova.com/XMLSpy – free ] , Stylusstudio , etc.,**
A database either Mysql or Oracle
JVM(Java virtual machine) must be installed on your system

**Experiment-1:**

Design the static web pages required for any online services 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, Cart Page etc.
Left frame : At least four links for navigation, which will display the catalogue of respective links.
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 has to contain Login Form, Forgot Password, and Link to new user Registration Form, back to Home page etc.If the user is authenticated user, can access the web site. Otherwise he has to register.

3). Registration page:

This page has to contain User Registration form minimum of 10 Fields (use all the form Widgets) If the user is authenticated user, can access the web site.

4) CATOLOGUE PAGE:
The catalogue page should contain the details of all the items available in the web site in a table.

5) Cart page:
Selected list of items has to display in table format & compute cost before submitting. (Use Event Handler functions)

**Experiment -2:**
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.

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:

3) Define styles for links as
4) Work with layers such as Span& Div Tags.

**Experiment-3:**

VALIDATION:
Write *JavaScript* to validate the following fields of the above registration page.

2. Name (Name should contains alphabets and the length should not be less than 6 characters).
3. Password (Password should not be less than 6 characters length).
4. 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).

Note: You can also validate the login page with these parameters.

**Experiment -4:**

Write an XML file which will display the item (your wish) information which includes the following (for example)

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

**Experiment -5:**

Install TOMCAT web server and APACHE.

While installation assign port number 4040 to TOMCAT and 8080 to APACHE. Make sure that these ports are available i.e., no other process is using this port.

1) 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:4040/rama/books.html
(for tomcat) http://localhost:8080/books.html (for Apache)

**Experiment -6:**

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 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 webinf.xml and access them in the servlet by using the getInitParameters() method.

**Experiment -7:**

Install a database(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

**Experiment -8:**

Write a JSP which does the following job:
Insert the details of the 3 or 4 users who register with the web site by using registration form. Authenticate the user when he submits the login form using the user name and password from the database.

**Experiment -9:**

Install a database(Mysql).

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).

Write a PHP to connect to that database and extract data from the tables and display them. Experiment with various MySQL 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 .

**B.Tech. (CSE) Seventh Semester**
**EMBEDDED SYSTEMS**

**Code: EURCS 701** **Category: CE**
**Credits: 3** **Hours: 3 per week**
**Department: CSE**

**UNIT-I**

**Embedded Computing:** Introduction, Complex Systems and Microprocessor, The Embedded System Design Process, Formalisms for System Design, Design Examples.(Chapter I from Text Book 1, Wolf).
**The 8051 Architecture:** Introduction, 8051 Micro controller Hardware, Input/Output Ports and Circuits, External Memory, Counter and Timers, Serial data Input/Output, Interrupts. (Chapter 3 from Text Book 2, Ayala).

**UNIT-II**

**Basic Assembly Language Programming Concepts:** The Assembly Language Programming Process, Programming Tools and Techniques, Programming the 8051. Data Transfer and Logical Instructions.
(Chapters 4, 5 and 6 from Text Book 2, Ayala)
Arithmetic Operations, Decimal Arithmetic.Jump and Call Instructions, Further Details on Interrupts. (Chapter 7and 8 from Text Book 2, Ayala)

**UNIT-III**

**Applications:** Interfacing with Keyboards, Displays, D/A and A/D Conversions, Multiple Interrupts, Serial Data Communication.
(Chapter 10 and 11 from Text Book 2, Ayala)
**Introduction to Real–Time Operating Systems:** 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.
(Chapter 6 and 7 from Text Book 3, Simon)

**UNIT-IV**

**Basic Design Using a Real-Time Operating System:** Principles, Semaphores and Queues, Hard Real-Time Scheduling Considerations, Saving Memory and Power, An example RTOS like uC-OS (Open Source);
**Embedded Software Development Tools:** Host and Target machines, Linker/Locators for Embedded Software, Getting Embedded Software into the Target System;
**Debugging Techniques:** Testing on Host Machine, Using Laboratory Tools, An Example System. (Chapter 8,9,10 & 11 from Text Book 3, Simon).

**UNIT-V**

**Introduction to advanced architectures:** ARM and SHARC, Processor and memory organization and Instruction level parallelism; Networked embedded systems: Bus protocols, I2C bus and CAN bus; Internet-Enabled Systems, Design Example-Elevator Controller. (Chapter 8 from Text Book 1, Wolf)

**Text Books:**

1. Computers as Components-principles of Embedded computer system design,
Wayne Wolf, Elseveir.
2. The 8051 Microcontroller, Third Edition, Kenneth J. Ayala, Thomson.

**Reference Books:**

1. Embedding system building blocks, Labrosse, via CMP publishers.
2. Embedded Systems, Raj Kamal, TMH.
3. Micro Controllers, Ajay V Deshmukhi, TMH.
4. Embedded System Design, Frank Vahid, Tony Givargis, John Wiley.
5. Microcontrollers, Raj kamal, Pearson Education.
6. An Embedded Software Primer, David E. Simon, Pearson Education.

**B.Tech. (CSE) Seventh Semester**
**DATA WAREHOUSING AND DATA MINING**

**Code : EURCS 702** **Category: CE**
**Credits: 4** **Hours : 4 per week**
**Department: CSE**

**UNIT-I**
**Introduction to Data Mining:** What is Data Mining, Motivating Challenges, The origins of Data Mining, Data Mining Tasks
**Data:** Types of Data, Data quality, Data Preprocessing, Measures of Similarity and Dissimilarity

**UNIT-II**

**Data Warehouse and OLAP Technology for Data Mining:**

What is a Data Warehouse? Multi-Dimensional Data Model, Data Warehouse Architecture, Data Warehouse Implementation, Development of Data Cube Technology, Data Warehousing to Data Mining.

**UNIT-III**
**Classification:** Basic Concepts, Decision Trees, and Model Evaluation
Preliminaries, General Approach to solving a classification Problem, Decision Tree, Induction, Model Overfitting, Evaluating the performance of a classifier, Rule-based Classifier, Nearest-Neighbor Classifiers, Bayesian Classifiers, Support vector Machines

**UNIT-IV**
**Association Analysis:** Basic Concepts and Algorithms, Frequent Itemset Generation, Compact Representation of Frequent Itemsets, Alternative Methods for generating Frequent Itemsets, Evaluation of Association Patterns

**UNIT-V**
**Cluster Analysis:** Basic Concepts and Algorithms, Overview, K-Means, Agglomerative Hierarchical Clustering, DBSCAN, Cluster Evaluation

**Text Books:**
1. Data Mining by Tan, Steinbach, Vipin Kumar, Pearson Education.
2. Data Mining Concepts and Techniques Jiawei Han and Micheline KamberMorgan Kaufman Publications.

**Reference Books:**

1 .Data Mining: Introductory and Advanced Topics, Margaret H Dunham, Pearson Education.
2. Data Mining, Ian H. Witten Eibe Frank, Morgan Kaufman Publications.

**B.Tech. (CSE) Seventh Semester**
**MOBILE COMMUNICATIONS**

**Code: EURCS 703** **Category: CE**
**Credits: 4** **Hours: 4 per week**
**Department: CSE**

**UNIT - I**
**Introduction to Mobile Communications and Computing :** Mobile Computing (MC) : Introduction to MC, novel applications, limitations, and architecture.
**(Wireless) Medium Access Control :** Motivation for a specialized MAC (Hidden and exposed terminals, Near and far terminals), SDMA, FDMA, TDMA, CDMA

**UNIT - II**
**GSM :** Mobile services, System architecture, Radio interface, Protocols, Localization and calling, Handover, Security, and New data services.
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**UNIT - III**
**Mobile Network Layer :** Mobile IP (Goals, assumptions, entities and terminology, IP packet delivery, agent advertisement and discovery, registration, tunneling and encapsulation, optimizations), Dynamic Host Configuration Protocol (DHCP).

**UNIT - IV**
**Mobile Transport Layer :** Traditional TCP, Indirect TCP, Snooping TCP, Mobile TCP, Fast retransmit/fast recovery, Transmission /time-out freezing, Selective retransmission, Transaction oriented TCP.

**UNIT –V**
**Wireless application Protocols:** Architecture, wireless data gram protocol, wireless transport layer protocol, wireless transaction layer protocol, wireless session layer protocol, wireless application environment.

**Text Book:**

1. Mobile Communications, Jochen H.Schiller,,second editionPearson Education.

**Reference Books :**

1. Fundamentals of Mobile and Pervasive Computing, Adelstein, Frank, Gupta, Sandeep KS, Richard III, Golden , Schwiebert, Loren, ISBN: 0071412379, McGraw-Hill Professional, 2005.
2. Principles of Mobile Computing, Hansmann, Merk, Nicklous, Stober, “”, Springer, second edition, 2003.
3. Mobile and Wireless Design Essentials,Martyn Mallick, “”, Wiley DreamTech, 2003.

**B.Tech. (CSE) Seventh Semester**
**CRYPTOGRAPHY AND NETWORK SECURITY**

**Code: EURCS 721** **Category: CE**
**Credits: 4** **Hours: 4 per week**
**Department: CSE**

**Unit-I**

Introduction to Cryptography: Introduction To Security: Attacks, Services & Mechanisms, Security, Attacks, Security Services. Conventional Encryption: Classical Techniques, Conventional Encryption Model, and Steganography, Classical Encryption Techniques. Modern Techniques: Simplified DES, Block Cipher Principles, DES Standard, DES Strength, Differential & Linear Cryptanalysis, Block Cipher Design Principles, Block Cipher ModesOf Operation.

**Unit-II**

Conventional Encryption Algorithms: Triples DES, Blowfish, International Data Encryption Algorithm, RCS, CAST-128, RC2 Placement & Encryption Function, Key Distribution, Random Number Generation, Placement Of Encryption Function.

**Unit-III**

Public Key Encryption: Public-Key Cryptography: Principles Of Public-Key Cryptosystems, RSA Algorithm, Key Management, Fermat's & Euler's Theorm, Primality, The Chinese Remainder Theorem.

**Unit-IV**

Hash Functions: Message Authentication & Hash Functions: Authentication Requirements, Authentication Functions, Message Authentication Codes, Hash Functions, Birthday Attacks, Security Of Hash Function & MACS, MD5 Message Digest Algorithm, Secure Hash Algorithm (SHA), Digital Signatures: Digital Signatures, Authentication Protocol, Digital Signature Standard (DSS), Proof Of Digital Signature Algorithm.

**Unit-V**

Network & System Security: Authentication Applications: Kerberos X.509, Directory Authentication Service, Electronic Mail Security, Pretty Good Privacy (PGP), S / Mime, Security: Architecture, Authentication Header, Encapsulating Security Payloads, Combining Security Associations, Key Management, Web Security: Secure Socket Layer & Transport Layer Security, Secure Electronic Transaction (Set), System Security: Intruders, Viruses, Firewall Design Principles, Trusted Systems.

**Text Book:**

1. Cryptography and Network Security: Principles and Practice,William Stallings, , Prentice Hall, New Jersey.

**Reference Books:**

1. Introduction to cryptography,Johannes A. Buchmann, Springer- Verlag.
2. Cryptography and Network Security,Atul Kahate, TMH

**B.Tech. (CSE) Seventh Semester**
**IMAGE PROCESSING AND PATTERN RECOGNITION**

**Code: EURCS 722** **Category: CE**
**Credits: 4** **Hours: 4 per week**
**Department: CSE**

**UNIT-I:**

**Digital Image Fundamentals**
Digital Image Definitions and Concepts, Images as Surfaces, Multi-channel Images and Color, Matlab for Image Processing,The image model and image acquisition image shape, sampling, intensify images, color images, range images, image capture, scanners, and satellite imagery.

