**Department Vision**

To become the centre of excellence in computer education & research and to create the platform for industrial consultancy

**Department Mission**

- To produce globally competent and quality computer professionals by educating computer concepts and techniques.
- To facilitate the students to work with recent tools and technologies.
- To mould the students by inculcating the spirit of ethical values contributing to the societal ethics.

**Programme Educational Objectives (PEOs)**

After 4 to 6 years of completing the Programme on Bachelor of Computer Science and Engineering, the graduates will become:

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<tr>
<td>1.</td>
<td>Competent Computer/Software Engineer rendering expertise to the industrial and societal needs in an effective manner</td>
</tr>
<tr>
<td>2.</td>
<td>Sustained learner by adapting to societal change for improved career opportunities in industries, academics and entrepreneurial endeavours</td>
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<tr>
<td>3.</td>
<td>Team leader ethically committed to the profession in a multi-disciplinary environment with positive attitude towards the individual, industry and society</td>
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Programme Outcomes (POs)
During the course of the programme on Bachelor of Computer Science and Engineering the learners will acquire the ability to:

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<tr>
<th>PO No.</th>
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<tr>
<td>1.</td>
<td>Apply knowledge of mathematics, science and engineering fundamentals in computer engineering</td>
</tr>
<tr>
<td>2.</td>
<td>Design a Computer system with components and processes of desired needs within realistic constraints such as economics, environmental, social, political, ethical, health and safety.</td>
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<tr>
<td>3.</td>
<td>Identify and modify the functions of the internal software components such as operating systems and compilers</td>
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<td>Apply Software Engineering principles, techniques and tools for software development</td>
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<td>5.</td>
<td>Acquire programming skills for application development in real-world problem solving</td>
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<tr>
<td>6.</td>
<td>Create, collect, process, view, organize, store, mine and retrieve data in both local and remote locations in a secure and effective manner</td>
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<tr>
<td>7.</td>
<td>Design and conduct experiments, as well as to analyze and interpret data laying foundation for solving complex problems</td>
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<tr>
<td>8.</td>
<td>Develop project management techniques and to work in team for successful reach of information to the end users</td>
</tr>
<tr>
<td>9.</td>
<td>Create technical reports, presentations, for effective communication.</td>
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<tr>
<td>10.</td>
<td>Participate and succeed in various competitive examinations</td>
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<tr>
<td>11.</td>
<td>Realize professional and ethical responsibility and act in accordance to social welfare</td>
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<td>12.</td>
<td>Engage in life-long learning acquiring knowledge of contemporary issues so as to face the career challenges</td>
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<td>13.</td>
<td>Apply the skills and techniques in computer engineering and inter-disciplinary domains for providing solutions in a global, economic, environmental, and societal context</td>
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**CURRICULUM (I TO VIII SEMESTER)**

**SEMESTER I (Common to all UG Programmes)**

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**PRACTICAL**

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<td>7.</td>
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<td>Computer Graphics and Multimedia Laboratory</td>
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**SEMESTER VIII**

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**TOTAL NO. OF CREDITS: 191**

**ELECTIVE I (Electives without Lab Component)**

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<td>1.</td>
<td>13MA902</td>
<td>Combinatorics and Graph Theory</td>
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ELECTIVE II (Electives without Lab Component)

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<td>Human Computer Interaction (Common to CSE / IT)</td>
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<td>1.</td>
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## OPEN ELECTIVES

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<th>Sl. No.</th>
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Course Objectives:

- To enable the students of Engineering and Technology build up vocabulary
- To improve grammatical accuracy
- To develop language functions
- To understand the basic nuances of language

Course Outcomes:

- The students of Engineering and Technology will be able to build up their vocabulary
- Grammatical accuracy will be improved
- Language functions will be developed
- The basic nuances of language will be understood

UNIT I

Listening - Introducing learners to GIE - Types of listening - Listening to audio (verbal & sounds); Speaking - Speaking about one’s place, important festivals etc. – Introducing oneself, one’s family / friend; Reading - Skimming a reading passage – Scanning for specific information - Note-making; Writing - Free writing on any given topic (My favourite place / Hobbies / School life, etc.) - Sentence completion - Autobiographical writing (writing about one’s leisure time activities, hometown, etc.); Grammar - Prepositions - Reference words - Wh-
questions - Tenses (Simple); Vocabulary - Word formation - Word expansion (root words / etymology); E-materials - Interactive exercises for Grammar & Vocabulary - Reading comprehension exercises - Listening to audio files and answering questions.

**UNIT II**

Listening - Listening and responding to video lectures / talks; Speaking - Describing a simple process (filling a form, etc.) - Asking & answering questions - Telephone skills – Telephone etiquette; Reading – Critical reading - Finding key information in a given text - Sifting facts from opinions; Writing - Biographical writing (place, people) – Process descriptions (general / specific) - Definitions – Recommendations; Instruction; Grammar - Use of imperatives - Subject-verb agreement; Vocabulary - Compound words - Word Association; E-materials - Interactive exercises for Grammar and Vocabulary - Listening exercises with sample telephone conversations / lectures – Picture-based activities.

**UNIT III**

Listening - Listening to specific task - focused audio tracks; Speaking - Role-play – Simulation - Group interaction - Speaking in formal situations (teachers, officials, foreigners); Reading - Reading and interpreting visual material; Writing - Jumbled sentences - Coherence and cohesion in writing - Channel conversion (flowchart into process) - Types of paragraph (cause & effect / compare & contrast / narrative / analytical) - Informal writing (letter/e-mail/blogs) - Paraphrasing; Grammar - Tenses (Past) - Use of sequence words - Adjectives; Vocabulary - Different forms and uses of words, Cause and effect words; E-materials - Interactive exercises for Grammar and Vocabulary - Excerpts from films related to the theme and follow up exercises - Pictures of flow charts and tables for interpretations

**UNIT IV**

Listening - Watching videos / documentaries and responding to questions based on them; Speaking - Responding to questions - Different forms of interviews - Speaking at different types of interviews;
Reading - Making inference from the reading passage - Predicting the content of a reading passage; Writing - Interpreting visual materials (line graphs, pie charts etc.) - Essay writing – Different types of essays; Grammar - Adverbs – Tenses – future time reference; Vocabulary - Single word substitutes - Use of abbreviations & acronyms; E-materials - Interactive exercises for Grammar and Vocabulary - Sample interviews – film scenes - dialogue writing.

UNIT V

Listening - Listening to different accents, Listening to Speeches/Presentations, Listening to broadcast & telecast from Radio & TV; Speaking - Giving impromptu talks, Making presentations on given topics; Reading - Email communication - Reading the attachment files having a poem/joke/proverb - Sending their responses through email Writing - Creative writing, Poster making; Grammar - Direct and indirect speech; Vocabulary - Lexical items (fixed / semi fixed expressions); E-materials - Interactive exercises for Grammar & Vocabulary - Sending emails with attachment – Audio / video excerpts of different accents, - Interpreting posters.

TOTAL: 60 PERIODS

TEXTBOOKS:


REFERENCE BOOKS:


Extensive reading:

13BS101: MATHEMATICS I
(Common to all UG Programmes) 3 1 0 4

Course Objectives:
- To develop the use of matrix algebra techniques this is needed by engineers for practical applications
- To make the student knowledgeable in the area of infinite series and their convergence so that he/ she will be familiar with limitations of using infinite series approximations for solutions arising in mathematical modeling
- To familiarize the student with functions of several variables. This is needed in many branches of engineering
- To introduce the concepts of improper integrals, Gamma, Beta and Error functions which are needed in engineering applications
- To acquaint the student with mathematical tools needed in evaluating multiple integrals and their usage

Course Outcomes:
At the end of the course students are able to
- Expertise matrix algebra
- Apply tests of convergence
- Understand and apply functions of several variables
- Evaluate integrals using Beta and Gamma function
- Expertise multiple integrals and their usage

UNIT 0 (Not for Examination) 5+0
Basic concepts on limits, continuity, derivative & integrals of a single variable

UNIT I MATRICES

9+3

Eigenvalues and Eigenvectors of a real matrix – Characteristic equation

UNIT II INFINITE SERIES

9+3


UNIT III FUNCTIONS OF SEVERAL VARIABLES

9+3


UNIT IV IMPROPER INTEGRALS

9+3

Improper integrals of the first and second kind and their convergence – Evaluation of integrals involving a parameter by Leibnitz rule – Beta and Gamma functions – Properties – Evaluation of integrals using Beta and Gamma functions – Error functions

UNIT V MULTIPLE INTEGRALS

9+3

TEXT BOOKS:

REFERENCE BOOKS:
3. Allen Jeffrey, “Advanced Engineering Mathematics”, Academic press publications, Elsevier India, First edition 2003 (For unit 0-Section 1.8,1.9,1.11)

13BS102: ENGINEERING PHYSICS L T P C
(Common to all UG Programmes) 3 0 0 3

Course Objectives
• To impart sound knowledge about basic concepts of physics.
• To introduce the basic physics concepts relevant to different branches of Engineering and Technology
• To introduce the fundamentals of physics and its applications in engineering.

Course Outcomes:
• The students will be able to understand the elastic properties of the materials.
The students will acquire knowledge about solid state physics.

The students will acquire knowledge about the basic concepts of physics in the topics such as acoustics, ultrasonics, thermal physics, and applied optics.

UNIT I   PROPERTIES OF MATTER


UNIT II   ACOUSTICS AND ULTRASONICS


UNIT III   THERMAL PHYSICS


UNIT IV   APPLIED OPTICS

UNIT V  SOLID STATE PHYSICS

Nature of bonding - growth of single crystals (qualitative) - unit cell, crystal systems, Bravais space lattices - crystal planes and directions, Miller indices - expressions for interplanar distance - coordination number and packing factor for simple structures: SC, BCC, FCC and HCP - structure and significance of NaCl, ZnS, diamond and graphite - crystal imperfections: point defects, dislocations and stacking faults.

TOTAL: 45 PERIODS

TEXTBOOKS:


REFERENCE BOOKS:


Course Objectives:
To make the students familiar with
- The treatment of water for potable and industrial purposes.
- The principles of electrochemistry, electrochemical cells, emf and applications of emf measurements.
- The principles of corrosion and corrosion control techniques.
- Different types of fuels and combustion.
- Different materials and their engineering applications.

Course Outcomes:
At the end of the course the student will be able to
- Understand the basic principles of water quality parameters, their analysis and various water treatment processes for domestic and industrial applications.
- Understand the basic principles of electrochemistry and its applications.
- Know the principles, various types of corrosion and corrosion control techniques.
- Have a sound knowledge on various engineering materials and their industrial applications.
- Have a sound knowledge on different types of fuels.