**UNIT-II:**

**Basic (Low-Level) Digital Image Processing**
Image Enhancement: Image Enhancement in the Spatial Domain, Image Enhancement in the Frequency Domain -- Fourier Transform and Wavelet Transform, Others: Noise Removal Techniques for Image Restoration ,Geometric Operations

**UNIT-III:**

**Advanced (Mid-Level) Digital Image Processing**
Image Morphology, Introduction to Dilation and Erosion, Introduction to Opening and Closing. Introduction to Some Basic Morphological Algorithms,Image compression: Types and requirements, statistical compression, spatial compression, contour coding, quantizing compression.

**UNIT-IV:**

**Advanced (High-Level) Digital Image Processing**
Basic Image Segmentation Strategies, Data Structures for Segmentation, Watersheds and Region-Based Algorithms

**UNIT-V:**

**Pattern Recognition**
Pattern, image classification, decision surfaces. Unsupervised classification: K-means clustering, ISODATA. Supervised classification: Maximum likelihood, parallelepiped, and minimum distance to means, K-NN.Training areas and their characteristics, sampling, refinement of training data. Feature selection: Divergence analysis, Bhattacharya and Mahalanobis distance, JM distance, and separability analysis. Classification accuracy estimation, Naïve measure, Kappa, Tau indices.

**Text Books :**

1. Digital Image Processing, Rafael C. Gonzalez and Richard E. Woods. 3rd Edition, Pearson Prentice Hall, 2008.ISBN: 0-13-168728-x ,or 978-0-13-168728-8
2. Pattern classifications, Richard O. Duda, Peter E. Hart, David G. Stroke. Wiley student edition, Second Edition

**Reference Books:**

1. Pattern Recognition and Image Analysis – Earl Gose, Richard John baugh, Steve Jost PHI 2004
2. Fundamentals of speech Recognition, Lawerence Rabiner, Biing – Hwang Juang Pearson education

**B.Tech. (CSE) Seventh Semester**
**SOFT COMPUTING**

**Code: EURCS 723** **Category: CE**
**Credits: 4** **Hours: 4 per week**
**Department: CSE**

**UNIT- I**
Introduction to Soft Computing , Artificial Neural Network (ANN): Fundamentals of ANN, Basic Models of an artificial Neuron, Neural Network Architecture, Learning methods, Terminologies of ANN, Hebb network,

**UNIT- II**
Supervised Learning Networks: Perceptron, MLP, Architecture of a Back propagation Network: back propagation, Learning Effect of Tunning parameters of the Back propagation, Adaline, Madaline, RBF Network, Associative memory: Auto, hetero and linear associative memory, network, Adaptive Resonance TheoryART1, ART2, Applications

**UNIT-III**
FUZZY LOGIC : Fuzzy set theory: crisp sets, fuzzy sets, crisp relations, fuzzy relations, Fuzzy Systems: Crisp logic predicate logic, fuzzy logic, fuzzy Rule based system, Defuzzification Methods, Fuzzy rule based reasoning

**UNIT-IV**
GENETIC ALGORITHMS: Fundamentals of genetic algorithms: Encoding, Fitness functions, Reproduction. Genetic Modeling: Cross cover, Inversion and deletion, Mutation operator, Bit-wise operators, Bitwise operators used in GA. Convergence of Genetic algorithm. Applications, Real life Problems.

**UNIT-V**
Hybrid Soft Computing Techniques Hybrid system, neural Networks, fuzzy logic and Genetic algorithms hybrids. Genetic Algorithm based Back propagation Networks: GA based weight determination applications: Fuzzy logic controlled genetic Algorithms soft computing tools, Applications.

**Text Book :**

1. Principles of Soft Computing- S.N.Sivanandan and S.N.Deepa, Wiley India, 2nd Edition,2011

**Reference Book :**

1. Neuro Fuzzy and Soft Computing, J. S. R. JANG,C.T. Sun, E. Mitzutani, PHI
2. Neural Networks, Fuzzy Logicand Genetic Algorithm (synthesis and Application)S.Rajasekaran, G.A. Vijayalakshmi Pai, PH

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**B.Tech. (CSE) Seventh Semester**
**DISTRIBUTED SYSTEMS**

**Code : EURCS 724** **Category : DE**
**Credits: 4** **Hours : 4per week**
**Department: CSE**

**UNIT I**
Introduction to distributed systems, what is distributed systems? Hard ware concepts, software concepts, design issues.

Communication in distributed systems lay red protocols, ATM networks, The client-server model, remote procedure call, group communication.

**UNIT II**

Synchronization in distributed system, clock synchronization, mutual exclusion, election algorithms, atomic transaction, deadlocks in distributed systems.

**UNIT III**

Process and processors in distributed system threads, system models, processors allocation, scheduling in distributed systems, fault tolerance, real time distributed system

**UNIT IV**

Distributed file systems, distributed file system design, distributed file system implementation, trends in distributed file system.

**UNIT V**

Distributed shared memory, introduction, what is shared memory, consistency models, page based distributed shared memory, shared-variable distributed shared memory, object based distributed shared memory.

**Text Book:**

1. Distributed Operating Systems - Andrew S. Tanenbaum, PHI.

**Reference Books:**

1. Distributed Systems, Principles and paradigms, 2/E Andrew S. Tanenbaum and Maarten Van Steen**,** Prentice Hall
2. Operating Systems, Internal and Design principles,4/e, William Stallings Pearson publications.

**B.Tech. (CSE) Seventh Semester**
**DESIGN PATTERNS**

**Code: EURCS 725** **Category : DE**
**Credits: 4** **Hours : 4 per week**
**Department: CSE**

**UNIT I:**

**INTRODUCTION**
History and Origin Of Patterns- Design Patterns in MVC- Describing Design Patterns - How Design Patterns Solve Design Problems - Selecting a Design Pattern – Using a Design Pattern

**UNIT II:**

**DESIGN PATTERNS-1**
Creational -Abstract Factory-Builder-Factory Method-Prototype-Singleton

**UNIT III:**

**DESIGN PATTERNS-2**
Structural Patterns: Adapter-Bridge-Composite -Façade -Flyweight -Proxy

**UNIT IV:**

**DESIGN PATTERNS-3**
Behavioral Patterns -Chain of Responsibility –Command-Interpreter –Iterator- Mediator -Memento -Observer –State-Strategy-Template Method-Visitor
.

**UNIT V:**

**ADVANCED PATTERNS**
Pattern Catalogs and Writing Patterns, Patterns and Case Study: Designing a Document Editor
Anti-Patterns - Case Studies In UML and CORBA, Pattern Community.

**Text Books:**

1. Erich Gamma, Richard Helm, Ralph Johnson, John Vlissides,"Design patterns: Elements of Reusable object-oriented software",Addison-Wesley, 1995.
2. James W- Cooper, Addison-Wesley,"Java Design Patterns – A Tutorial", 2000.

**Reference Books:**

1. Craig Larman,"Applying UML and Patterns: An Introduction to object-oriented Analysis and Design and the unified process", Second Edition, Prentice Hall,2001.
2. Thomas Mowbray and Raphel Malveaux, " CORBA and Design Patterns ", John Wiley, 1997.
3. William J Brown et al., "Anti-Patterns: Refactoring Software, Architectures and Projects in Crisis", John Wiley, 1998.

**B.Tech. (CSE)Seventh Semester**
**INTERDEPARTMENTAL ELECTIVE - I**
**REMOTE SENSING & GEOGRAPHIC INFORMATION SYSTEMS**

**Code: EURCS 751** **Category: IE***

**Credits: 4** **Hours : 4 per week**

**UNIT-I**

Errors, global method, Local method, Edge matching, Non-topological editing, Transferring map features from one map to another.

Vector Data Analysis: Buffering and applications, Map overlay methods, Slivers, Error propagation in map Overlay, Distance measurement, Map manipulation.

**UNIT-II**

Vector Date Model: Vector data representation, topological data structure, Non-topological vector data, Higher-Level objects. Data Input, Existing GIS data, Creating new data, Remotely sensed data, GPS data, Digitizing using a digitizing table, Scanning, on-screen digitizing, Geometric Transformation, Root Mean Square Error.

Spatial Data Editing: Types of digitizing errors, Location errors, Topological errors, topological editing, Correction of digitizing emetric tinting, Perspective view, Terrain analysis, Slope and aspect, Surface curvature, View shed analysis, Grid versus TIN.

**UNIT-III**

Raster Data: Elements and types of the raster data model, GIS software-specific raster data, Raster data structure, Projection and geometric transformation of raster data, Data conversion, Integration of raster and vector data.

Rester Data Analysis: Local, Neighborhood, Zonal operations and their applications, Physical distance and cost distance measure operations and their applications, Spatial autocorrelation.

Terrain Mapping And Analysis: Data required, DEM, TIN, Terrain mapping, contouring, Vertical profiling, Hill shading, HypsoIntroduction: History of GIS, definitions of GIS, GIS terminology, GIS operations, GIS elements, GIS concepts and Practice, Spatial data, Non-spatial data, Applications of GIS and Remote Sensing, Trends in GIS, Hardware and Software requirements.

Map Projection: shape of the earth, Datum, Coordinate Systems, Basic Assumptions, Properties of map projections, Projection Types.

Non-Spatial Data: Hierarchical structure, Network structure, Relational structure, Attribute data in GIS, Linking attribute Data and Spatial Data. Attribute Data Entry.

**UNIT-IV**

Spatial Interpolation: Control Points, Trend Surface Analysis, Regression Models, Thiessen Polygons, Density Estimation, Inverse distance weighted interpolation, Thin-plate Splines, Kriging.

**UNIT-V**

GIS Models & Modeling: Binary, Index, Regression, Processing models.

Network And Dynamic Segmentation: Network Elements in GIS, Links (Resistance, Resource Demand), Turns, Stops, Facility Points, Blocks, Nodes. Network Analysis, Path Determination (Source-Destination path, optimal cyclic path), Resource allocation or distribution analysis, Utility locating or siting analysis. Dynamic Segmentation, Event Tables, Applications of Dynamic Segmentation.

**Text Book:**

1. Introduction to Geographic Information system–Kang–tusking change, Tata Mc.Graw Hill publications, New Delhi.

**Reference Books:**

1) Geographic information Systems: A management Perspective, Aronoff, S. 1989. . Ottawa: WDL publications
2) Geographic Information Systems for Geoscientists: Modeling with GIS,Bonham – Carter, G.F. 1994. . New York: Pergamon Press.
3) Principles of Geographical Information Systems,Burrough, P.A. and R.A. McDonnel. 1998. . Oxford: OxfordUniversity Press.
4) Concepts and Technologies of Geographic Information Systems Chor Pang LO., and Albert K.W. Young, Prentice hall of India (Pvt) Ltd., New Delhi.

**B.Tech. (CSE) Seventh Semester**
**SYSTEMS MODELING AND SIMULATION**

**Code: EURCS 752** **Category : IE***
**Credits: 4** **Hours : 4 per week**

**UNIT-I**

**System Models:** Concept of a system, System Environment, Stochastic activities, continuous and Discrete Systems, System Modeling, Physical and Mathematical Models for Systems, Static and Dynamic Categorization of these physical and mathematical Models. Principles used in modeling.
**System Simulation:** Monte–Carlo Method: Comparison of Simulation and analytical methods, Experimental nature, Types of Simulation, Numerical Computation Technique for continuous model and for Discrete model, Distributed Lag Models, Cobweb Models.

**UNIT-II**

**Continuous System Simulation:** Differential Equations, Analog Computers, Analog Models, hybrid Computers, digital – Analog Simulations, Continuous System Simulation Languages (CSSLS), CSMP – III, Hybrid Simulation, Feedback Systems,Interactive Systems, Real-Time Simulation.
**System Dynamics:** Exponential Growth Models, Exponential Decay Models, Logistic Curves, Generalization of Growth Models, Simple System Dynamics Diagrams, Multi-segment Models, Representation of Time Delays, WORLD Models.

**UNIT-III**

**Probability Concepts In Simulation:** Stochastic Variables, Discrete Probability functions, Continuous Probability functions, Measures of Probability functions, Numerical Evaluation of Continuous Probability functions, continuous Uniformly Distributed Random Numbers, A Uniform Random Number Generator, Generating Discrete Distributions.
**Arrival Patterns And Service Times:** Poisson's Arrival patterns, Exponential Distribution, Erlang Distribution, Hyper-Exponential Distribution, Normal Distribution, Queuing Disciplines, Mathematical Solutions of Queuing Problems.

**UNIT-IV**

**Introduction To GPSS:** GPSS Programs, General Description Action Times, Succession of Events, Choice of Paths, Simulation of a manufacturing Shop, Conditional Transfers, Control Statements, Functions, Simulation of a Super Market, Transfer modes, GPSS Model of a Simple Telephone system.

**UNIT-V**

**Random Access Systems:**
Aloha, Slotted Aloha, Carrier Sense Multiple Access, Delay Calculations in CSMA/CD, Performance comparisons, Reservation Techniques.
Routing And Flow Allocation: Routing Model, Shortest Path Algorithms, Capacity Constrains, Flow control and Routing, Routing in Practice.

**Text Books:**

1. System Simulation by Geoffrey Gordon, PHI, Second Edition.
2. Modeling and Analysis of computer Communications Networks, Jeremiah F. Hayes, Khanna Publications.

**Reference Books:**

1. System Modeling And Simulation: An Introduction,Frank L. Severence, Wiley India Ltd. 2005.
2. System Modeling And Simulation,Singh V.P, New Age International.

**B.Tech. (CSE) Seventh Semester**
**BIO MEDICAL INSTRUMENTATION**

**Code: EURCS 753** **Category : IE***

**Credits: 4** **Hours : 4 per week**

**UNIT I**

**Bioelectric Signals and Electrodes:** Origin of bioelectric signals – action potentials, Recording electrodes – Skin-contact impedance – Electrodes for ECG – electrodes for EEG – Electrodes for EMG – Electrical conductivity of electrode jellies and creams – microelectrodes.

**UNIT II**

**Physiological Transducers:** Pressure transducers, Transducers for body temperature measurement – Pulse sensors – Respiration sensors.

**UNIT III**

**Biomedical recorders:** Electrocardiograph-block diagram, ECG leads, effects of artifacts on ECG recordings; Phonocardiograph; Electroencephalograph – Eletromyograph – preamplifier, filters, delay circuits, stimulators.

**UNIT IV**

**Biomedical telemetry:** Wireless telemetry – single channel telemetry systems – Temperature telemetry system – Multichannel wireless telemetry system – Multipatient telemetry – Implantable telemetry systems – Transmission of analog physiological signals over telephone lines.

**UNIT V**

**Patient safety:** Electric shock hazards – Leakage currents – Test instruments for checking safety parameters of biomedical equipments.

**Text Books:**

1. Hand book of Biomedical Instrumentation,R.S. Khandpur, , TMH, New Delhi, 2001
2. Biomedical instrumentation and measurements,Cromwell, Weibell and Pfeiffer., , Pearson Education, 2003

**Reference Book:**

1. Medical Instrumentation application and design , John.G.Webster.,., John Wiley&sons inc., 3rd edition., 1999.

**B.Tech. (CSE) Seventh Semester**
**POWER ELECTRONICS**

**Code:EURCS 754** **Category: IE***

**Credits:4** **Hours : 4 per week**

**UNIT I**

**Power Semiconductor Switches:**
Power diodes, Power transistors – Thyristor family – SCR – Triac – GTO – Power MOSFET – IGBT – two transistor model – Gate characteristics – static and dynamic characteristics – Turn-ON-Turn-OFF methods – Series and Parallel operation of Thyristors – Gate triggering circuits – UJT as an SCR trigger – Thyristor ratings.
Protection circuits.

**UNIT II**

**Phase Controlled Rectifiers:**
Single phase and three phase – half wave – full wave – and Bridge controlled rectifiers – Dual converters – effect of load and source inductance – Natural communication.

**UNIT III**

**Choppers :**
Principle of operation, step up choppers – step down choppers – various types of choppers – Morgan – Jones – Oscillation chopper – communication circuits.

**UNIT IV**

**Inverters**
Classification – series and parallel inverters – single phase and three phase inverters – McMurray – McMurray Bedford inverter – Voltage control Harmonic reduction – current source inverters.

**UNIT V**

**AC to AC Converters:**
Principle of operation of Cyclo-converter – single phase to single phase Cyclo-converter – Cyclo-converter circuits – three phase output.Single phase and three phase voltage controllers using Thyristor and Triac – AC choppers.

**Text Books:**

1. Power Electronics, M. Rashid. PHI
2. Power Electronics, P.S. Bimbra. Khanna Publishers
3. Power Electronics, Singn M.D. and Khanchandani, TMH

**Reference Books:**

1. An introduction to Thyristors and their applications', M.Rama Murthy; East-West press.
2. Power Electronics, R.Ramshaw.
3. Thyristorised Power Controllers, Dubey., Wiley Eastern Ltd.

**B.Tech. (CSE) Seventh Semester**
**PROJECT PLANNING & MANAGEMENT**

**Code: EURCS 755** **Category: IE***

**Credits: 4** **Hours : 4 per week**

**UNIT-I**

**Introduction to Project Management:**
Introduction, Gantt Charts, Weaknesses in Gant Charts, Milestone Charts, Work Break Down Structure.

**UNIT-II**

**Project Scheduling:**
Introduction to CPM & PERT Networks, Events, Activities, Hints for Drawing Networks, Forward & Backward Planning, Numbering the Events, Single Time Estimates, Earliest Expected Time TE, A Rule for evaluating TE, Latest Allowabel Occurrence Time TL, a Rule for evaluating TL, Slack, Float, Critical Path Method, Forward Pass & Backward Pass.

**UNIT-III**

**Project Evaluation:**
Multi Time Estimates, Frequency Distribution, Mean, Variance, Standard Deviation, Probability Distribution, the Beta Distribution, Expected Time or Average Time, Probability of Achieving Completion Date, Central Limit Theorem and Application toa Network.

**UNIT-IV**

**Project Cost Analysis:**
Cost vs Time, Straight Line & Segmented Approximations, Optimum Duration, Contracting the Network.

**UNIT-V**

**Resource Allocation:** Introduction, Resource Smoothing, Resource Leveling.

**Text Book:**

1. PERT & CPM Pinciples and Applications by L.S.Srinath, East-West Press.

**Reference Books:**

1. Project Management by West & Levy, Springer.
2. Project Management: A Systems Approach to Planning, Scheduling and Controlling,Harold Kerzner, Wiley Publishers, 2010.

**B.Tech. (CSE) Seventh Semester**
**INTRODUCTION TO MICRO ELECTROMECHANICAL SYSTEMS (MEMS)**

**Code: EURCS 756** **Category: IE***

**Credits: 4** **Hours : 4 per week**

**UNIT I**

**Introduction:** History of MEMS, Overview of MEMS Processes, Properties of Silicon, A Sample MEMS Process. Definitions and Terminology, A sample Process, Lithography and Etching. (3 hrs.)
**Micromachining:** Subtractive Processes (Wet and Dry etching), Additive Processes (Evaporation, Sputtering, Epitaxial growth).
**Fundamental Devices and Processes:** Basic mechanics and electrostatics for MEMS, parallel plate actuators, pull-in point, comb drives. Electrostatic actuators; MEMS foundries, Cronos MUMPs (multi user MEMS process).

**UNIT II**

**MUMPs (Multi User MEMS Process):** JDS Uniphase MUMPs processing sequence and design rules. Design rules; applications; micro hinges and deployment actuators.
**CMOS MEMS:** CMOS foundry processes, integrated IC/MEMS, MEMS postprocessing, applications.

**UNIT III**

**Thermal Transducers:** bimorphs, "heatuators", cilia arrays.
**MicroOptoElectroMechanical Systems (MOEMS):** Micro Scanners, Digital Mirror Display, Retinal Scanning Display. Grating light valve, coroner cube retroreflector, optical switches, other micro-optical devices (5 hrs)
iezoresistivity; Scanning Probe Microscopy: scanning tunneling Microscope (STM), atomic force microscope (AFM)

**UNIT IV**

**Wireless MEMS:** mechanical and electrical resonators, Q-factor, switches, filters
**Power for MEMS:** thin film batteries, micro fuel cells, energy fields,
**MEMS Packaging and Assembly:** microassembly: serial and parallel, deterministic and stochastic; microgrippers: HexSil process; packaging techniques

**UNIT V**

**The future of MEMS:** Biomems – neural implants, gene chips, diagnostic chips; MEMS in space; mechanical computers; invisible and ubiquitous computing

**Text Books:**

1. Fundamentals of Micro fabrication: The Science of Miniaturization, Second Edition ISBN: 0849308267, CRC Press, 1997 by Marc J Madou
2. MEMS a Practical Guide of Design, Analysis, and Applications, Korvink, Jan, Paul, OliverPublishers.
3. Mechanics of Microelectromechanical Systems, Lobontiu, Nicolae, Garcia, Ephrahim, Kluwer Academic Publishers.

**Reference Books:**

1. MEMS & Microsystems,Tai-ran Hsu,TMGH 2002
2. Micro sensors, MEMS & Smart Devices,JW Gardner & VK Varadan John Wiley,

**B.Tech. (CSE) Seventh Semester**
**ENTREPRENEURSHIP**

**Code: EURCS 757** **Category: IE***
**Credits: 4** **Hours : 4 per week**

**UNIT I**
**Introduction:**
Meaning, Importance, benefits of Entrepreneurship-characterizes, factors of Entrepreneurship-Barriers of Entrepreneurship-Difference between Entrepreneurship and management-Evolution of the concept of entrepreneur-Difference between entrepreneur and entrepreneur. Motivational aspects of entrepreneur (McClelland theory)

**UNIT II**
**Project Identification And Selection:**
Meaning, classification of projects-Factors involved in project identification. Selection-significance contents, formulation of a project report – specimen of a project report-planning commission's guidelines for formulating a project-Basics of capital budgeting-Payback period. Net present value. Internal Rate of Return.

**UNIT III**

**Sources Of Finance:**

Cost of capital-importance of a capital-Basic concepts, rational assumptions-cost of debt, reference, equity capital-source of finance-internal, external sources-institutional finance to entrepreneurs and institutional support to entrepreneurs.