UNIT I  WATER TECHNOLOGY
carbonte and calgon conditionings) – Domestic water treatment – disinfection methods (Chlorination, Ozonation. UV treatment) – break point chlorination – Salinity – desalination by reverse osmosis.

UNIT II ELECTROCHEMISTRY


UNIT III CORROSION AND ITS CONTROL


UNIT IV ENGINEERING MATERIALS

Refractories – classification – acidic, basic and neutral refractories – properties (refractoriness, refactororiness under load, dimensional stability, porosity, thermal spalling) – manufacture of alumina, magnesite and zirconia bricks.

Lubricants – mechanism of lubrication, liquid lubricants – properties (viscosity index, flash and fire points, cloud and pour points, oiliness) – solid lubricants – graphite and molybdenum disulphide – semi solid lubricants and emulsions.

Nanomaterials – introduction to nano chemistry – carbon nanotubes and their applications.
UNIT V  FUELS AND COMBUSTION


TOTAL: 45 PERIODS

TEXT BOOKS:


REFERENCES:


13GE101: ENGINEERING GRAPHICS

(List Common to all UG Programmes)

L T P C
2 0 4 4

Course Objectives:

• To gain knowledge on the basics of Engineering Drawing construction procedures.

• To understand the principles involved in graphic skill for communication of concepts, ideas and design of Engineering products.
• To draw the drawing of various solids.
• To expose the above to existing national standards related to technical drawings.
• An ability to draw the drawing for any given object to the required standard.

Course Outcomes:
• Sketch multiple views of Engineering components
• Create the projection of point, straight line and plane
• Project the solid objects
• Section the solid
• Develop lateral surfaces of solids
• Apply isometric and perspective projections

Concepts and Conventions
(Not for Examination)

Importance of graphics in engineering applications – Use of drafting instruments – BIS conventions and specifications – Lettering and Dimensioning-Size, layout and folding of drawing sheets.

UNIT I Plane Curves and Pictorial Views to Orthographic Views

Geometrical Constructions like bisection of a straight line, division of a straight line into n equal parts, bisection of angles, Curves used in engineering practices: Conics – Construction of ellipse, parabola and hyperbola by eccentricity method – Construction of cycloid – construction of involutes of square and circle – Drawing of tangents and normal to the above curves.

Orthographic projection – principles – Principal planes- Representation of Three Dimensional objects – Layout of views– Sketching of multiple views (Front, Top and Side views) from pictorial views of simple objects and Engineering Components.

UNIT II Projection of Points, Lines and Plane Surfaces
First Angle projection–projection of points in four quadrants. Projection of straight lines (only First angle projection) inclined to both the principal planes – Determination of true lengths and true inclinations by rotating line method and traces.

Projection of planes (polygonal and circular surfaces) inclined to both the principal planes by change of position method.

UNIT III  Projection of Solids  14

Projection of simple solids like prisms, pyramids, cylinder and cone when the axis is inclined to one of the principal planes by change of position method.

UNIT IV  Section of Solids and Development of Lateral Surfaces of Solids  14

Sectioning of above solids in simple vertical position when the cutting plane is inclined to the one of the principal planes and perpendicular to the other – obtaining true shape of the section.

Development of lateral surfaces of simple solids – Prisms, pyramids, cylinders and cones. Development of lateral surfaces of sectioned solids and simple applications like funnel.

UNIT V  Isometric and Perspective Projections  14


Perspective projection of simple solids–Prisms, pyramids and cylinders by visual ray method.

TOTAL: 75 PERIODS

TEXT BOOKS:


REFERENCE BOOKS:


Publication of Bureau of Indian Standards:


Special points applicable to End Semester Examinations on Engineering Graphics:

1. There will be five questions, each of either or type covering all units of the syllabus.

2. All questions will carry equal marks of 20 each making a total of 100.
3. The answer paper shall consist of drawing sheets of A3 size only. The students will be permitted to use appropriate scale to fit solution within A3 size.

4. The examination will be conducted in appropriate sessions on the same day

13GE102: COMPUTER PROGRAMMING  L T P C
(Common to all UG Programmes)  3 0 0 3

Course Objectives:

- To gain knowledge on the basic concepts of a computer system
- To get acquainted with the method of number system conversion
- To learn how to write modular and readable C program
- To learn to use pointers for storing data in the main memory efficiently
- To exploit the notion of derived data types

Course Outcomes:

- Extrapolate the basics about computer
- Recognize different types of number systems as they relate to computers.
- Develop modular C programs for a given problem
- Explicitly manage memory using pointers
- Capable of grouping different kinds of information related to a single entity
- Store a large homogeneous data and record like data
- Process a text data
- Store the data for future use in structured and unstructured format

UNIT I  COMPUTER FUNDAMENTALS  9
Generation and Classification of Computers - Basic Organization of a Computer - Hardware - Classification of computer software – Number System: Binary, Decimal, Hexadecimal, Octal, and Conversion –
Problem Solving Techniques: Introduction to Algorithm, Pseudo code, Flow Chart – Case Studies

UNIT II  C – DATATYPES AND STATEMENTS  10
Structure of a ‘C’ program, compilation and linking processes - C Tokens: Constants, Variables – Data Types: Primitive Data Types, Type Definition, Enumeration, Qualifiers, Storage classes – Operators and Expressions - Managing Input and Output operations – Decision Making: Branching statements, Looping statements-Problem Solving with Basic statements

UNIT III  ARRAYS AND STRINGS  8
Arrays: Declaration, Initialization, One dimensional, Two dimensional, and Multidimensional arrays - String: String operations – Manipulating String Arrays –Problem Solving with Arrays and Strings

UNIT IV  FUNCTIONS AND POINTERS  9
Function : Declaration, Definition, Parameter passing methods, Recursion – Pointers: Declaration, Definition, Pointers and Functions, Pointer arithmetic, Pointer to an Array, Array of Pointers, Pointer to Pointer, Pointer to Void (generic pointer), Pointer to function - Dynamic Memory Allocation - Problem Solving with Functions and Pointers

UNIT V  STRUCTURES, UNIONS AND FILE HANDLING  9
Structure: Need for Structure, Declaration, Definition, Array of Structures, Pointer to Structure, Structure within a Structure, Structures and functions, Bit fields in Structure –Structures and Union - Files: File Management functions, Working with Text Files, and Binary Files -Pre-processor directives - Problem Solving with Structures, Unions and Files

TOTAL: 45 PERIODS

TEXT BOOKS:

REFERENCE BOOKS:

WEB REFERENCES:
1. www.w3schools.in/c-programming-language

13BS151: PHYSICS AND CHEMISTRY LABORATORY  
(Classes on Alternate Weeks for Physics and Chemistry Laboratory)  
L T P C 0 0 3 2

Course Objectives:
- To have a study on determination of rigidity modulus and Young’s modulus
- To be familiar with finding thickness of a thin paper
- To deal with the determination of ultrasonic velocity
- To have a study on estimation of hardness and alkalinity of water
- To deal with Conductometric titration and Potentiometric titration

Course Outcomes:
• Find moment of inertia of disc and rigidity modulus of wire
• Determine thickness of a thin sheet of paper
• Find thermal conductivity of bad conductor
• Estimate hardness and alkalinity of water sample
• Do conductometric titration and Potentiometric titration
• Find corrosion rate

LIST OF EXPERIMENTS FOR PHYSICS LABORATORY
(Any FIVE Experiments)
1. Torsional pendulum – Determination of rigidity modulus of wire and moment of inertia of disc
2. Non-uniform bending- Young’s modulus determination
3. Air-wedge- Determination of thickness of a thin sheet of paper
4. Spectrometer- Determination of wavelength of Hg spectrum using grating
5. Viscosity of liquids- Determination of co-efficient of viscosity of a liquid by Poiseuille’s method
6. Lee’s disc-Determination of thermal conductivity of bad conductor

REFERENCE
1. Physics Laboratory Manual, Department of Physics, Mepco Schlenk Engineering College, Sivakasi.

LIST OF EXPERIMENTS FOR CHEMISTRY LABORATORY
(Any FIVE Experiments)
1. Estimation of hardness of water by EDTA method
2. Estimation of alkalinity of water sample
3. pH-metric titration (acid & base)
4. Conductometric titration (strong acid vs strong base)
5. Conductometric titration (mixture of acids vs strong base)
6. Potentiometric titration between ferrous ion and potassium dichromate
7. Determination of corrosion rate by weight loss method

REFERENCES


TOTAL: 45 PERIODS

13GE151: ENGINEERING PRACTICES

LABORATORY

(Common to all UG Programmes)

Course Objectives:

- To provide exposure to the students with hands on experience on various basic engineering practices in Civil, Mechanical, Electrical and Electronics Engineering.
- To have a study and hands-on-exercise on plumbing and carpentry components.
- To have a practice on gas welding, foundry operations and fitting
- To have a study on measurement of electrical quantities, energy and resistance to earth.
- To have a practice on soldering

Course Outcomes:

- Do pipe connections with different joining components.
- Create joints for roofs, doors, windows and furniture
- Prepare square fitting and vee fitting models
- Do residential house wiring
- Measure energy and resistance to earth of an electrical equipment
• Apply soldering

GROUP A (CIVIL & MECHANICAL)

I CIVIL ENGINEERING PRACTICE

Buildings:
Study of plumbing and carpentry components of residential and industrial buildings, Safety aspects.

Plumbing Works:
1. Study of pipeline joints, its location and functions: valves, taps, couplings, unions, reducers, and elbows in household fittings.
2. Study of pipe connections requirements for pumps and turbines.
3. Preparation of plumbing line sketches for water supply and sewage works.
5. Demonstration of plumbing requirements of high-rise buildings.

Carpentry using Power Tools only:
1. Study of the joints in roofs, doors, windows and furniture.
2. Hands-on-exercise: Wood work, joints by sawing, planning and cutting.

II MECHANICAL ENGINEERING PRACTICE

Welding:
Preparation of arc welding of butt joints, lap joints and tee joints.

Basic Machining:
1. Simple Turning, Step turning
2. Drilling Practice using drilling machine.

Sheet Metal Work:
1. Forming & Bending:
2. Model making – Trays, funnels, etc.
3. Different type of joints.
Machine assembly practice:
1. Study of centrifugal pump
2. Study of air conditioner

Demonstration on:
1. Gas welding practice
2. Smithy operations, upsetting, swaging, setting down and bending.
   Example – Exercise – Production of hexagonal headed bolt.
3. Foundry operations like mould preparation for gear and step cone pulley.