**UNIT IV**
**Project Appraisal:**
Concept project appraisal-Methods of project appraisal, Economic analysis, Financial analysis, Market analysis Technical feasibility and Managerial competence (assessment of working and fixed capital Govt. Policies, qualitative methods of market analysis, Life cycle segmentation).

**UNIT V**

**Ownership Structures & Evaluation of Edps:**

Ownership structures-sole trader, partnership (Partnership deed) types of partnership-Joint stock companies-Difference between private and a public company – Advantage and disadvantages of the ownership structures – Distinction between MDP and EDP – Training methods and Role playing (Games).

**Text Books:**


1. *Essentials of Management,*Harold Koontz & Heinz Weihrich. , *McGraw Hill International.*
2. *Enterpreneurship,* Hirich R.D. & Peters Irwin M.P., , *Mc Graw Hill*
3. *Developing Entrepreneurship,*Rao T.V. & Deshpande M.V., Prayag Metha, Nadakarni M.S., *Hand Book. Learning Systems.*
4. *Entrepreneurship A Contemporary Appraoch,*Donald Kurado & Hodgelts R.M.,. The Dryden Press.
5. Seven Business Crisis,Dr. Patel V.G., Tata McGraw Hill
6. New Venture Creation – Entrepreneurship for 21$^{ST}$ century,Timmons J.N., Mc Graw Hill International.


**Reference Books:**


1. A Manual on Business Opportunity Identification, Selections,Patel J.B .Nold S.S., EDH.
2. Finance for Small Scale Industries,Rao C.R..
3. A Complete GuidetoSuccessfulEntrepreneurship,PandeyM.W..VikasPublishing

**B.Tech. (CSE)Seventh Semester**
**PUBLIC ADMINISTRATION**

**Code: EURCS 758** **Category: IE***

**Credits: 4** **Hours : 4 per week**

**Unit- I**

**Basic Concepts of Public Administration**

Origin-Indian Administration; Meaning-Administration; Public Administration; Administration and Management; Nature; Scope-The POSDCORB View of Public Administration The Subject-matter View of Public Administration; Philosophy of Administration; Approaches to the Study of Public Administration-Philosophical Approach, Legal Approach, Historical Approach, The Case Method Approach; Institutional and Structural Approach, Behavioural Approach; Human Factor in Administration; Public Administration in Developed and Developing Countries.

**Public and Private Administration**

Public Administration and Private Administration under Liberalisation; Woodrow Wilson's Vision of Administration.

**Importance of Public Administration in the Modern State**

Information Technology and Public Administration; Concept of E-Goverance-Indian Experience with E-Governance; Impact of IT on Public Administration; Public Administration under New Economic Policy, 1990; Future of Discipline of Public Administration.

**Major Issues and Challenges of Public Administration in the Third World**

An Overview-The Term Explained, The Broad Profiles, The Setting and Legacy, New Trends in Public Administration, Concluding Observations.

**Unit-II**

**Principles of Organization**

Hierarchy-Features, Merits, Criticism; Span of Control; Unity of Command; Integration versus Disintegration; Centralization and Decentralization-Meaning, Advantages of Decentralization; Demerits, Advantages of Centralization, Demerits of Centralization, Evaluation; Co-ordination-Significance, Meaning, Types, How to Co-ordinate?; Hindrances to Co-ordination; Delegation-Need for Delegation, Meaning, elements, What to Delegate?, Hindrances to Delegation, How to Delegate?; Supervision-Why Supervision?, What is Supervision?, Who are Supervisors?, How to get Supervisors?, Training of Supervisors.

**Theories of Organization**

The Administrative Theory-Henry Fayol, Gulick and Urwick; Evaluation; The Scientific Management Theory-Characteristics, Principles, Criticism; The Bureaucratic Theory-Theory of Authority, Characteristics, Criticism; Mary Parker Follett-Conflict and Integration, The Giving of Orders, The Psychology of Control-Leadership, Planning and Co-ordination; Chester Barnard-The Efficiency of Co-operation, Formal and Informal Organization; The Human Relations Theory; Relative Importance of these Theories, Participative management; Behavioural Approach-Chris Argyris, Douglas McGregor's contribution, Renis Likert's contribution; The System Theory; Open and Closed Systems.

**Unit-III**

**Bureaucracy & Civil Service**

Bureaucracy-Meaning, Max Weber and Bureaucracy, Types, Maladies of Bureaucracy, Merits of Bureaucracy; Civil Service-Significance, Meaning, Functions, Qualifications, Modern Trends- (1) Numerical Strength, (2) Technicians and Technologists, (3) Increasing Powers, (4) Positive Nature of Civil Service, (5) Civil Service Neutrality; United Kingdom, United States, Other Democracies, India.

**Civil Service in India**

Introduction; All-India Services; Why All-India Services?; History of All-India Services; The Indian Administrative Services.

**Recruitment & Selection**

Importance; Problem of Recruitment-Kothari and Satish Chandra Committees on Recruitment Policy; Scheme of Competitive Examination, Union Public Service Commission, Staff Selection Commission; Reservation for Backward Classes, Scheduled Castes and Tribes-Communal Representation in Services, Anglo-Indians, Regional Representation and Linguistic Consideration.

**Promotion and Performance Appraisal**

Meaning and Importance; History of Promotion Policies in the Civil Services in India; Principles of Promotion; Performance Appraisal.

**Position Classification**

Meaning and Importance; Rank Classification-Higher Public Service under the Government of India; Duties or Position Classification.

**Unit-IV**

**Education & Training**

Objectives of Training; Types of Training-Informal, Who should be the Trainers/; What should be the 'Content' of Training?; Training in Britain; Training in India-Training for Indian Administrative Service (I.A.S.), Training for Indian Foreign Service (I.F.S.), Training for Indian Police Service (I.P.S.), Training for Indian Audit and Accounts Service (I.A. & A.S.), Training for Income Tax Service, Training Agencies in India-Railway Staff College, Baroda; The Institute of Secretariat Training and Management, New Delhi; Administrative Staff College, Hyderabad; National Institute of Rural Development; Indian School of Public Administration (1958-1968); Indian Institute of Public Administration; Other Training Institutes in India.

**Conduct and Discipline**

Need for Conduct Rules-Government Servant's conduct Rules in India, Rules of Integrity, Neutrality in Politics, Disciplinary Rules, Disciplinary Action, Types of Disciplinary Action, Mode of Taking Disciplinary Action, The Position in India, Retirement-Aims and Objects, Retirement Age, Salient Features, Forms of Retirement Systems; Pension vs. Provident Fund-Kinds of Pension, A.R.C. on Retirement Benefits; Pay and Service Conditions, The Principle of Anonymity.

**Unit-V**

**Employer-Employee Relations**

Right of Association-Right to Strike-Machinery for Negotiations-United Kingdom, United States, India; Staff Committees (Councils); Joint Consultative Machinery-The National Council, The Departmental Council, Regional and/or Office Council, conclusion.

**Leadership**

Need for Leadership, Meaning and Nature; Leadership Style-Autocratic Style, Democratic Style, Laiseez Faire Style; Functions; Qualities of Leadership; Development of Leadership; How to Select Leaders?

**Decision Making**

Significance; Meaning and Nature; Who Makes Decisions/; Bases of Decision Making; Classification; How to Make a Decision?; Problems; Decision Making and Herbert Simon.

**Text Book:**

1. Public Administration in India by Amreshwar Avasthi, Anand Prakash Avasthi, Publisher : Lakshmi Narain Agarwal

**Reference Books:**

1. Public Administration (Concepts and Theories) by S P Naidu – Publisher - New Age International Publishers.

2.Public Administration (for the UPSC and State Civil Services Preliminary Examinations) 5/E by M Laxmikanth – publisher - TATA MC Graw Hill

**B.Tech. (CSE) Seventh Semester**
**FUNDAMENTALS OF COMMUNICATION ENGINEERING**

**Code: EURCS 759** **Category: IE***

**Credits: 4** **Hours : 4 per week**

**UNIT I**

**Amplitude Modulation:** Modulation, Frequency Translation, Amplitude modulation, AM equation, Modulation index, AM generation, AM detection, Applications of linear modulation systems, Frequency division multiplexing.

**UNIT II**

**Angle Modulation:** Angle modulation, FM, modulation index, frequency deviation, NBFM, WBFM, Phase modulation, Comparison of FM and PM, Generation of FM, Phasor representation of FM and AM, FM demodulation, Pre-emphasis and De-emphasis, Comparison of AM and FM.

**UNIT III**

**Radio Transmitters & Receivers:** Classification of Radio Transmitters, AM Transmitters, FM Transmitters, Classification of Radio Receivers, TRF Receiver, Superhetrodyne Receiver, AGC.

**UNIT IV**

**Discrete Modulation Techniques:** Sampling, sampling Theorem for low pass and bandpass signals, Time Division Multiplexing, Pulse Amplitude Modulation, Pulse time modulation – Pulse Width Modulation and Pulse Position Modulation – generation and detection.

**UNIT V**

**Digital Modulation Techniques:** Pulse Code Modulation, Differential Pulse Code Modulation, Delta Modulation, Binary Amplitude Shift Keying Binary frequency Shift Keying Binary Phase Shift Keying, Differential Phase Shift Keying.

**Text Books:**

1. Electronic Communication Systems G. Kennedy, McGraw Hill
2. Communications Systems Simon Haykins, PHI.

**Reference Books:**

1. Applied Electronics and Radio Engg. GK. Mithal
2. Modern Digital and Analog Communications Systems B.P. Lathi, BSP.
3. John.G. Webster., Medical Instrumentation application and design., John Wiley & sons inc., 3rd edition., 1999.

**B.Tech. (CSE)Seventh Semester**

**EQUIPMENT IN CONSTRUCTION INDUSTRY**

**Code: EURCS 7510** **Category : IE***

**Credits: 4** **Hours : 4 per week**

**UNIT- I**

**Earth work–** Introduction, use of available equipment, suitability of job conducting, Excavation equipments, loading and lifting, transporting equipments, compacting equipments.

**UNIT-II**

**Foundation –** Introduction, blasting, Drilling, Piling, Anchoring, Drainage

**UNIT-III**

**Concreting –** Introduction, concrete mixtures, types, Concrete batching plants, vibrators, lifts, pumps, slip from shuttering

**UNIT-IV**

Steel fabrication, cutting, bending, cranes, reinforcement fabrication.

**UNIT-V**

**Miscellaneous –** Road Pavers, sand blasting, grouting, compressors, gate valves – control equipment for out let-and spillways, types of control gates.

**Text Book:**

1. Construction equipment and its planning and applications – Varma Mahesh, Metro Politin Books, New Delhi.

**Reference Books:**

1. Construction planning equipment and methods – Peurifiry R L, Led better WB, Mc Graw Hill Books Co.
2. Hydro power stations, Varshney Rs, New chand & Bros, Roorkee

**B.Tech. (CSE) Seventh Semester**
**EMBEDDED SYSTEMS LAB**

**Code: EURCS 711** **Category: CE**

**Credits: 2** **Hours : 3 per week**

**Department: CSE**

**I - Cycle**

**8051 Assembly Language and C-Programming and DSP programming with 8051 based Embedded system + PC, and DSP-µP based Embedded System + PC**

1. 8051 Assembly Language Programming Exercises using 8051 Trainer and Pentium Class PC or VT 100/220 Terminal

2. 8051 Assembly Language Programming Exercises using 8051 Trainer, ICE-51 Module, and Pentium Class PC

3. 8051 C- programming Exercises with CYGNAL kit 8051F124DK Development Kit or equivalent , Keil C51 C -Compiler, and Pentium Class PC

4. 8051 C- programming Exercises with SPJ Systems Board - SBC 51 Single Board Computer Development System or equivalent, IDE 51 C- Compiler, and Pentium Class PC

5. DSP Programming using ADSP 2181 trainer, IDE Visual DSP ++ 3.0 C-Compiler, and Pentium Class PC

6. DSP Programming using ADSP 2181 trainer, IDE Visual DSP ++ 3.0 C-Compiler, EZICE Module and Pentium Class PC

7. DSP Programming using TMS 320C6x Development System, IDE Code Composer Studio- C Compiler, and Pentium Class PC

**II CYCLE**
**I/O interface and I/O Programming with 8051-based System + Pentium Class PC**

1 Interfacing Hex Key Board and Hex Display

2. Interfacing Multiplexed Hex Display

3. Interfacing a D.M. Printer

4. Interfacing Traffic Light Control Board

5 Interfacing Stepper Motor :
a) With different speeds
b) Rotating clockwise and Anti clockwise Directions
c) Within a Given angle

**B.Tech. (CSE) Seventh Semester**

**INDUSTRIAL TRAINING**

**Code :EURCS713** **Category : IT**
**Credits: 2**

i) **50 marks are allotted for report submission and seminar presentations after completion of the training.**
ii) **50 marks are allotted for the viva-voce at the end of the semester.***

**B.Tech(CSE) Eighth Semester**
**CLOUD COMPUTING**

**Code :EURCS 821** **Category : DE**
**Credits: 4** **Hours : 4 per week**
**Department: CSE**

**Unit I:**

**Introduction to Cloud Computing:** Essentials – Benefits - Why Cloud? - Business and IT Perspective - Cloud and Virtualization - Cloud Services Requirements - Cloud and Dynamic Infrastructure - Cloud Computing Characteristics - Cloud Adoption - Cloud Models: Introduction - Cloud Characteristics - Measured Service - Cloud Models - Security in a Public Cloud - Public versus Private Clouds - Cloud Infrastructure Self Service

**Unit II:**

**Cloud as a Service:** Introduction - Gamut of Cloud Solutions - Principal Technologies - Cloud Strategy - Cloud Design and Implementation using SOA - Conceptual Cloud Model - Cloud Service Defined

**Unit III:**

**Cloud Solutions and Offerings:** Introduction - Cloud Ecosystem - Cloud Business Process Management - Cloud Service Management - Cloud Stack - Computing on Demand (CoD) - Cloud sourcing - Information Storage, Retrieval, Archive and Protection - Cloud Analytics - Testing under Cloud -Information Security-Virtual Desktop Infrastructure– Storage Cloud

**Unit IV:**

**Cloud Management :** Introduction – Resiliency – Provisioning - Asset Management - Cloud Governance - High Availability and Disaster Recovery - Charging Models, Usage Reporting, Billing and Metering

**Unit V :**

**Cloud Virtualization Technology :** Introduction - Virtualization Defined - Virtualization Benefits - Server Virtualization - Virtualization for x86 Architecture - Hypervisor Management Software - Logical Partitioning (LPAR) - VIO Server - Virtual Infrastructure Requirements - Storage virtualization - Storage Area Networks - Network-Attached storage – CloudServerVirtualization-Virtualized Data Center

**Text Book:**

1. Cloud Computing: Insight into New-Era Infrastructure,Dr. Kumar Saurabh, Wiley India Pvt. Ltd.

**Reference Book:**

1. Cloud Computing: Principles and Paradigms, Rajkumar Buyya, James Broberg, and Andrej Goscinski , John Wiley & Sons, Inc.,

**B.Tech(CSE) Eighth Semester**
**WEB SERVICES**

**Code :EURCS 822** **Category : DE**
**Credits: 4** **Hours : 4 per week**
**Department: CSE**

**UNIT I**

**Evolution and Emergence of Web Services -** Evolution of distributed computing, Core distributed computing technologies – client/server, CORBA, JAVA RMI, Micro Soft DCOM, MOM, Challenges in Distributed Computing, role of J2EE and XML in distributed computing, emergence of Web Services and Service Oriented Architecture (SOA).
**Introduction to Web Services –** The definition of web services, basic operational model of web services, tools and technologies enabling web services, benefits and challenges of using web services.

**UNIT II**

**Web Services Architecture –** Web services Architecture and its characteristics, core building blocks of web services, standards and technologies available for implementing web services, web services communication, basic steps of implementing web services, developing web services enabled applications.
**Describing Web Services –** WSDL – WSDL in the world of Web Services, Web Services life cycle, anatomy of WSDL definition document, WSDL bindings, WSDL Tools, limitations of WSDL.

**UNIT III**

**Core fundamentals of SOAP –** SOAP Message Structure, SOAP encoding, SOAP message exchange models, SOAP communication and messaging, SOAP security.
**Developing Web Services using SOAP –** Building SOAP Web Services, developing SOAP Web Services using Java, limitations of SOAP.

**UNIT IV**

**Discovering Web Services –** Service discovery, role of service discovery in a SOA, service discovery mechanisms, UDDI – UDDI Registries, uses of UDDI Registry, Programming with UDDI, UDDI data structures, support for categorization in UDDI Registries, Publishing API, Publishing information to a UDDI Registry, searching information in a UDDI Registry, deleting information in a UDDI Registry, limitations of UDDI.

**UNIT V**

**Web Services Interoperability –** Means of ensuring Interoperability, Overview of .NET and J2EE.
**Web Services Security–** XML security frame work, XML encryption, XML digital signature, XKMS structure, guidelines for signing XML documents.

**Text Books:**

1. Developing Java Web Services, R. Nagappan, R. Skoczylas, R.P. Sriganesh, WileyIndia.
2. Developing Enterprise Web Services, S. Chatterjee, J. Webber, Pearson Education.
3. XML, Web Services, and the Data Revolution, F.P.Coyle, Pearson Education.

**Reference Books :**

1. Building Web Services with Java, 2nd Edition, S. Graham and others, Pearson Education.
2. Java Web Services, D.A. Chappell & T. Jewell, O'Reilly,SPD.
3. McGovern, et al., "Java Web Services Architecture", Morgan Kaufmann Publishers, 2005.
4. J2EE Web Services, Richard Monson-Haefel, Pearson Education

**B.Tech. (CSE) Eighth Semester**
**NEURAL NETWORKS**

**Code :EURCS823** **Category : DE**
**Credits: 4** **Hours : 4 per week**
**Department: CSE**

**UNIT – I**

**Introduction:** History of neural networks, Human Brain, models of a neuron, neural networks viewed as Directed graphs, Feedback, network architectures.
**Learning process:** Error correction learning, memory–based learning, Hebbian learning, competitive learning, Boltzmann learning.

**UNIT – II**

**Single layer and multilayer perceptron :** Adaptive filtering problem, learning curves, perceptron convergence theorem, Multi layer perceptron-back propagation algorithm,XOR Problem, output representation and decision rules, Network pruning techniques.

**UNIT – III**

**Hopfield Networks:** The Hopfield network(model), Recurrent and Bidirectional associative memories, counter propagation networks, ART.

**UNIT – IV**

**Radial Basis Function Networks :** Introduction , cover's Theorem on the Separability of Patterns, Interpolation problem, Supervised learning as an III – Posed Hyper surface Reconstruction problem, Regularization Networks, Generalized Radial Basis Function Networks, XOR Problem ( revised), Approximation properties of RBF Networks.

**UNIT – V**

**Fuzzy sets,fuzzy systems,and applications:**
fuzzy set, Membership functions, Geometry of fuzzy sets, simple operations on fuzzy sets, fuzzy rules for Approximation Reasoning, Defuzzyfication, fuzzy engineering, applications.

**Text Books:**

1. Neural networks – A Comprehensive Foundation by Simon Haykin – Second Edition – Pearson Education.
2. Introduction to Aritifical Neural System, S.M.Zurada, Jaico Publishing House ( 1992)
3. Neural networks- A class room approach -SATISH KUMAR-TMH (Unit-V)

**Reference Books:**

1. Artificial Neural Networks by B. Yegnanarayana – PHI publications
2. An Introduction to fuzzy Control, by D.Driankov, H.Hellen Doorn, M.Reinfrank , Naraosa Publishing House.
3. Essential of Fuzzy Modelling and Control, R.K. Yager, D.P.Filev, John Willey & Sons, Inc NY 1994.
4. Neural Networks and Fuzzy Systems, Bart Kosko, Prentice Hall, NJ (1992)

**B.Tech. (CSE)Eighth Semester**
**NETWORK MANAGEMENT**

**Code :EURCS825** **Category : DE**
**Credits:4** **Hours : 4 per week**
**Department: CSE**

**UNIT - I:**

**Introduction:** Network Management Requirements - Network Management System.
**Network Monitoring:** Network Monitoring Architecture - Performance Monitoring - Fault Monitoring - Accounting Monitoring.
**Network Control:** Configuration Control - Security Control.

**UNIT -II**

**SNMP Network Management Concepts:** Background - Basic Concepts.
**SNMP Management Information:** Structure of management Information - Practical Issues. Standard MIB: MIB-II - Ethernet Interface MIB.
**Simple Network Management Protocol:** Basic Concepts - Protocol Specifications - Transport-level Support

**UNIT -III**

**Remote Network Monitoring: Statistics Collection:** Basic Concepts, Groups: statistics, history, host, host TopN, matrix token Ring extensions to RMON.
**Remote Network Monitoring: Alarms and Filters:** Groups: alarm, filter, packet capture, event.
**RMON2:** Overview - Protocol Directory Group - Protocol Distribution Group - Address Map Group - RMON2 Host Groups - MON2 Matrix Groups - User History Collection Groups - Probe Configuration Group

**UNIT - IV**

**SNMPv2:** Management Information : Backgroupd -Structure of Management Information
**SNMPv2:** Protocol: Protocol operations - Transport Mappings - Coexistence with SNMPv1.
**SNMPv2:** MIBs and Conformance: SNMPv2Management Information Base—Conformance Statements

**UNIT - V**

**SNMPv3:** Cryptographic Algorithms in SNMPv3: Conventional Encryption with DES - The MD5 Secure Hash Function - The SHA-1 Secure Hash Function - Message Authentication with HMAC.
**SNMPv3:** Architecture and Applications: Background - SNMPv3 Overview - SNMPv3 Architecture MIBs for SNMPv3 applications.