GROUP B (ELECTRICAL AND ELECTRONICS)

III ELECTRICAL ENGINEERING PRACTICE
1. Residential house wiring using switches, fuse, indicator, lamp and energy meter.
2. Fluorescent lamp wiring.
3. Stair case wiring
5. Measurement of energy using single phase energy meter.

IV ELECTRONICS ENGINEERING PRACTICE
1. Study of Electronic components and equipments – Resistor, colour coding measurement of AC signal parameter (peak-peak, rms period, frequency) using CRO.
2. Study of logic gates AND, OR, EXOR and NOT.
4. Soldering practice – Components Devices and Circuits – Using general purpose PCB.
5. Measurement of ripple factor of HWR and FWR.
REFERENCE BOOKS:


SEMESTER EXAMINATION PATTERN

The Laboratory examination is to be conducted for Group A & Group B, allotting 90 minutes for each group, with a break of 15 minutes. Both the examinations are to be taken together in sequence, either in the FN session or in the AN session. The maximum marks for Group A and Group B lab examinations will be 50 each, totaling 100 for the Lab course. The candidates shall answer either I or II under Group A and either III or IV under Group B, based on lots.

List of equipment and components

(For a Batch of 30 Students)

CIVIL ENGINEERING

1. Assorted components for plumbing consisting of metallic pipes, plastic pipes, flexible pipes, couplings, unions, elbows, plugs and other fittings. 15 Sets.

2. Carpentry vice (fitted to work bench) 15 Nos.


4. Models of industrial trusses, door joints, furniture joints 5 each

5. Power Tools:

TOTAL: 45 PERIODS
(a) Rotary Hammer 2 Nos.
(b) Demolition Hammer 2 Nos.
(c) Circular Saw 2 Nos.
(d) Planer 2 Nos.
(e) Hand Drilling Machine 2 Nos.
(f) Jigsaw 2 Nos.

MECHANICAL ENGINEERING
1. Arc welding transformer with cables and holders 5 Nos.
2. Welding booth with exhaust facility 5 Nos.
3. Welding accessories like welding shield, chipping hammer, wire brush, etc. 5 Sets.
4. Oxygen and acetylene gas cylinders, blow pipe and other welding outfit. 2 Nos.
5. Centre lathe 10 Nos.
7. Hearth furnace, anvil and smithy tools 2 Sets
8. Moulding table, foundry tools 2 Sets
10. Study-purpose items: centrifugal pump, air-conditioner 1 each.

ELECTRICAL
1. Assorted electrical components for house wiring 10 Sets
2. Electrical measuring instruments 15 Sets.
3. Study purpose items: Iron box, fan and regulator, emergency lamp 1 each
5. Power Tools: (a) Range Finder 2 Nos. 
(b) Digital Live-wire detector 2 Nos.

ELECTRONICS
1. Soldering guns 10 Nos.
2. Assorted electronic components for making circuits 50 Nos.
3. Small PCBs 10 Nos.
5. Study purpose items: Telephone, FM radio, low-voltage power supply 2 Nos.

13GE152: COMPUTER PRACTICES LABORATORY L T P C 0 0 3 2
(Common to all UG Programmes)

Course Objectives:
- To develop C programs using conditional and looping statements
- To expertise in arrays and strings
- To build modular programs
- To explicitly manage memory using pointers
- To group different kinds of information related to a single entity
- To visualize and present data using office packages

Course Outcomes:
- Implement program using control statements
- Handle arrays and strings
- Develop reusable modules
- Store data in main memory effectively using pointers
- Form heterogeneous data using structures
- Use office packages for documentation and presentation

SYLLABUS FOR THE LABORATORY:
1. Programs using simple statements
2. Programs using decision making statements
3. Programs using looping statements
4. Programs using one dimensional and two dimensional arrays
5. Solving problems using string functions
6. Programs using user defined functions and recursive functions
7. Programs using pointers
8. Programs using functions and pointers
9. Programs using structures and unions
10. Word Processing
    - Document Creation, Text Manipulation with Scientific Notation
    - Table creation, Table formatting and Conversion.
    - Mail merge and Letter preparation.
    - Drawing - Flow Chart
11. Spread Sheet
    - Chart - Line, XY, Bar and Pie.
    - Formula - formula editor.
    - Inclusion of object, Picture and graphics, protecting the document and sheet.
12. PowerPoint Presentation- Slides preparation using templates and animation

TOTAL: 45 PERIODS

REFERENCE BOOKS:

WEB REFERENCES:
1. http://www.w3schools.in/c-programming-language
List of Sample Exercises

1. A company XYZ pays their employers on a monthly basis. It pays their employers with DA=50% of BP, HRA=10% of BP, allowance=Rs.1000. The company needs to automate the salary computation based on the basic pay. Develop an application to compute the gross salary of an employee given their basic pay.

2. Collecting money becomes increasingly difficult during periods of recession, so companies may tighten their credit limits to prevent their accounts receivable (money owed to them) from becoming too large. In response to a prolonged recession, one company has cut its customers’ credit limits in half. Thus, if a particular customer had a credit limit of $2000, it’s now $1000. If a customer had a credit limit of $5000, it’s now $2500. Write a program that analyzes the credit status of a customer. For each customer you’re given:
   - The customer’s account number
   - The customer’s credit limit before the recession
   - The customer’s current balance (i.e., the amount the customer owes the company).

Your program should calculate and print the new credit limit for the customer and should determine and print whether customer has current balance that exceeds their new credit limits.

3. A right triangle can have sides that are all integers. The set of three integer values for the sides of a right triangle is called a Pythagorean triple. These three sides must satisfy the relationship that the sum of the squares of two of the sides is equal to the square of the hypotenuse. Find all Pythagorean triples for side1, side2, and the hypotenuse all no larger than 500. Use a triple-nested for loop that simply tries all possibilities ($hypotenuse^2 = side1^2 + side2^2$).
4. Write a program that simulates the rolling of two dice. The program should use rand to roll the first die, and should use rand again to roll the second die. The sum of the two values should then be calculated. [Note: Since each die can show an integer value from 1 to 6, then the sum of the two values will vary from 2 to 12]. Your program should roll the two dice 1,000 times. Store the numbers of times each possible sum appears and print the results in a tabular format.

5. Dates are commonly printed in several different formats in business correspondence. Two of the more common formats are 07/21/2003 and July 21, 2003. Write a program that reads a date in the first format and prints it in the second format.

6. A banking application need to be developed for a bank. The operational features contain a list of the transactions that can be performed. These transactions are as follows:
   - Deposit funds to an account (required info.: checking/savings, amount)
   - Withdraw funds from an account (required info.: checking/savings, amount)
   - Transfer funds from one account to another (required info.: checking/savings, amount, other account number, other checking/savings)
   - Query the balance of any account (required info.: checking/savings)

   Develop an application to automate the above operational features.

7. A class contains a total strength of 50 in which there 20 girls and 30 boys. The department needs to assign roll number for the students based on their names in alphabetical order. Develop a software to automate the task.

8. A journal publication company wants to automate the review process. The software should check for the number of prepositions and conjunctions. If the count exceeds 30% of the content then it
should reject the paper. Develop the software.

9. A telephone directory contains information such as name, phone number and address. For advertising a product a company needs software to get the phone number of the people in a specific location and display their name and phone number in sorted order.

10. **Word:**

   i) Create a new word document named ‘Student Record’ and
   
   - Set left margin at 1.8” and right margin at 1.3”.
   - Your heading should be in Times New Roman, Bold and Italic with size 12.
   - Include the Page number at the top of every page
   - Type your personal details.
   - Table with details of 10 students with the following fields: Student name, Department, Internal, External, total, result, Examination held.

   ii) Create a word document named “Scientific Notation” and type one paragraph about the Equation editor with font size 10, and in ‘Calibri’ format. Apply page set up with line spacing of 1 and type the following equations

   \[ x = \frac{-b \pm \sqrt{b^2-4ac}}{2a} \]

   \[ \int x^n dx = \frac{x^{n+1}}{n+1} \]

   iii) Create an interview call letter as the main document and create 10 records for 10 persons. Use mail merge to create letters for the 10 persons.

   iv) Draw the flowchart using Open Office Write for checking whether the given number is Armstrong or not and to find the product of digits of a number.

11. **Excel**

   a) The following table shows the average number of vehicles per
hour for a week. Create Bar Graph, 3D and Pie Chart for the following:

<table>
<thead>
<tr>
<th>Day</th>
<th>Cars</th>
<th>Buses</th>
<th>Two-Wheelers</th>
<th>Other Vehicles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monday</td>
<td>1486</td>
<td>700</td>
<td>595</td>
<td>2100</td>
</tr>
<tr>
<td>Tuesday</td>
<td>1210</td>
<td>575</td>
<td>423</td>
<td>1821</td>
</tr>
<tr>
<td>Wednesday</td>
<td>1197</td>
<td>562</td>
<td>456</td>
<td>1731</td>
</tr>
<tr>
<td>Thursday</td>
<td>1234</td>
<td>432</td>
<td>500</td>
<td>1927</td>
</tr>
<tr>
<td>Friday</td>
<td>1372</td>
<td>628</td>
<td>512</td>
<td>2021</td>
</tr>
<tr>
<td>Saturday</td>
<td>1637</td>
<td>843</td>
<td>612</td>
<td>2348</td>
</tr>
<tr>
<td>Sunday</td>
<td>1747</td>
<td>917</td>
<td>770</td>
<td>2538</td>
</tr>
</tbody>
</table>

b) Create a sheet in **EXCEL** as shown below

<table>
<thead>
<tr>
<th>Roll</th>
<th>Name</th>
<th>M1</th>
<th>M2</th>
<th>M3</th>
<th>M4</th>
<th>Total</th>
<th>Percentage</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Maximum

Minimum

Validate the columns M1, M2, M3 and M4 so that the marks lie in the range 0-100 and enter the roll number of the students using auto fill.

Calculate Total = sum of M1, M2, M3 and M4 and it should appear at the center of the cell.

Percentage = Total / 3 and format these cell values so that all the values got 2 digits after the decimal point.

Status = “pass”, if M1, M2, M3 and M4 >=50
        = “fail”, otherwise

12. Create a power point presentation about your school using animation, design template and effective presentation

**13HS201: TECHNICAL ENGLISH –II**

(Common to all UG Programmes)
Course Objectives:

- To make the students of engineering and technology enhance communicative skills
- To strengthen LSRW skills
- To boost up creative and critical thinking
- To master the skills of writing
- To face the challenges of the competitive world.

Course Outcomes:

- The students of Engineering and Technology will be able to enhance LSRW skills
- Their creative and critical thinking will be enriched
- The students will be able to face the challenges of the competitive world

UNIT I LANGUAGE FOCUS 15

Vocabulary for engineers, word formation, synonym – match the following, article, preposition, phrasal verbs, reported speech, extended definitions, numerical adjectival expressions, concord, cause and purpose expressions, same word in different parts of speech, editing

UNIT II LISTENING 7

Comprehensive listening, listening to native accent, listening to telephonic conversations, listening to short and long conversations from different domain activities, listening to various recorded conversations, speeches of great leaders, cricket commentaries, TV and radio news etc., phonetic sounds

UNIT III SPEAKING 6

Reviews of books & media, sharing of own thoughts, discussing various current issues-group discussions, task based speeches, giving instructions, role play on various themes – individual & groups, narrating stories, formal and informal speeches, reporting various incidents, aprioring strength and weakness of a friend, suggestions & solutions for various problematic situations, pronunciation skills – stress and
intonation

UNIT IV  READING

Skimming and scanning, understanding logic and sequencing in reading, inferring the exact meaning of text, making out meaning of pictorial representations, concentrated reading, reading science fictions and other literary pieces, on the spot reading

UNIT V  WRITING

Checklist, itinerary, paragraph writing, process description, Letter writing – job application with CV, business correspondence-calling for quotations, placing order, complaint letters, preparing a memo, notice and e-mail, e-mail etiquette, report writing-characteristics, structure, types, format and application, essay writing

TOTAL: 45 PERIODS

TEXT BOOKS:


REFERENCE BOOKS:


Extensive reading:

1. The Time machine – H.G. Wells
Course Objectives:

- To make the student acquire sound knowledge of techniques in solving ordinary differential equations obtained from engineering problems
- To acquaint the student with the concepts of vector calculus that is needed for problems in engineering disciplines
- To know the standard techniques of complex variable theory so as to enable the student to apply them with confidence, in application areas such as heat conduction, elasticity, fluid dynamics and flow of electric current
- To make the student for appreciating the purpose of using transforms to create a new domain in which it is easier to handle the problem that is being investigated

Course Outcomes:

At the end of this course, the students are able to

- Apply different techniques to solve ordinary differential equations
- Reduce order of differential equations
- Solve engineering problems using vector calculus
- Use complex variable theory for applications like heat conduction, fluid dynamics etc.
- Transform given problem to a new domain for solving it efficiently

UNIT 0  (Not for Examination)  5+0
Reviews of integration concepts

UNIT I  DIFFERENTIAL EQUATIONS  9+3
Method of variation of parameters – Method of undetermined coefficients – Homogenous equation of Euler’s and Legendre’s type – System of Simultaneous linear differential equations with constant coefficients - Reduction of order.
UNIT II VECTOR CALCULUS 9+3
Gradient and directional derivative – Divergence and Curl – Irrotational and Solenoidal vector fields – Line integral over a plane curve – Surface Integral and Volume Integral -Green’s, Gauss divergence and Stoke’s theorems – Verification and Application in evaluating line, surface and volume integrals

UNIT III ANALYTIC FUNCTION 9+3
Analytic functions – Necessary and sufficient conditions for analyticity - Properties –Harmonic conjugates – Construction of analytic function - Conformal Mapping – Mapping by functions w= z + c, az, 1/z, z^2, e^z - Bilinear transformation

UNIT IV COMPLEX INTEGRATION 9+3
Line Integral - Cauchy's theorem and integral formula – Taylor’s and Laurent’s Series –Singularities – Residues – Residue theorem – Application of Residue theorem for evaluation of real integrals – Use of circular contour and semicircular contour with no pole on real axis

UNIT V LAPLACE TRANSFORMS 9+3
Existence conditions – Transforms of elementary functions – Basic properties –Transforms of derivatives and integrals – Initial and Final value theorems – Inverse transforms – Convolution theorem – Transform of periodic functions – Application to solution of linear ordinary differential equations with constant coefficients

TOTAL: 65 PERIODS

TEXT BOOKS:

REFERENCE BOOKS:

13BS202: ENVIRONMENTAL SCIENCE
(Common to all UG Programmes)

Course Objectives:

- At the end of this course the student is expected to understand what constitutes the environment, what are precious resources in the environment, how to conserve these resources, what is the role of a human being in maintaining a clean environment and useful environment for the future generations and how to maintain ecological balance and preserve bio-diversity.
- The role of government and non-government organizations in environment management.

Course Outcomes:

At the end of the course the student will be able to

- Understand the basic concepts of environment studies and natural resources.
- Get the thorough knowledge about ecosystem and biodiversity.
- Have an elaborate knowledge about causes, effects and control measures of various types of pollution.
- Understand the social issues and various environmental acts.
- Know the relationship between the human population and environment.
UNIT I  INTRODUCTION TO ENVIRONMENTAL STUDIES  AND NATURAL RESOURCES

Definition, scope and importance – Need for public awareness – Forest resources: Use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forests 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

UNIT III ENVIRONMENTAL POLLUTION
Definition – Causes, effects and control measures of: (a) Air pollution (b) Water pollution (c) Soil pollution (d) Marine pollution (e) Noise pollution (f) Thermal pollution (g) Nuclear hazards – Solid waste Management: Causes, effects and control measures of urban and industrial wastes – Role of an individual in prevention of pollution – Pollution case studies – Disaster management: floods, earthquake, cyclone and landslides.

UNIT IV SOCIAL ISSUES AND THE ENVIRONMENT

UNIT V HUMAN POPULATION AND THE ENVIRONMENT

TOTAL: 45 PERIODS

TEXT BOOKS:
3. Townsend C., Harper J and Michael Begon, Essentials of Ecology,
Blackwell Science., 2000

REFERENCE BOOKS:
1. Bharucha Erach, The Biodiversity of India, Mapin Publishing Pvt. Ltd., Ahmedabad India, 2002, Email: mapin@icenet.net

13BS204: MATERIAL SCIENCE L T P C
(Common to CSE/ IT/ ECE / EEE) 3 0 0 3

Course Objectives:
- To introduce the essential principles of physics for information science and related Engineering applications.
- To transform the basic principles and concepts to understand the utility of Engineering Materials operating electrical core devices in terms of their structure and properties.
- To identify the fleet of scientific channels exploring the generation of high-tech electrical engineering materials.

Course Outcomes:
- The students are able to understand the electrical properties of the materials.
• The students will acquire knowledge about semiconducting materials.
• The students will acquire knowledge about the magnetic properties and optical properties of materials.
• The students will acquire knowledge about the applications of the magnetic materials, optical devices and nano devices.

UNIT I  ELECTRICAL PROPERTIES OF MATERIALS  9
Classical free electron theory for electrical and thermal conductivity—Wiedemann - Franz law—Draw backs of classical free electron theory—Quantum free electron theory (qualitative)—Schroedinger wave equation—time independent and time dependent wave equations—Particle in a one dimensional Box—Fermi function—Density of energy states—Carrier concentration in metals—Expression for Fermi energy.

UNIT II  SEMICONDUCTORS AND TRANSPORT PHYSICS  9
Direct and indirect bandgap semiconductors—Intrinsic Semiconductors—Carrier concentration—Determination of bandgap energy—Extrinsic semiconductor—Carrier concentration in n type and p type semiconductors—Energy band diagram of an intrinsic and extrinsic semiconductor—Variation of Fermi energy level with temperature and impurity concentration—Hall effect—Determination of Hall coefficient—carrier transport in semiconductors: Drift, Mobility and diffusion.

UNIT III  MAGNETIC PROPERTIES OF MATERIALS  9

UNIT IV  OPTICAL PROPERTIES OF MATERIALS AND  9
OPTICAL DEVICES
Classification of optical materials —Absorption in metals, insulators &
semiconductors–LED’s–Organic LED’s–Polymer light emitting materials–Plasma light emitting devices–LCD’s–Laser diodes–Optical data storage techniques(including DVD, Blue ray disc, holographic data storage)

UNIT V  NANO DEVICES

TOTAL: 45 PERIODS

TEXT BOOKS:

REFERENCE BOOKS:

13EC201: ELECTRIC CIRCUITS AND ELECTRON DEVICES
(Common to CSE /IT)

Course Objectives:
- To understand basic current and voltage laws
- To discuss transient resonance in RLC circuits
- To know in detail about semiconductor diodes
- To familiarize about transistors
• To introduce special semiconductor devices

Course Outcomes:
• Analyze DC and AC circuits using basic laws.
• Solve and verify network theorems
• Analyze the effect of temperature in semiconductor diodes
• Compare BJT with MOSFET
• Understand the working of special semiconductor devices like Diac, Triac etc.

UNIT I  CIRCUIT ANALYSIS TECHNIQUES  12

UNIT II  TRANSIENT RESONANCE IN RLC CIRCUITS  12
Basic RL, RC and RLC circuits and their responses to pulse and sinusoidal inputs – frequency response – Parallel and series resonances – Q factor.

UNIT III  SEMICONDUCTOR DIODES  12

UNIT IV  TRANSISTORS  12
Principle of operation of PNP and NPN transistors – study of CE, CB and CC configurations and comparison of their characteristics – Breakdown in transistors – operation and comparison of N-Channel and P-Channel JFET – drain current equation – MOSFET – Enhancement and depletion types – structure and operation – comparison of BJT with MOSFET – thermal effect on MOSFET.

UNIT V  SPECIAL SEMICONDUCTOR DEVICES  12
(Qualitative Treatment only)

TOTAL: 60 PERIODS

TEXT BOOKS:


REFERENCE BOOKS:


13IT201: DIGITAL PRINCIPLES AND SYSTEM DESIGN 3 0 0 3

(Common to CSE / IT)

Course Objectives:

- To understand different methods used for the simplification of Boolean functions
- To design and implement combinational circuits
- To design and implement synchronous sequential circuits
- To design and implement asynchronous sequential circuits
• To simulate combinational and sequential circuits using VHDL / Verilog HDL

Course Outcomes:
• Apply different methods to simplify Boolean function
• Design the combinational circuit.
• Design and use decoder, encoder, multiplexer and demultiplexer.
• Design synchronous sequential circuit such as shift registers and counters.
• Design asynchronous sequential circuit.

UNIT I BOOLEAN ALGEBRA AND LOGIC GATES 8

UNIT II COMBINATIONAL LOGIC 9
Combinational circuits – Analysis and design procedures - Circuits for arithmetic operations - Code conversion – Introduction to Hardware Description Language (HDL)

UNIT III DESIGN WITH MSI DEVICES 8
Decoders and encoders - Multiplexers and demultiplexers - Memory and programmable logic - HDL for combinational circuits

UNIT IV SYNCHRONOUS SEQUENTIAL LOGIC 10
Sequential circuits – Flip flops – Analysis and design procedures - State reduction and state assignment - Shift registers – Counters – HDL for Sequential Circuits.