**Text Book:**

1. SNMP, SNMPv2, SNMPv3, AND RMON1 and 2 , William Stallings 3rd Edn., Pearson Education

**Reference Book:**

1. Network Management Principles and Practice by Mani Subramanian, Pearson Education

**B.Tech. (CSE)Eighth Semester**
**ADHOC& SENSOR NETWORKS**

**Code :EURCS826** **Category : DE**
**Credits: 4** **Hours : 4 per week**
**Department: CSE**

**UNIT I:**
**Routing:** Cellular and Ad hoc wireless networks; Issues of MAC layer and Routing; Proactive, Reactive and Hybrid Routing protocols; Multicast Routing; Tree based and Mesh based protocols; Multicast with Quality of Service Provision

**UNIT II:**
**Quality of Service:** Real-time traffic support; Issues and challenges in providing QoS; Classification of QoS Solutions; MAC layer classifications; QoS Aware Routing Protocols; Ticket based and Predictive location based Qos Routing Protocols

**UNIT III:**
**Energy Management Ad Hoc Networks:** Need for Energy Management; Classification of Energy Management Schemes; Battery Management and Transmission Power Management Schemes; Network Layer and Data Link Layer Solutions; System power Management schemes

**UNIT IV:**
**Mesh Networks:** Necessity for Mesh Networks; MAC enhancements; IEEE 802.11s Architecture; Opportunistic Routing; Self Configuration and Auto Configuration; Capacity Models; Fairness; Heterogeneous Mesh Networks; Vehicular Mesh Networks

**UNIT V:**
**Sensor Networks:** Introduction to Sensor Network architecture; Data Dissemination; Data Gathering; MAC Protocols for sensor Networks; Location discovery; Quality of Sensor Networks; Evolving Standards

**Text Book:**

1. Ad hoc Wireless Networks-Architectures and Protocols, C.Siva Ram Murthy and B.S.Manoj,,Pearson Education,2004

**Reference Books:**

1. Wireless Sensor Networks, Feng Zhao and Leonidas Guibas; Morgan Kaufman Publishers, 2004.
2. Adhoc Mobile Wireless Networks, C.K.Toh, Pearson Education, 2002.
3. Wireless Mesh Networking, Thomas Krag and Sebastin Buettrich; O'Reilly Publishers, 2007

**B.Tech. (CSE) Eighth Semester**
**SOCIAL NETWORK ANALYSIS**

**Code : EURCS 831** **Category : DE**
**Credits: 4** **Hours: 4 per week**
**Department: CSE**

**UNIT – I:**

**Networks, Relations and Structure** The Social Networks Perspective; Network Data; Boundary Specification and Sampling; Types of Networks; Network Data, Measurement and Collection

**UNIT –II:**

**Mathematical Representation of Social Networks** Graph Theoretic Notation; Sociometric Notation; Algebraic Notation; Graphs; Directed Graphs; Signed Graphs; Signed Directed Graphs; Valued Graphs; Valued Directed Graphs; Multi Graphs; Hyper Graphs; Relations; Matrices; Properties

**UNIT – III:**

**Structural and Locational Properties** Actor Centrality; Degree Centrality; Closeness Centrality; Betweenness Centrality; Information Centrality; Structural Balance; Clusterability; Generalizations of Clusterability; Transitivity

**UNIT – IV:**

**Roles and Positions** Background; Structural Equivalence; Automorphic and Isomorphic Equivalence; Regular Equivalence; Types of Ties; Local Role Equivalence; Ego Algebras

**UNIT –V:**

**Dyadic and Triadic Methods** The Dyad Census; The Example and Its Dyad Census; An Index for Mutuality; Simple Distributions on Digraphs; Conditional Uniform Distributions; The Triad Census; The Example and Its Triad Census; Mean and Variance of a Triad Census

**Text Book:**

1. Social Network Analysis – A Handbook, John Scott,SAGE Publications, 2000 (Second Edition).

**Reference Books:**

1.Social Network Analysis – Methods and Applications, Stanley Wasserman and Katherine Faust, Cambridge University Press, 1994
2.Social Network Analysis David Knoke and Song Yang ,SAGE Publications, 2008,(Second Edition
3.Introduction to Social Networks,Robert A. Hanneman and Mark Riddle.

**B.Tech. (CSE) Eighth Semester**
**OPEN SOURCE SOFTWARE DEVELOPMENT**

**Code : EURCS 832** **Category : DE**
**Credits: 4** **Hours : 4 per week**
**Department: CSE**

**UNIT I:**

**Introduction**
Overview of Open Source Software: What is software source code?, The open source Definition,Examples of OSD-compliant licenses, Examples of open source software products, The Open source software development process.
A History of open source software: The Berkeley Software Distribution,Tex, The free software foundation, GNU Unix, Linux, Apache.

**UNIT-II:**

**GNU/Unix Commands**
Unix Commands: Common Commands, Other useful commands. Operations unique to directories and files.Users and groups permissions.
Filters: Concatenating files, Sorting, GREP and its family

**Unit III:**

**PROGRAMMING GNU TOOLS**
Using the GNU Comiler collection tools: the C compiler (gcc) and the C++ compiler(g++).
Using the GNU debugging tool --Running Programs Under gdb, Compiling for Debugging, Starting your Program, Your Program's Arguments.

**UNIT IV:**

**VERSION CONTROL AND SCRIPTING**
Version Control: GIT Repositories and Branches, Developing with Git
Introduction to shell: Different types of shells, Basic script components, Expressions, Decisions.

**Unit V:**

**PYTHON PROGRAMMING**
Python Tutorial :Using the Python Interpreter, An Informal Introduction to Python, More Control Flow Tools, Data Structures, Modules, Input and Output

**Text Books:**

1. Understanding Open Source Software development By Joseph Feller, Brian Fitzgerald, Pearson Education Limited (UNIT I)
2. Unix and shell programming by Behrouz A. Forouzan, Gilberg Thomson. (Unit II)
3. Unix and shell programming by Behrouz A. Forouzan, Gilberg Thomson. (Unit IV)
4. Git User Manual: http://schacon.github.com/git/user-manual.html (Unit IV)

**Reference Books:**
1. Success of Open Source,Steve Weber
2. Producing Open Source Software,Karl Fogel

**Web Resources:**
1. Using GCC: The GNU Compiler Collection Reference Manual URL : http://shop.fsf.org/product/using-gcc-gnu-compiler-collection-reference-manual/ (Unit III)
2.Python Tutorial: http://docs.python.org/tutorial/ (Unit V
3. Using GCC, Richard Stallman et al. URL: http://www.gnu.org/doc/using.html (Unit III)
4.GDB User Manual URL: http://sourceware.org/gdb/current/onlinedocs/gdb/ (Unit III)

**B.Tech. (CSE) Eighth Semester**
**Game Programming**

**Code : EURCS 833** **Category : DE**
**Credits: 4** **Hours: 4 per week**
**Department: CSE**

**Unit- I**
Introduction to Game Programming, suitable languages for developing games and reasons, Animation framework, worms in windows and applets, full-screen worms.

**Unit- II**
Introduction to java imaging, image loading, visual effects, and animation. Loading and playing sounds, audio effects and synthesis, and Sprites.

**Unit- III**
Side- Scroller, Isometric Tile Game, 3-D check board and checkers3-D, loading and managing external models, lathe to make shapes, 3D- Sprites

**Unit- IV**
Networking basics, Network chat, networked two-person game, networked virtual environment.

**Unit- V**
Game production and project management, Game Industry roles and economics, the publisher –developer relationship, marketing, Intellectual property content, law and practice, content regulation.

**Text Books:**

1. Killer Game programming in Java, Andrew Davison, O'Reilly Publishers
2. Introduction to Game Development, Steve Rabin, CENGAGE Technology

**Reference Books:**

1. Developing Games in Java, David Brackeen
2. AI for Game Developers, David M Bourg & Glenn Seemann, O'Reilly Publishers

**Web Resources:**

1. http://www3.ntu.edu.sg/home/ehchua/programming/java/J8d_Game_Framework.html

**B.Tech. (CSE) Eighth Semester**
**BIO-INFORMATICS**

**Code :EURCS 834** **Category: DE**

**Credits: 4** **Hours : 4 per week**

**Department: CSE**

**UNIT-I:**

**Introduction:** Definitions, Sequencing, Biological sequence/structure, Genome Projects, Pattern recognition an prediction, Folding problem, Sequence Analysis, Homology and Analogy.
Protein Information resources: Biological databases, Protein pattern databases, and structure classification databases. Secondary databases, Protein pattern databases, and Structure classification databases.

**UNIT-II:**

**Genome Information resources:** DNA sequence databases, specialized genomic resources
DNA sequence analysis: Importance of DNA analysis, Gene structure and DNA sequences, Features of DNA sequence analysis, EST (Expressed Sequence Tag) searches, Gene hunting, Profile of a cell, EST analysis, Effects of EST data on DNA databases.

**UNIT-III:**

**Pair wise alignment techniques:** Database searching, Alphabets and complexity, Algorithm and programs, Comparing two sequences, sub-sequences, Identity and similarity, The Dotplot, Local and global similarity, different alignment techniques, Dynamic Programming, Pair wise database searching.

**UNIT-IV:**

**Multiple sequence alignment:** Definition and goal, The consensus, computational complexity, Manual methods, Simultaneous methods, Progressive methods, Databases of Multiple alignments and searching.
Secondary database searching: Importance and need of secondary database searches, secondary database structure and building a sequence search protocol.

**UNIT-V:**

**Analysis packages:** Analysis package structure, commercial databases, commercial software, comprehensive packages, packages specializing in DNA analysis, Intranet Packages, Internet Packages.

**Text Books:**

1. Introduction to Bioinformatics, T K Attwood & D J Parry-Smith pearson education
2. Bioinformatics – A Beginner's Guide, Jean-Michel Claveriw, Cerdric Notredame, WILEY dreamlech India Pvt. Ltd.

**Reference Books:**

1. Introduction to Bioinformatics, M. Lesk Oxford publishers (Indian Edition)
2. Bioinformatics computing Bryan Bergerar, pearson.
3. Fundamental concepts of Bio-informatic Dan E, Kranle, Pearson Education.

**B.Tech. (CSE) Eighth Semester**
**DATA ANALYTICS**

**Code :EURCS 835** **Category: DE**

**Credits: 4** **Hours : 4 per week**

**Department: CSE**

**UNIT-I:**

**Overview:** stochastic and deterministic approaches; numerical and experimental data sets;challenges in data analysis and data interpretation

**UNIT-II:**

**Linear methods of regression and classification:** linear regression and least squares; logistic regression

**UNIT-III:**

**Basis expansions and kernel methods:** piecewise polynomials; splines; kernel Hilbert spaces;local regression **Model selection and inference:** bias, variance and model complexity; Bayesian statistics;cross-validation; maximum likelihood

**UNIT-IV:**

**Analysis of chaotic and stochastic series:** exponential and power-law broad-band spectra;low-dimensional dynamical systems; infinite dimensional dynamical systems; singularitiesand exponential spectra; clustering, scaling and intermittency

**UNIT-V**

**Advanced topics:** multi-fractals; non-Brownian dynamics; non-Markovian processes;
characterization of experimental and numerical data sets

**Text Books:**

1. Elements of Statistical Learning,T. Hastie, R. Tibshirani and J. Friedman, , Springer 2001.
2. Probability and Statistics for Engineers and Scientists,A.J. Hayter, , Thompson 2002.

**Reference book:**
1. The random walk's guide to anomalous diffusion: a fractional dynamicsapproach,Metzler, R., Klafter, J.
Physics Reports, 2000.

**B.Tech. (CSE) Eighth Semester**
**PERFORMANCE EVALUATION OF COMPUTER SYSTEMS**

**Code :EURCS 836** **Category: DE**

**Credits: 4** **Hours : 4 per week**

**Department: CSE**

**UNIT I:**
**Introduction to performance evaluation** Techniques, metrics, and common mistakes Data presentation techniques, Ratio games

**UNIT II:**
**Statistical Tools:** Summarizing measured data, Basics of sampling theory, Comparing systems using sampled data, Basics of estimation theory and confidence intervals, Tests of hypotheses and significance, Parametric and non-parametric tests for goodness of fit, Regression techniques

**UNIT III:**
**Simulation:** Simulation basics and common mistakes, Transient removal and termination criteria, Random number Generation, Simulations with infinite-variance distributions

**UNIT IV:**
**Experimental design and Analysis:** Full factorial designs, full factorial designs with replications, Fractional factorial designs, one factor experiments

**UNITV:**
**Other topics:** Dealing with heavy-tailed distributions. Histograms and density estimation

**Text Book :**

1. The Art of Computer Systems Performance Analysis, Raj Jain.John Wiley and Sons, 1991.

**Reference Books:**

1. Strategies for Sound Internet Measurement, Proc V. Paxson. ACM IMC, October 2004.
2. Evidence for long-tailed distributions in the Internet Proc A. Downey. ACM IMW, October 2001.
3. Long-lasting transient conditions in simulations with heavy-tailed workloads, Proc.M. Crovella and L. Lipsky, Winter Simulation Conference 1997.
4.A Pragmatic Approach to Dealing with High-variability in Network Measurements W. Willinger, D. Alderson, L. Li, Proc. ACM IMC, October 2004.

**B.Tech. (CSE) Eighth Semester**
**INDUSTRIAL ELECTRONICS**

**Code :EURCS 851** **Category: IE***

**Credits: 4** **Hours : 4 per week**

**UNIT I**

Thyristors:
PNPN diode: Basic structure. Two transistor version, Volt – Ampere characteristic. Holdingcurrent. Temperature dependence. Rate effect, Bilateral PNPN diode switch(DLAC):Basic structure. Volt-Ampere characteristics. Silicon Controlled Rectifier (SCR): Basic structure. Two transistor Representation. Volt-Ampere characteristics. On and OFF times of gate.SCR rating. Silicon Controlled Switch (SCS): Basic structure. Two transistor equivalent. Diode transistor equivalent.
Triac: Basic structure. Volt – Ampere characteristics. Positive bias and Negative bias operations.

**UNIT II**

**Uni Junction Transistor:**
Basic structure.Potential divider equivalent Static emitter characteristics.Gate circuit of SCR. Two SCRs connected back-to-back. Delayed firing of SCR by phase shifted A.C. wave. Delayed firing of SCR by UJT.

**UNIT III**

**Plyphase Rectifiers:**
Three-phase half-wave delta-wve rectifier with resistive load.Six-phase star half-wave rectifier with resistive load. Delta-to-double wye half-wave rectifier with inter phase transformer and with resistive load. Three-phase delta-wye bridge rectifier with resistive load.General m-phase rectifier. DC power outputs, efficiencies and ripple factors, Transformer utility factor. Rectifier performance.Communication in polyphase rectifiers.

**UNIT IV**

**Resistance Welding & Heating:**
Basic circuit for a.c. resistance welding. Spot welding, Projection welding, Butt welding, Scam welding and Pulsating welding arrangements.
Induction Heating: Principle of induction heating. Applications.High frequency power source for induction heating.
Dielectric Heating: Principle of dielectric heating. Electrodes used in dielectric heating. Methods of coupling of Electrodes to R.F. Generator .Applications.

**UNIT V**

**Controller Rectifiers :**
Single-phase Controlled Rectifiers: Half-wave controlled rectifier with resistance load.
Full-wave Controlled rectifier with resistance load.Three-phase Controlled Rectifiers: Half wave controlled rectifier with resistance load, Six-Phase half-wave Controlled rectifier with resistance load.

**Electronic Speed Control Of Motors:**
DC Motor Speed Control: Methods of speed control, single phase SCR drive. Three phase SCR drives. Closed-Loop motor control system. Half-wave feedback circuit for

**Text Books:**

1. Manufacturing Technology, P.N.Rao, Tata McGraw Hill, Second Edition,2004
2. Power electronics circuits,devices and applications,2nd edition,Muhammad H Rashid,PHI
3. Utilization of Electric Power, N. V. Suryanarayana, New Age International

**Reference Books:**

1. Welding & Welding Technology,Tata McGraw Hill, Richard L Little, Nineteenth Report,1999
2. Production Technology,K.L Narayana,S.V.Ramana & P.Vamsi Krishna, Firstedition, I K Books International
3. International and Power Electronics, Harish C Rai, Umesh Publications

**B.Tech. (CSE) Eighth Semester**
**COMPTUER AIDED DESIGN**

**Code :EURCS 852** **Category: IE***

**Credits: 4** **Hours : 4 per week**

**UNIT I**

Fundamentals of CAD – Introduction – The design process- Application of computers for design – Operating systems – Hardware in CAD: The design work station – I/O Devices – CAD system configuration – Creating database for manufacturing – benefits of CAD.

**UNIT II**

Interactive Computer Graphics – Graphic display devices – Graphics system – Graphics standards – Graphical user interface – Transformation systems – windowing – clipping – 2D and 3D transformations – Linear transformation – Display files for 3D data – Geometric Modeling – Modeling Techniques – Wire frame Modeling – Surface Modeling – 3D Solid Modeling.

**UNIT III**

Introduction to finite element Analysis – CAD techniques to finite element data preparation – Automatic mesh generation – presentation of results – 3-dimensional shape description and mesh generation – CAD applications of FEM.

**UNIT IV**

CAD applications and Exposure to CAD packages: Simple examples of computer aided drafting, design and analysis – introduction to simple machine elements – Analysis of cross sectional area, centroid & moment of inertia-Kinematics of crank-slider mechanism and other simple design applications. Introduction to CAD packages like ANSYS, NASTRON and NISA – II.

**UNIT V**

Introduction to Artificial Intelligence– Applications of AI in design and CAD.

**Text Books:**

1. CAD/CAM- Computer Aided Design & Manufacturing, by M.D. Groover & E.Q.Zimmer, Pearson.
2. Computer Aided Design and Manufacturing by Dr. Sadhu Singh, Khanna Publishers.

**Reference Books:**

1. Computer Aided Design in Mechanical Engineering, by V. Rama Murthy.
2. Elements of Computer Aided Design 7 manufacturing, by Y.C. Rao,
3. Computer Aided Kinetics for Machine Design, by D.L.Ryan.
4. computer Aided Design and Manufacturing, by C.B. Besant & C.W.K. Lui.
5. computer Aided Analysis & Design by S. Ghosal, Prentice Hall of India.
6. CAD/CAM/CIM by Radhakrishna, New age international.

**B.Tech. (CSE) Eighth Semester**
**ROBOTICS & AUTOMATION**

**Code :EURCS 853** **Category: IE***

**Credits: 4** **Hours : 4 per week**

**UNIT I**
Introduction: Historical robots, robots in science fiction, future trends of robots, definitions of robots, present application status.
Robot End Effectors: Classification of end effectors, drive systems for grippers, mechanical grippers, magnetic grippers, vacuum grippers, adhesive grippers, hooks, scoops and miscellaneous devices, active and passive grippers.

**UNIT II**
Robot Drives Actuators and Control: Functions of drive system, general types of control, Pump classification, and introduction to pneumatic systems, electrical drives, DC motor and transfer function, stepper motor, drive mechanisms.

**UNIT III**
Robot Kinematics: Forward and reverse kinematics of 3 DOF arm, forward and reverse kinematics of 4 DOF arm, Homogeneous transformation, kinematics equations using homogeneous transformations.

**UNIT IV**
Robot Sensors: Need for sensing systems, types of sensor, robot vision, robot tactile syst5em, proximity sensors.

**UNIT V**
Robot applications: Capabilities of robots, material handling, machine loading and unloading, machining and fettling robot assembly, welding, future applications. Introductory concepts.

**Text Books:**

1. Robotics Technology and Flexible Automation by S.R. Deb James L. Fuller

**Reference Books:**

1. Robotics and Automation by Thomas R.Kurfess,First Edition,CSI Press
2. Industrial Robotics by Harry Colestock,First Edition,TMH

**B.Tech. (CSE) Eighth Semester**
**MECHATRONICS**

**Code :EURCS 854** **Category: IE***

**Credits: 4** **Hours : 4 per week**

**UNIT I**

**Introduction:** Multi disciplinary Scenario Origins Evolution of Mechatronics, An overview of Mechatronics, Introduction to Manufacturing Design.
**Digital logic:** Digital logic number systems, logic gates, Boolean algebra, karnaugh maps, application of logic gates, sequential logic.

**UNIT II**

**Sensors and Transducers:** Introduction and background, difference between transducer and sensor, transducers types, transduction principle, photoelectric transducers, thermistors, thermo devices, thermo couple, inductive transducers, capacitive transducers, pyroelectric transducers, piezoelectric transducers, Hall-effect transducers, Fibre optic transducers.

**UNIT III**

**Actuators:** Introduction, actuator types and application areas, electromechanical actuators, DC Motors, AC Motors - fluid power actuators – piezo electric actuators.

**UNIT IV**

**System modeling:** Introduction, system modeling, mechanical system electrical system, fluid system, thermal systems, translational mechanical system with spring, damper and mass, Rotational mechanical system with spring, damper and mass, modeling electric motor, modeling pneumatic actuator.

**UNIT V**

**Advanced Applications in Mechatronics –** Sensors for condition monitoring, mechatronic control in automated manufacturing artificial intelligence in mechatronics, fuzzy logic applications in mechatronics microsensors in mechatronics.

**Text Books:**

1. Mechatronics System Design by Devdas Shetty and Richard A. Kolk, PWS Publishing Company.
2. Mechatronics Principles concepts and applications by Nitaigour Premchand Mahalik, Tata McGraw Hill Publishing Company Ltd.

**Reference Book:**

1. Mechatronics by Bolton, Pearson Education.

**B.Tech. (CSE)Eighth Semester**
**THERMODYNAMICS**

**Code :EURCS 855** **Category: IE***

**Credits: 4** **Hours : 4 per week**

**UNIT I**
Introduction – Basic concepts – Thermodynamic systems, Micro & Macro systems – Homogeneous and heterogeneous systems – Concept of continuum – Pure substance – Thermodynamic equilibrium, State Property, Path, Process – Reversible and irreversible cycles – Energy as a property of the systems – energy in state and transition, work Heat, Point function, Path function – Heat transfer. Zeroth Law of thermodynamics – Concept of equality of temperatures – Joule's experiments

**UNIT II**
First law of thermodynamics – Corollaries – Isolated systems and steady flow systems – Specific heats at constant volume and pressure – First law applied to flow systems – systems undergoing a cycle and change of state – First law applied to steady flow processes – Limitations of first law of thermodynamics.

**UNIT III**
Perfect gas laws – Equation of state – Universal gas constant various non-flow processes – Properties of end states – Heat transfer and work transfer – change in internal energy – throttling and free expansion. Second law of thermodynamics – Kelvin Plank statement and Clausius statement and their equivalence, Perpetual motion machines of first kind and second kind – Carnot Cycle – Heat engines and heat pumps – Carnot efficiency – Clausius theorem – Clausius inequality – Concept of entropy – Principles of increase of entropy – Entropy and disorder.

**UNIT IV**
I.C. engines: Classification, comparison of two stroke and four stroke engines, comparison of SI and CI engines. Air cycles – Otto, Diesel, Dual, Stirling, Ericcson and Atkinson cycles and their analysis. Valve timing and port timing diagrams – Efficiencies – air standard efficiency, indicated thermal efficiency, brake thermal efficiency, mechanical efficiency, volumetric efficiency and relative efficiency. Testing and performances of I.C. engines.Basic principles of carburetion and fuel injection.