UNIT V ASYNCHRONOUS SEQUENTIAL LOGIC 10
Analysis and design of asynchronous sequential circuits - Reduction of state and flow tables – Race-free state assignment – Hazards. ASM Chart.

TOTAL: 45 PERIODS
TEXT BOOKS:

REFERENCE BOOKS:

WEB REFERENCES:
2. www.ee.surrey.ac.uk/Projects/Labview/Sequential/Course/02-Hazards/

13BS251: APPLIED PHYSICS AND ENVIRONMENTAL CHEMISTRY LABORATORY

(Common to EEE/ ECE/CSE/MECH/IT / Bio-Tech)
(Laboratory classes on alternate weeks for Physics and Environmental Lab)

Course Objectives:
- To determine particle size and wavelength
- To determine thermal conductivity of a wire
- To find properties of a prism
- To determine DO and Chloride in water
- To determine chromium, sodium etc using various methods

Course Outcomes:
- Use Post Office Box to determine band gap of a semiconductor
Use Carey Foster Bridge to determine thermal conductivity of a wire
Use spectrometer to find dispersive power of a prism
Use Winkler's method to determine DO in water
Use Argentometric method to estimate chloride in water
Use flame photometry to estimate presence of sodium

PHYSICS LABORATORY

List of Experiments (Any FIVE Experiments)
1. Laser-Particle size and wavelength determination
2. Post Office Box-Determination of band gap of a semiconductor
3. Indexing of Powder Diffraction Pattern
4. Characteristics of a photodiode
5. Carey Foster Bridge- Determination of unknown resistance of a coil of wire and hence to find the thermal conductivity of the wire using Wiedemann-Franz law
6. Uniform pending- Young’s modulus determination
7. Spectrometer-Dispersive power of the prism

REFERENCE
1. Physics Laboratory Manual, Department of Physics, Mepco Schlenk Engineering College, Sivakasi

ENVIRONMENTAL CHEMISTRY LABORATORY

List of Experiments (Any FIVE Experiments)
1. Determination of DO in water by Winkler's method
2. Estimation of Chloride in water sample by Argentometric method
3. Determination of COD value of industrial effluents
4. Estimation of chromium in tannery wastes
5. Estimation of available chlorine in bleaching powder
7. Estimation of sodium by flame photometry
8. Determination of suspended solids and dissolved solids in water

REFERENCE


13IT251: DIGITAL CIRCUITS LABORATORY

(Common to CSE/ IT)

L T P C
0 0 3 2

Course Objectives:

- To implement adders, subtractors, code convertors, multiplexers, de-multiplexers
- To construct counters and shift registers
- To be familiar with any one digital circuits simulation software

Course Outcomes:

- Design adders, subtractors, code convertors, multiplexers, de-multiplexers
- Construct counters, shift registers using flip flops
- Construct and simulate digital circuit using VHDL software

List of Experiments

1. Verification of Boolean theorems using digital logic gates
2. Design and implementation of combinational circuits using basic gates for arbitrary functions, code converters, etc.
3. Design and implementation of 4-bit binary adder / subtractor using basic gates and MSI devices
4. Design and implementation of parity generator / checker using basic gates and MSI devices
13CS251: LINUX COMMANDS AND SHELL PROGRAMMING L T P C LABORATORY 0 1 2 2
(Common to EEE/ ECE/ CSE/ IT / Bio-Tech)

Course Objectives:
- To motivate the students to develop programs with dynamic memory allocation in C
- To motivate the students to explore the various techniques to handle files using C programs
- To provide a formal foundation to the Linux commands
- To realize some basic Linux commands using C
- To learn to use the primitive administrative commands (Eg. add, delete user)
- To train the students to write Linux shell programs with shell programming constructs
- To enable the students to work on power commands in Linux

Course Outcomes:
- Write programs with dynamic memory allocation using pointers in C
- Handle files and manipulate them using C
- Work in the Linux environment by appropriately using the
commands
- Implement some of Linux Commands using C
- Use the Linux administrative commands
- Write shell programs in Linux using the shell programming constructs
- Use the power commands for a given applications

SYLLABUS FOR THE LAB (For embedded Theory)

1. C PROGRAMMING ON LINUX
   Command Line Arguments - Pointer Programming - Dynamic Memory Allocation -Generic Programming using Pointers - File Handling

2. LINUX COMMANDS

3. SHELL PROGRAMMING
   Simple Shell program - Conditional Statements - Looping Statements – Command Line Arguments – Shell programs with C Executable

TEXT BOOKS:

REFERENCE BOOKS:

WEB REFERENCES:
1. www.w3schools.in/c-programming-language

**List of Sample Exercises**

1. Consider a department consists of two sections of students. It is required to generate a common rank list of all the students based on their CGPA. Develop a C Program for the above scenario.

2. Generate mark report for n students who passed all subjects with name, rollno, mark1, mark2, mark3, total, average. The mark details of m students who passed after revaluation can be added later.

3. A Clerk wants to generate reports of mails received based on following criteria.
   1. Sender
   2. Category (O – Official, P - Personal, C - Confidential)
   3. Size

   You are required to write a program with generic function to sort the mails based on the above said criteria.

4. Write a C program to create a file named “Data.txt”, which contains two numbers followed by an operator in each and every line. Read each line of the file, while reading it; with respect to the operator perform the operation against the numbers and store the results in another file named “Result.txt”

5. a. Create a directory “CSE”, change your working directory to ‘CSE’ and display where you are working now? Create files named “date”, “user”. Store the calendar and current date information in the file named “date” and store the login details of all users in the file “user”. Also, store the details of all active users in the same file (“user”). Finally merge the two files into a single file called “merge” and delete both the files

   b. Create a file consisting of countries and corresponding continents. Display the countries which are in the continent Africa. Sort the generated list and convert them into lowercase

6. Create a directory “Marks”, change your working directory to ‘Marks’.
a. Create 3 empty files MarkList, NameList and StudRep. Add necessary information (MarkList – Mark only, NameList – Name only, StudRep – representative Name only) to the corresponding file (minimum 15 details)

b. Merge the contents of files NameList & MarkList and store it in a file MarkDetail1 & MarkDetail2 in the following format.

MarkDetail1   Mark Detail2
Arun     100     Arun    Bala ..... 
Bala     98       100      98 ..... 
......      ...

c. Copy the first 8 lines from MarkDetail1 to the new file “Mark1”. Copy the last 4 lines from the file “Mark1” to new file “Mark2”. And finally store the contents of MarkDetail1 from the line 4 to the file “Mark3”. Display the contents of “Mark3” along with line number.

d. Display which file system is mounted on your system

7. a. Create a user group called “csestudent” and rename it as “engineers”. Add 10 users to the group and rename the usernames for atleast 5 students. Delete an user from the group and finally delete the group

b. Perform the following system administration tasks

- Print network connections, routing tables, interface statistics, masquerade connections, and multicast memberships
- System Load statistics
- Report a snapshot of the current processes.
- Report virtual memory statistics
- Display call graph profile data
- Display system tasks

8. Create a file which consists of menu of cuisines for a restaurant. Perform the following operations in the file.
- Change the price of the items which are 4$ to 6$
- Delete the list of items whose prices are less than 3$
- Replace the whitespaces between the items into ‘-‘
- Print the list of items from 4th to 10th position
- List out all the cuisines of type ‘Italian’

9. Write a shell script which will accepts login name from the user as command line argument and display the message whether the user having that login name is currently logged in or not. Also enable the user to view the long list of files that end with ‘ca’ along with the count.

10. Write a shell script to store the city names of different states in different files. The file names must be in the short form of the corresponding state names (Eg: TamilNadu-TN). Accept the state name and city name from command line. Store the city name in corresponding file. If the file doesn’t exist, create the file. If the city name already exists, display the message “City already added”.

11. Generate payroll for the company with the specifications as follows.
   If the employee’s basic salary is less than Rs.15000, then HRA=10% of basic salary and DA=90% of basic. If the employee’s salary is either equal to or above Rs.15000, then HRA=Rs.500 and DA=98% of basic salary. Automatically generate gross salary and net salary. Store the details in a file. The total number of employees should be obtained from command line

12. Implement the operations of cat, cp and wc commands in Linux using C programs

13HS301: PROFESSIONAL ETHICS AND MORAL VALUES

Course Objectives:
- To discuss about various human values and explain their
importance

- To illustrate the importance of ethics in engineering
- To highlight the importance of conducting the engineering experiments in ethical manner
- To discuss on safety standard for engineering products and services
- To explain the rights and responsibilities of professionals
- To explain the global ethical issues in business, environment, media and warfare

Course Outcomes:

- Live ethical and peaceful professional life by following human values
- Handle the ethical issues in engineering field
- Conduct the engineering experiments without affecting the society in any of the form
- Become a responsible engineer for maintaining safety in all aspects
- Become responsible in work place and ensure the rights are properly used
- Handle the global ethical issues in any form

UNIT I  HUMAN VALUES


UNIT II  ENGINEERING ETHICS

roles - Theories about right action – Self interest – Customs and Religion – Uses of ethical theories

UNIT III ENGINEERING AS SOCIAL EXPERIMENTATION 6

Engineering as experimentation – Engineers as responsible experimenters – Codes of ethics – A Balanced outlook on law – The challenger case study

UNIT IV SAFETY, RESPONSIBILITIES AND RIGHTS 6

Safety and risk – Assessment of safety and risk – Risk benefit analysis and reducing risk – The Three Mile Island and Chernobyl case studies 

UNIT V GLOBAL ISSUES 6

Multinational corporations – Environmental ethics – Computer ethics – Weapons development – Engineers as managers – Consulting engineers – Engineers as Expert Witnesses and Advisors – Moral leadership – Sample Code of Conduct

TOTAL: 30 Periods

TEXTBOOKS:


REFERENCE BOOKS:

2. Charles E. Harris, Michael S. Pritchard and Michael J. Rabins,


WEB REFERENCES:

1. www.nptel.ac.in
2. http://ethics.iit.edu/teaching/professional-ethics

13MA301 : MATHEMATICS – III

(Common to all UG Programmes) 3 1 0 4

Course Objectives:

- To know a sound knowledge on Partial Differential Equations.
- To acquaint the student with the concepts of Fourier series that is needed for problems in engineering disciplines.
- To know the standard techniques for solving boundary value problem.
- To familiarize the student with Fourier transform which is used to solve problems in engineering and technology.
- To make the student knowledgeable in the area of probabilistic models

Course Outcomes:

- Solve various Partial Differential Equations.
- Know to express any periodic functions as a series of well known periodic functions sine and cosine.
• Obtain the solution of boundary value problem such as displacement of string and heat conduction.
• Use Fourier transform in engineering applications.
• Familiar with the concepts of probability and distributions.