**UNIT V**
Refrigeration & Air Conditioning: Bell-Coleman cycle, Vapor compression cycle-effect of suction and condensing temperature of cycle performance. Properties of common refrigerants, Vapor absorption system, Electrolux refrigerator.

**TextBook:**

1. Engineering Thermodynamics, by P.K.Nag, Tata McGraw Hill Publications company.

**Reference Books:**

1. Thermal Engineering, by M.L.Mathur and F.S.Mehta, Jain Brothers.
2. Applied Thermodynamics-II by R. Yadav
3. I.C. Engines, by Mathur and Mehta
4. I.C. Engines by V Ganesan.
5. Thermal Engineering by P.L.Ballaney Khanna Publishers.

**B.Tech. (CSE) Eighth Semester**
**DIGITAL SIGNAL PROCESSING**

**Code :EURCS 856** **Category: IE***

**Credits: 4** **Hours : 4 per week**

**UNIT I**

Characterization of system is Discrete Time: Impulse response and system function H(z) of digital systems, Frequency response, Stability analysis, Direct Form-I, Direct form – II, Cascade and Parallel realization structures of digital filters, finite word length effects Limit cycle and Dead band effect.

**UNIT II**

Discrete Fourier transform (DFT): Discrete-Time Fourier transform, computation of DFT, circular convolution and linear convolution using DFT, circular convolution and linear convolution using DFT, overlap-add method, overlap-save method, Fast Fourier Transforms (FFT), Radix-2 decimation-in-time and decimation-in-frequency algorithms, Inverse FFT.

**UNIT III**

Design of IIR filters: linear phase characteristics, Fourier series method, window function technique, comparison between IIR and FIR filters.

**UNIT IV**

Design of FIR filters, linear phase characteristics, Fourier series method, window function technique, comparison between IIR and FIR filters.

**UNIT V**

DSP architecture for signal processing, Harvard architecture, pipelining, hardware multiplier, accumulator, general purpose digital signal processors, Fixed point digital processors, floating point digital signal processors.
Applications of DSP: in spectrum analysis and filtering, Application of DSP in audio applications, telecommunication and bio-medical.

**Text Book:**

1. Digital signal processing, Principles, Algorthms and Application, Oppenheim, A. V., 3rd edition. Prentice Hall India.

**Reference Books:**

1. Digital Processing – A computer based approach,Sanjay K.Mitra-, TMM.
2. Digital Signal processing – A practical approach,Itcacher E.C & Jervis B.W, , Pearson edu.

**B.Tech. (CSE) Eighth Semester**
**ELECTRONIC MEASUREMENT & INSTRUMENTATION**

**Code: EURCS 857** **Category: IE***

**Credits: 4** **Hours : 4 per week**

**UNIT I**
Measurement Instrumentation and Calibration:
Classification of transducers–performance characteristics–calibration and standards.
Signals and their representation:
Standard test–Periodic–Aperiodic–Modulated Signals–Sampled data–pulse modulation and pulse code modulation.

**UNIT II**
Dynamics of Instrument Systems:
General performance of Systems–Electromechanical systems–Fluidic systems– Filtering and dynamic compensation.

**UNIT III**
Electronic Instruments:
Digital voltmeters – Digital frequency meter – digital phase angle meter. Storage oscilloscope – analog and digital type – wave analysers – spectrum analyzers – Vector impedance meter – Q-meter-Peak reading and RMS Voltmeters.

**UNIT IV**
Transducers:
Advantages of Electrical Transducers – Classification of Transducers – characteristics and choice of Transducers – resistor – Inductor and capacitor Transducers – Strain gauge – gauge factor – types – thermistors – thermocouples – LVDT – Synchros – Peizo-Electric Transducers – Photovoltaic – Photo conductive cells – Photo diodes and Transistors.

**UNIT V**
Measurement of Non-electrical Quantities:
Measurement of Strain – Gauge sensitivity – Temperature compensation – Load cell – Measurement of Pressure using electrical transducers as secondary transducers – Vacuum Gauges – Torque measurement – Angular velocity using Tachometers and digital methods. LVDT type accelerometer – Flow measurement suing electromagnetic – hot-wire anemometer and ultrasonic types – Capacitance method for liquid level measurement.

**Text Books:**

1. Transducers and Instrumentation, DVS Murthy, Prentice-Hall of India.
2. Instrumentation: Devices and Systems, C.S. Rangan, G.R. Sarma and Mani, Tata Mc Graw-Hill, 2nd edition.
3. Modern Electronic Instrumentation and Measurement Techniques, A.D. Helfrick and W.D. Cooper, Prentice-Hall of India.

**Reference Books:**

1. Measurement Systems, Applications and Design, D.O. Deoblin.
2. Electrical and Electronics Measurements and Instrumentation, A.K. Shawnay, Dhanpatrai and Sons.
3. Process Control Instrumentation Technology, C.Johnson, Prentice-Hall of India.
4.PrinciplesofMeasurementandInstrumentation, A.S.Morris,Prentice-HallofIndia.

**B.Tech. (CSE) Eighth Semester**

**VERY LARGE SCALE INTEGRATED SYSTEMS DESIGN (VLSI)**

**Code :EURCS 858** **Category: IE***

**Credits: 4** **Hours : 4 per week**

**UNIT I**

**Review of microelectronics and Introduction to MOS technology:**

Introduction MOS and related VLSI technology – NMOS-CMOS-BICMOS-GaAas Technologies – thermal aspects of processing – production of E beam masks.

**UNIT II**

**MOS and BICMOS circuit design process:**

MOS layers – stick diagrams – design rules and layout – 2m meter – 1.2 m meter CMOS rules – Layout diagrams – Symbolic diagrams.

**UNIT III**

**Basic Circuit Concepts:**

Sheet resistance – Area capacitance of layers – delay unit – wiring capacitances – choice of layers.

**UNIT IV**

**Scaling of MOS circuits:**

Scaling models – Scaling function for device parameters – Limitation of Scaling.

Subsystem design process:

Architectural issues – switch logic – examples of structural design (Combinational logic)– design of ALU subsystem – commonly used storage elements – aspects of design rules.

**UNIT V**

**Test and Testability:**

Design for testability built in self test (BIST) – teaching combinational logic – testing sequential logic – practical design for test guide lines – scan design techniques – etc.

**Text Book:**

1. Basic VLSI Design by Douglas A, Pucknell, Kamran Eshraghian, Prantice Hall, 1996 3rd edition.

**Reference Book:**

1. Mead, C.A and Conway, L.A., Introduction to VLSI Systems, Wesley – Wesley.

**B.Tech. (CSE) Eighth Semester**
**FUNDAMENTALS OF CIVIL ENGINEERING**

**Code :EURCS 859** **Category: IE***

**Credits:4** **Hours : 4 per week**

**UNIT-I:**
**Surveying:** Classification, general principles of surveying, Basic terms and delimitations in chain, campus, leveling surveying and use of surveying.

**UNIT-II**
**Buildings Planning and Drawing :** Buildings, definitions of orientation, plan, section, Elevation and site plan, classification according to NBC, Plinth area, Floor area, carpet area, Floor space index, floor area ratio, selection of site for residential buildings. Buildings regulations and Bye Laws.

**UNIT-III**
**Building materials and Instillations:** Construction materials – stone, brick, cement, cement-mortar, concrete, steel their properties – uses, Instillations

**UNIT-IV**
**Water supply:** types of pipes, pipe appurtenances, Type of pumps, sanitation services, Lifts, Air Conditions, Electrical instillations.

**UNIT-V**
Units of measurement of different items of works in residential buildings.

**Text Books:**

1. Surveying, B.C., Punnia, Laxmi Publications (P) Ltd..
2. Planning and Designing by Gurucharan Sing, standard Publication Ltd.
3. Estimation, Costing, Specification and Valuation in Civil Engineering by M. Chakraborti., CRC Press.

**Reference Book:**

1. Principles of Surveying, Kenatkar, PuneVidyarthi Griha Prakashan.

**B.Tech. (CSE) Eighth Semester**
**ENGINEERING MATERIALS**

**Code :EURCS 8510** **Category: IE***

**Credits:4** **Hours : 4 per week**

**UNIT I**
**Metallic Materials:**
Ferrous Materials: Iron Materials, Carbon Materials, Phase Distribution, Heat Treatment of steel, Wrought iron, properties and Classification of Plain Carbon & alloy steels like Marogim Steel, Hard Field Steel, Stainless Steel, Tool Steel, cast iron and its applications.
Non-ferrous Materials: Aluminum and its applications, Copper and its applications, Nickel and its applications.

**Unit II**
**Composite Materials:**
Science: Polymer matrix Composites, Cement Matrix Composites Carbon Matrix Composites, Metal Matrix Composites, Ceramic matrix composites.
Applications: Structural applications, Electronic applications, Thermal applications, Electro chemical applications, environmental applications, Biomedical applications.

**UNIT III**
**Polymeric Materials:**
Types of polymerization, properties of Macro Molecules, Fabrication of plastics, Preparation of epoxy resins and polycarbonates, Carbon fibre reinforced Plastics, Molecular Computers, Rubbers and Elastomers.

**UNIT IV**
**Ceramic & Refractory Materials:**
Ceramics: Classification of white wears, Manufacturing of white wears, Earthen wear, Stine wear, Engineering applications of ceramics.
Refractory Materials: Classification of Refractory materials, Characteristics of refractory materials, Engineering application of refractory materials.

**UNIT V**
**Electronic Materials:**
Introduction: Metallic glasses-surface ecostic view materials-Bio metallic ceramics-Cermets-Electrets-Nano Phase Materials, Intermeterial components, SMART Materials, Conducting Polymers, Electronic detectors and Emitters, Logic Structure Materialization Technology.

**Text Books:**

1. Composite Materials Science & Applications, D.L.Chung, Deborah, Springer Publication.
2. Introduction to Physical materials, S.H.Aveneer, Tata McGraw-Hill

**Reference Books**

1. Text book of Engineering Chemistry, Sashi Chawla, Dhopatrai & Sons
2. Engineering Chemistry, S.S. Dhara

**B.Tech. (CSE) Eighth Semester**
**SOFTWARE DEVELOPMENT LAB**

**Code: EURCS 811** **Category: CE**
**Credits: 2** **Hours: 3 per week**
**Department: CSE**

Prepare the following documents for each experiment and develop the software using software engineering methodology.

1. Problem Analysis and Project Planning: Thorough study of the problem – Identify project scope, Objectives, infrastructure
2. Software Requirement Analysis: Describe the individual Phases/ modules of the project, Identify deliverables.
3. Data Modelling Use work products: data dictionary, use case diagrams and activity diagrams, build and test class diagrams, sequence diagrams and add interface to class diagrams.
4. Software Development and Debugging.
5. Software Testing: Prepare test plan, perform validation testing, coverage analysis, memory leaks, develop test case hierarchy, Site check and site monitor.

**List of Experiments:**

1. Course Registration System
2. Quiz System
3. Online ticket reservation system
4. Remote computer monitoring
5. Student marks analysing system
6. Expert system to prescribe the medicines for the given symptoms
7. ATM system
8. Platform assignment system for the trains in a railway station
9. Stock maintenance
10. E-mail Client system.

**Software Required:**

Case Tools: Rational Suite, Win runner, Empirix
Languages: C/C++/JDK 1.3,JSDK, UML
Front End: VB, VC++, Developer 2000
Back End: Oracle, MS-Access, SQL