UNIT I PARTIAL DIFFERENTIAL EQUATIONS 9+3
Formation of PDE – Solutions of first order PDE – Lagrange’s linear PDE -Standard types and equations reducible to standard types – Singular solution — Classification of second order PDE – Solution of second and higher order linear homogeneous PDE with constant coefficients – Linear non-homogeneous partial differential equations with constant coefficients.

UNIT II FOURIER SERIES 9+3
Dirichlet’s conditions – General Fourier series – Odd and even functions – Half-range Sine and Cosine series – Parseval’s identity – Harmonic Analysis – Complex form of Fourier series.

UNIT III BOUNDARY VALUE PROBLEMS IN PDE 9+3
Method of separation of variables – Solutions of one dimensional wave equation and one dimensional heat equation – Steady state solution of two-dimensional heat equation – Fourier series solutions in Cartesian coordinates.

UNIT IV FOURIER TRANSFORM 9+3

UNIT V PROBABILITY RANDOM VARIABLES AND DISTRIBUTIONS 9+3
Axiomatic definition of probability – Conditional probability – Baye’s theorem – Discrete and Continuous random variables – Moments – Moment generating functions – Binomial, Poisson, Uniform, Exponential and Normal distributions

TOTAL: 60 PERIODS
**TEXTBOOKS:**


**REFERENCE BOOKS:**


**13CS301: DATA STRUCTURES**

Course Objectives:

- To study the design and applications of linear ADTs such as List, Stack and Queue.
- To understand the various non-linear data structures like binary tree, binary search tree, AVL, red black trees, splay and B-tree for set.
- To study the design and applications of various Heap Structures.
- To understand the graph ADT and its applications.
- To learn the various indexing techniques to avoid collision.
• To introduce concurrent List

Course Outcomes:
• Implement the linear data structures such as lists, stacks, and queues using arrays and pointers.
• Formulate the different non-linear data structures like binary trees.
• Implement the various balanced trees and compare the performance.
• Develop the various heap structures such as Binary heaps, Min heap and Leftist heap.
• Apply the BFS and DFS traversal.
• Work with searching and Hashing Techniques.
• Achieve concurrency on List

UNIT I  LINEAR DATA STRUCTURES  10

UNIT II  NON-LINEAR DATA STRUCTURES – I: FOR  9 SET

UNIT III  NON-LINEAR DATA STRUCTURES – II: FOR  10 SET
Balanced trees – AVL trees – Red-Black trees – Splay trees – B-tree – Priority queue – Binary heap – Min heap – Leftist heap – Applications of
heap.

**UNIT IV  GRAPHS**


**UNIT V  HASHING AND CONCURRENT LIST**

Linear search – Binary search – Hash tables – Separate chaining – Open addressing – Overflow handling – Cylinder surface indexing – Hash index – ISAM.

Concurrent linked lists – Coarse-grained synchronization and fine-grained synchronization.

**TOTAL: 45 PERIODS**

**TEXTBOOKS:**


**REFERENCE BOOKS:**


**WEB REFERENCES:**

1. www.nptel.ac.in

2. http://ocw.mit.edu/courses/electrical-engineering-and-computer-
Course Objectives:
- To learn the basic concepts of object-oriented programming
- To familiarize the concepts of constructor, destructor, operator overloading, Inheritances and virtual functions and templates.
- To know about Java class design, arrays strings and packages.
- To study about dynamic binding, interfaces and reflection concepts using Java
- To learn concurrent programming and event driven programming in Java.

Course Outcomes:
- Describe OOPS concepts
- Design the class with constructor, destructors, operator overloading and function overloading.
- Implement run-time polymorphism.
- Work with function and class templates.
- Create user-defined Java packages.
- Analyze the Java classes at run-time using reflection.
- Create multi-threaded programs using Java
- Handle the event driven programming.

UNIT I INTRODUCTION TO OBJECT-ORIENTED PROGRAMMING

Introduction to OOP concepts— Procedure versus Object Oriented

UNIT II OBJECT ORIENTED PROGRAMMING 9

CONCEPTS

Operator Overloading – Inheritance – Polymorphism and Virtual Functions – Function templates and Class templates – Name spaces

UNIT III JAVA FUNDAMENTALS 9


UNIT IV INHERITANCE AND POLYMORPHISM 9


UNIT V CONCURRENT AND EVENT-DRIVEN PROGRAMMING 9


TOTAL: 45 Periods

TEXTBOOKS:


REFERENCE BOOKS:


2. Timothy Budd, “An Introduction to Object-Oriented Programming”,

129


WEB REFERENCES:


13CS303: COMPUTER ORGANIZATION AND ARCHITECTURE

(Common to CSE / IT)

Course Objectives:

• To have a thorough understanding of the basic structure and operation of a digital computer.

• To discuss in detail the operation of the arithmetic unit including the algorithms & implementation of fixed-point and floating-point addition, multiplication & division.

• To study about the pipelining architecture

• To study the hierarchical memory system including cache memories and virtual memory.

• To study the different ways of communicating with I/O devices and standard I/O interfaces.

Course Outcomes:

• Work with the instruction set of given architecture
• Design and analyze the main functional units of a computer.
• Design a pipeline for consistent execution of instructions with minimum hazards
• Analyze memory hierarchy and its impact on computer cost/performance.
• Write assembly programs that accomplish basic computational and I/O operations

UNIT I  BASIC STRUCTURE OF COMPUTERS  9

UNIT II  BASIC PROCESSING UNIT  9

UNIT III  PIPELINING  9
Basic concepts – Pipeline Organization and issues – Data dependencies – Memory and branch delays – Performance evaluation – Pipelining in CISC processors.

UNIT IV  MEMORY SYSTEM  9

UNIT V  I/O ORGANIZATION  9

L : 45; T:15; TOTAL: 60 Periods
TEXTBOOK:

REFERENCE BOOKS:

WEB REFERENCES:
2. http://www.dauniv.ac.in/downloads/CArch_PPTs/
3. www.nptel.ac.in

13IT304: PRINCIPLES OF COMMUNICATION L T P C
(Common to CSE / IT) 3 0 0 3

Course Objectives:
- To understand the basic analog transmission and communication techniques
- To learn digital modulation techniques
- To study about the digital communication methods
- To learn the concept of spread spectrum and Multiple access techniques.
- To understand the basic concepts of satellite and optical communication.
Course Outcomes:

- Characterize and determine the behavior of analog modulation schemes in time and frequency domains
- Select the appropriate digital modulation techniques
- Determine the performance of different digital communication systems
- Characterize the operation of spread spectrum and multiple access schemes
- Get exposed to the working of Satellite and Optical Communication Systems

UNIT I  ANALOG COMMUNICATION

Need of modulation - Principles of amplitude modulation - AM envelope - Frequency spectrum and bandwidth - Modulation index - AM power distribution - AM Transmitter Angle modulation - FM and PM waveforms - Phase deviation and modulation index - Frequency deviation - FM Transmitter - Frequency analysis of angle modulated waves - Bandwidth requirements for angle modulated waves - Super heterodyne receiver.

UNIT II  PULSE MODULATION

Sampling theorem - Pulse amplitude modulation - Pulse width modulation - Pulse position modulation and pulse code modulation - Uniform quantization - Delta modulation - Intersymbol interference - Eye patterns.

UNIT III  DIGITAL COMMUNICATION

Signal representation - Signal constellation diagram - Coherent detection - Transmitter and receiver of phase shift keying - Frequency shift keying - Quadrature phase shift keying and quadrature amplitude modulation

UNIT IV  SPREAD SPECTRUM AND MULTIPLE ACCESS TECHNIQUES

Introduction - Pseudo-noise sequence - DS spread spectrum with coherent binary PSK - Processing gain - FH spread spectrum - Multiple
access techniques – FDMA - TDMA and CDMA.

UNIT V  SATELLITE AND OPTICAL COMMUNICATION

Satellite communication systems - Kepler’s law - LEO and GEO orbits - Footprint - Link model - Optical communication systems - Elements of optical fiber transmission link - Types - Losses - Sources and detectors.

TOTAL: 45 Periods

TEXTBOOKS:

REFERENCE BOOKS:

WEB REFERENCES:
1. www.nptel.ac.in

13HS351 : PRESENTATION SKILLS
LABORATORY

Course Objectives:
• To hone the students' proficiency in speaking skills
• To enhance their pronouncing skills
• To help the students acquire presentation skills
• To enable the students communicate effectively

Course Outcomes:
• The students of Engineering and Technology will be able to recognize phonemes
• The students’ pronunciation will be improved
• All strategies of presentation skills will be acquired
• Interpersonal skills will be developed

Phonetic Practice 3
English phonemes: Vowels, Diphthongs, Consonants - Word Stress, phoneme recognizing practice

Listening Comprehension 3
Documentaries, Educational video clips, Oration of Great leaders, Radio & TV news, Listening to conversations, Telephone etiquette

Language Functions 4
Giving reasons, talking about future plans, Reporting, Comparing & Contrasting, persuasion and dissuasion, Negotiation, Making suggestions

Presentation Skills 15
Kinesics, slides preparation, Presentation techniques, Language Etiquette and Power dressing.

Sample topics for Presentation:
1. Space travel
2. Cloud computing
3. Biometric system
4. Touch screen technology
5. Green computing
6. Global positioning system
7. Wi-fi technology
8. Android
9. Cloning
10. Brake system
11. Bluetooth technology
12. Technology for security
13. Automated transport
14. Bio products
15. Natural calamities
16. Waste management
17. Applications of fibre optics
18. Nano mania
19. Technology in Education
20. Blogging
21. Technology in agriculture

TOTAL: 25 PERIODS

REFERENCE BOOKS:

13CS351: DATA STRUCTURES LABORATORY

(Common to CSE / IT) 0 0 3 2

Course Objectives:
• To develop programming skills in design and implementation of linear data structures
• To build non linear data structures such as set using arrays, various tree structures
• To work with different hash searching and binary search techniques
• To build and work with different types of heaps
• To work with graph and solve some of the applications using graph

Course Outcomes:
• Develop the various linear data structures as such as List, Stack and Queue ADTs
• Enlarge programming skills in design and implementation of non linear data structures
• Solve the collision problem using hashing technique
• Build the various heaps structures
• Solve graph based applications

SYLLABUS FOR THE LAB :
1. Lists and applications of List
2. Stacks and its applications
3. Queues
4. Binary Search tree
5. Set
6. AVL tree
7. Binary Heap
8. Graph traversal and spanning tree
9. Hashing
10. Concurrent List

TOTAL: 45 PERIODS

REFERENCE BOOKS :


WEB REFERENCES:

1. www.nptel.ac.in

List of Sample Exercises

1. Implement the following List operations using Linked List storage structure:
   - Insert at front
   - Insert at middle
   - Insert end
   - Delete first
   - Delete last
   - Delete an element
   - Traversal
   - Find by position
   - Find by an element
   - Make empty.

2. Implementation of stacks using array and linked list and Evaluation of expressions.

3. Construct Bi-stack in a single array and perform the following operations for string manipulation such as:
• Search for a character and replace it by a new one if available
• Reverse a String
• Test for palindrome
• Count the occurrences of the given character

4. Implement queues using array and linked list and perform CPU scheduling

5. Perform polynomial operations by representing the polynomials using linked list

6. Using search tree construct a Telephone directory with the information such as Phone Number, Name and address and perform the following:
   • Search for a phone number and print the customer name and address
   • Remove a phone number from the directory
   • Change the address of the customer whose phone number is given.
   • Print the content of the directory

7. Implement AVL tree with insert, search, delete and traversal operations.

8. Construct binary min / max heap and perform the following:
   • Find 3rd minimum / maximum
   • Delete an item(with random priority)
   • Delete minimum / maximum element
   • Sort Heap
   • Modify the priority of an item

9. Graph Traversals – Depth First and Breadth First search
   • Given an X Y board containing obstacles and a knight that can only move like the chess piece, Find the minimum number of moves necessary to reach a certain destination on
that board
- Bessie is caught at the lower left corner of an X Y grid forest with various obstacles in her way. Given that she wants to reach the upper right corner, and that she never go back to a point she has already visited, how many paths can she take?

10. For the given route map with cost of transportation between different cities, find the shortest route from a source to all the other cities.

11. Find the minimum spanning tree of the given graph using Prim’s Algorithm

12. Locate a particular word in a dictionary.

13. Implement a dictionary which contains the meaning of different words. Both the word and the meaning can be in the same language. Your program should read a word and should give the meaning. If the word is a new one (not available in the dictionary) then include the word into its correct position with its meaning. Use Hashing techniques.

14. Maintain a list of CD titles with information such as category and title. Duplicates entries are allowed. Example Categories are: Education, Entertainment, Examinations, Soft skill, Games etc. Design a concurrent system using to get new entries to add, search for an entry, delete the existing entries and view the titles. The system does not know the number of titles in advance. The system may keep the information in order of the title.

13CS352: OBJECT ORIENTED PROGRAMMING
LABORATORY

Course Objectives:
- To practice with coding standards
• To apply the basic concepts of object-oriented programming
• To experiment with constructor, destructor, operator and function overloading
• To work with inheritances and virtual functions
• To expertise in different methods of event handling and template concepts in Java
• To implement concurrent programming using Java

Course Outcomes:
• Master OOP concepts in C++
• Design and implement C++ class with constructors and destructor.
• Design and implement C++ class with operator overloading and function overloading.
• Work with function and class template in C++.
• Implement run-time polymorphism using Java.
• Handle Java swing components events
• Use Java concurrent programming techniques.

SYLLABUS FOR THE LAB:

C++

1. Practicing with coding standards (use DOXYGEN), Version control tools (GIT)
2. Functions with default arguments
3. Classes, objects, member functions, Constructors, destructor, static data members and static member function
4. Function overloading and Operator Overloading including unary and binary operators.
5. Inheritance, virtual function and virtual base classes.
6. Function templates and class templates.

JAVA
1. Simple java programs for understanding reference to an instance of a class (object), methods, Handling Strings and Arrays in Java
2. User defined package creation and Java Documentation
3. Inheritance, polymorphism and interface
4. Multithreading
5. Event driven programming
6. Mini Project

TOTAL: 45 PERIODS

REFERENCE BOOKS:

WEB REFERENCES:

List of Sample Exercises
1. Practicing with coding standards (use DOXYGEN), Version control tools (GIT)
2. Write a C++ program to find the area of the rectangle.
   [Hint: Function prototype with default arguments - int area(int l=10,int b=20)]
3. Implement Vector class in C++ with necessary data member and necessary methods. Give proper constructors, destructor, copy
constructor.

4. Write a C++ program to define a class Date that holds day, month and year as data members. Also write necessary member methods to
   a) Read a date
   b) Print a date in different formats
   c) Find the date exactly one week after the given date.
      e.g. If the given date is 30-10-2013, then the resultant date is 6-11-2013

5. Design Complex Number class and implement its operations with operator overloading

6. Write a C++ program to define Matrix class. Using this class overload operators >> (to read a matrix), operator << (to print a matrix), operator + (to add 2 matrices).

7. Design a C++ class Numbers and implement the sorting algorithms such as bubble sort and insertion sort.

8. Write a C++ Program to define a List template class with member methods to insert, delete and display list. Test this List by creating a list of integers, characters and floating point numbers.

9. Develop Rational number class in Java with numerator and denominator as private data members. Write necessary constructors and methods. Use JavaDoc comments for documentation. Your implementation should use efficient representation for a rational number, i.e. (500 / 1000) should be represented as (½). Also, write method that adds and subtract two rational numbers.
   Eg.: 160 / 290 , 230 / 290

10. Write a Java program to demonstrate the user defined package creation. Create a package “vehicle” and store the classes TwoWheeler and FourWheeler. Develop an application to access these two classes.
11. Design a Vehicle class hierarchy in Java. Write a test program to demonstrate polymorphism. You should call the super class constructor from your derived class.
   Eg: Derived class {TwoWheeler, FourWheeler} or {GearedVehicle, NonGearedVehicle}

12. Design a Java interface for Stack ADT. Develop two different classes that implement this interface, one using array and the other using linked-list. Provide necessary user defined exception handling in both the implementations.

13. Design a Java interface for Queue ADT. Develop two different classes that implement this interface, one using array and the other using linked-list. Provide necessary user defined exception handling in both the implementations.

14. Write a Java applet program to create a simple scientific calculator.

15. Write a Java swing program to draw pictures with mouse by dragging the mouse on the background.

16. Write a Java swing program to design the GUI for Registration Page with all needy components.

13MA403: DISCRETE MATHEMATICS
(Common to CSE / IT)

Course Objectives:
- To introduce students to ideas and techniques from discrete mathematics that are widely used in science and engineering
- To make the students to think logically and mathematically and apply these techniques in solving problems
- To provide the foundation for imbedding logical reasoning in computer science.
- Develop recursive algorithms based on mathematical induction
- Know basic properties of relations
Course Outcomes:
Upon completion of this course the students should be able to do the following:

- Construct mathematical arguments using logical connectives and quantifiers.
- Verify the correctness of an argument using propositional and predicate logic and truth tables
- Demonstrate the ability to solve problems using counting techniques and combinatorics
- Construct proofs using direct proof, proof by contraposition, proof by contradiction, proof by cases
- Perform operations on discrete structures such as sets, functions, relations, and sequences

UNIT I  SET THEORY  9+3
Set operations – Properties - Power set - Methods of proofs – Relations - Graph and matrix of a relation - Partial order - Well ordering - Equivalence relation - Classes and properties – Functions -One to one – Onto – Bijective - Composition of relation and functions - Inverse functions

UNIT II  LOGIC AND PROOFS  9+3

UNIT III  INDUCTION AND COMBINATORICS  9+3
UNIT IV ALGEBRAIC STRUCTURE
Algebraic systems – Semi groups and monoids – Groups – Subgroups and homomorphisms – Cosets and Lagrange’s theorem – Rings & fields (Definitions and examples).

UNIT V LATTICES AND BOOLEAN ALGEBRA

TOTAL: 60 Periods

TEXTBOOKS:

REFERENCE BOOKS:

WEB REFERENCES:

13CS401: MICROPROCESSORS AND MICROCONTROLLERS
(Common to CSE / 3rd semester IT)
Course Objectives:

- To understand the architecture of Intel 8086 and learn programming with different addressing modes
- To learn the incorporation of coprocessor with 8086
- To understand the functionalities and working of supporting devices like parallel and serial communication interface, timer, interrupt controller, DMA controller etc.
- To know the architecture and programming of 8 bit microcontroller 8051
- To learn the evolution of processors and its features

Course Outcomes:

- Differentiate Central Processing Unit as microprocessors and microcontrollers
- Use 16 bit processor Intel 8086 and apply it for solving problems with enhanced features
- Interface the microprocessors with various input output devices
- Work with Intel 8051 microcontroller and use it for peripheral interfacing.
- Get Exposed to the features of recent processors

UNIT I 8086 ARCHITECTURE AND PROGRAMMING 9


UNIT II 8086 AND SUPPORTING PROCESSORS 8

Minimum and Maximum mode configurations – Clock Generator – Bus controller - System bus timing – Coprocessor: Data types – Instruction set.

UNIT III INTERFACING 10

Memory interfacing and I/O interfacing - Parallel communication

UNIT IV THE 8051 MICROCONTROLLER 9
Architecture of 8051 – Signals – Operational features – Instruction set - Memory and I/O addressing – Timer – Interrupts – Serial Port – Introduction to 16 bit microcontroller

UNIT V EVOLUTION OF PROCESSORS 9
Introduction to 80286 – 80386 – 80486 – Pentium – Multi Core Processors

TOTAL: 45 Periods

TEXTBOOKS:

REFERENCE BOOKS:


WEB REFERENCES:
1. www.intel.com
2. www.nptel.ac.in

13CS402: DESIGN AND ANALYSIS OF ALGORITHMS L T P C
(Common to CSE / IT)
3 0 0 3

Course Objectives:
• To introduce the mathematical aspects of analysing an algorithm
• To learn and analyze the problem solving techniques such as Divide and conquer, Greedy method, Backtracking, Dynamic programming, Branch and Bound.
• To study various data sorting and searching methods.
• To study and solve the NP problems like Knapsack and Traveling salesman
• To introduce advanced algorithms such as Approximation Algorithms, Randomization Algorithms and Parallel Algorithms

Course Outcomes:
• Analyze the implications of iterative and recursive algorithms.
• Design and implement problem solving techniques such as Divide and conquer, greedy method, dynamic programming, Backtracking, Branch and Bound.
• Perform sorting and searching on the given collection of records
using key field

- Analyze the efficiency of NP-complete problems
- Work with advanced algorithms such as Approximation Algorithms, Randomization Algorithms and Parallel Algorithms

UNIT I  ANALYSIS & DIVIDE AND CONQUER  9

UNIT II  GREEDY & DYNAMIC PROGRAMMING  9

UNIT III  BACKTRACKING & BRANCH-AND-BOUND  9

UNIT IV  SORTING & STRING MATCHING  9

UNIT V  NP PROBLEMS & ADVANCED ALGORITHMS  9
algorithms and parallel algorithms - Parallel sorting.

TOTAL: 45 PERIODS

TEXTBOOKS:

REFERENCE BOOKS:

WEB REFERENCES:
1. www.nptel.ac.in

13CS403 : SYSTEM SOFTWARE L T P C
(Common to CSE / 5th semester IT) 3 0 0 3

Course Objectives:
• To understand the relationship between system software and machine architecture
• To learn to design and implement assemblers
• To study loaders and virtual machines
• To learn to design and implement macroprocessors
• To have an understanding of system software tools like debugger and text editor

Course Outcomes:
• Formulate the relationship between system software and machine architecture
• Design a simple assembler and loader
• Work with CLR environment
• Design and implement macro processors
• Work with system software tools like editor and debugger

UNIT I INTRODUCTION

UNIT II ASSEMBLERS
Basic assembler functions – Algorithm and data structures – Machine dependent assembler features – Machine independent assembler features – Assembler design options – One Pass assembler - Multi pass assembler – MASM assembler

UNIT III LOADERS AND VIRTUAL MACHINE

UNIT IV MACRO PROCESSORS
Basic macro processor functions – Algorithms and data structures – Machine independent macro processor features – Design options – MASM macro processor

UNIT V TEXT EDITORS AND DEBUGGERS
Text editor – Editing process – User interface – Editor structure – Interactive debugging system – vim editor – Latex editor

**TOTAL: 45 Periods**

**TEXTBOOKS:**


**REFERENCE BOOKS:**


**WEB REFERENCES:**


**13CS404: PRINCIPLES OF PROGRAMMING LANGUAGES**  
**L T P C**  
**3 0 0 3**

**Course Objectives:**

- To understand and describe syntax and semantics of programming languages
- To understand data, data types, and basic statements
- To describe call-return architecture and ways of implementing them
- To understand object-orientation, concurrency, and event handling in programming Languages
- To know about the logic and scripting languages
Course Outcomes:

- Able to describe syntax and semantics of programming languages
- Work with data, data types, and basic statements of programming languages
- Design and implement subprogram constructs
- Apply object-oriented, concurrency, and event handling programming constructs
- Develop programs in functional languages like Scheme, ML, and Prolog

UNIT I  INTRODUCTION


UNIT II  SEMANTICS

Expression – Assignment - Control flow – Input/output – Exception handling – State transformations and partial functions – Semantics with dynamic typing – Formal treatment of semantics

UNIT III  FUNCTIONS AND IMPLEMENTATIONS

Call and return – Parameters and parameter passing mechanisms – Function implementation: function declaration – semantics of call and return – formal treatment of types and semantics – Memory management: dynamic arrays – garbage collection

UNIT IV  PROGRAMMING TECHNIQUES – I


UNIT V  PROGRAMMING TECHNIQUES – II

communication – Scripting languages.

**TOTAL: 45 Periods**

**TEXTBOOKS:**


**REFERENCE BOOK:**


**WEB REFERENCES:**

1. [http://home.deib.polimi.it/pradella/PL.html](http://home.deib.polimi.it/pradella/PL.html)


**13IT401: DATABASE MANAGEMENT SYSTEMS**

<table>
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(Common to CSE / IT)

**Course Objectives:**

- To correlate the role of database management systems in information technology applications within organization.

- To sketch basic database concepts, including the structure and operation of the relational data model.

- To articulate the use of contemporary logical design methods and study various normalization methods.

- To understand the relationship between Transaction Processing and Databases
• To study query processing and optimization

Course Outcomes:

• Explore the basic concepts of Database system and design database for enterprise applications using Entity Relationship Diagrams
• Analyze the consequence of calculus in designing relational model and create database using query languages with constraints and security
• Normalize databases to reduce cost due to redundancy constraints
• Assess different types of scheduling and recovery techniques for concurrent transactions
• Validate the query evaluation plan and optimize to reduce computational complexity

UNIT I  DATABASE FUNDAMENTALS  9

UNIT II  RELATIONAL DATABASE MODEL  9

UNIT III  LOGICAL DATABASE DESIGN  9
Need for good database design – Functional Dependencies and Keys – Closure of Functional Dependencies Set – Closure of attributes - Dependency Preservation - Decomposition using functional

UNIT IV DATABASE TRANSACTIONS AND CONCURRENCY CONTROL


UNIT V QUERY PROCESSING AND OPTIMIZATION


TOTAL: 45 PERIODS

TEXTBOOK:


REFERENCE BOOKS:


WEB REFERENCES:

13CS451: MICROPROCESSORS AND MICROCONTROLLERS LABORATORY
L T P C 0 0 3 2
(Common to CSE / 3rd semester IT)

Course Objectives:
- To acquire expertise in assembly language programming using 8086 programs
- To develop programming skills on microcontroller programming using 8051
- To apply the assembly language programming for various peripheral interfacing with the help of supporting chips.

Course Outcomes:
- To write assembly language programs using 8086
- To design effective applications using MASM assembler and cross assemblers
- To write programs to perform I/O using handshaking and interrupts
- To develop different interfacing applications using the supporting chips
• To design simple applications

SYLLABUS FOR THE LAB:

1. Simple programming exercises on 8086.
2. Code conversion, decimal arithmetic and Matrix operations.
3. Simple programming with BIOS Interrupts
4. Simple programming with DOS Interrupts
5. String manipulation - search, find and replace, copy operations, sorting and searching.
7. Interfacing with 8086 – 8279 and 8251.
8. Interfacing stepper motor with 8086/8051.
9. Interfacing ADC and DAC with 8086/8051.
10. Interfacing traffic light controller with 8086/8051.

TOTAL: 45 PERIODS

13CS452: SYSTEM SOFTWARE
LABORATORY

Course Objectives:

• To learn to design and implement symbol table
• To learn to design and implement one pass and two pass assembler
• To learn to design and implement absolute and relocatable loader
• To experiment with CLR
• To learn to design and implement macro processor and text editor

Course Outcomes:

• Implement symbol table with appropriate data structure
• Implement simple Assembler
• Implement simple Loader
• Work with CLR environment
• Implement simple macro processor and text editor

**Syllabus for the lab:**

1. Study of vim and Latex editors
2. Implement symbol table for a 8086 assembler
3. Implementation of assembler – Two pass assembler for 8086 processor, one pass assembler for 8086 architecture
4. Implementation of Loader – for 8086 architecture
5. Working with Common Language Runtime environment
6. Implementation of One pass Macro processor – for 8086 architecture
7. Implementation of simple text editor

**TOTAL: 45 PERIODS**

**WEB REFERENCES:**


**List of Sample Exercises (Using C language)**

1. Develop documents using Latex.
2. Implementation of symbol table using hash table
3. Design and implement Pass I of a two pass assembler for 8086 processor assuming the input is error free.
4. Design and implement Pass II of a two pass assembler for 8086 processor assuming the input is error free.
5. Design and implement one pass assembler for 8086 architecture
6. Design and implement Absolute loader for 8086 architecture
7. Design and implement a pre-processor for processing macros in C language using CLR environment
8. Design and implement Rolling display system for advertisement in
CLR environment
9. Design and implement One pass Macro processor for 8086 architecture
10. Design the editor structure for a text editor and implement it

13IT451: DATABASE MANAGEMENT SYSTEMS L T P C
LABORATORY
(Common to CSE / IT) 0 0 3 2

Course Objectives:
• To persuade different issues involved in the design and implementation of a database system for real time applications.
• To speculate sophisticated queries to extract information from the large datasets available.
• To schematize several database projects related to an information technology problem based on given requirements.

Course Outcomes:
• Populate and query a database using SQL DML/DDL commands.
• Declare and enforce integrity constraints on a database using a state-of-the-art RDBMS
• Program in PL/SQL including stored procedures, stored functions, cursors, packages.
• Design and build a GUI application using any programming language as front end

LIST OF EXPERIMENTS
Database Design using ER Diagram and Apply Normalization
1. Data Definition Language Commands
2. Data Manipulation Language Commands
3. Data Control Language, Nested Queries
4. Set operators and Join Queries
5. Views and Indexes
6. PL/SQL – Triggers
7. PL/SQL – Functions
8. PL/SQL – Procedures
9. OORDBMS
10. Integrity and Authorization
11. Front end Tools
12. Form / Menu Design / Report
13. OLTP concepts

13MA501: PROBABILITY AND QUEUEING THEORY  L T P C
3 1 0 4

Course Objectives:
- To know the association between the variables using correlation and regression.
- Understand the basic theory of discrete-time Markov chains.
- To introduce the basic concept of queueing theory.
- To formulate concrete problems using queueing theoretical approaches and to apply queueing theory results to queueing Networks.
- To familiarize the student with the knowledge of reliability of systems and statistical quality control of the products.

Course Outcomes:
- Acquire skills in handling situations involving more than one random variable and functions of random variables.
- Have a well-founded knowledge of Markov processes which can describe real life phenomena.
- Be exposed to basic characteristic features of a queueing system and acquire skills in analyzing models.
• Gain some insights on reliability and quality control

UNIT I  TWO DIMENSIONAL RANDOM VARIABLES  9 + 3
Joint distributions - Marginal and conditional distributions – Correlation and regression - Transformation of random variables – Central limit theorem.

UNIT II  MARKOV PROCESSES AND MARKOV CHAINS  9 + 3

UNIT III  QUEUEING THEORY  9 +3
Markovian models – Birth and death queuing models- Steady state results: Single and multiple server queuing models- queues with finite waiting rooms- Little’s Formula.

UNIT IV  NON-MARKOVIAN QUEUES AND QUEUEING NETWORKS  9 + 3
M/G/1 queue- Pollaczek- Khinchine formula- series queues- open and closed networks.

UNIT V  RELIABILITY AND QUALITY CONTROL  9 + 3
Concepts of reliability - Hazard functions - Reliability of series and parallel systems - Control charts for measurements (Mean and Range charts) – Control charts for attributes (p, c and np charts).

TOTAL: 60 Periods

Note:  Approved statistical table is permitted to use in the examinations.

TEXTBOOKS:

REFERENCE BOOKS:


WEB REFERENCES:
2. http://people.brunel.ac.uk/~mastjjb/jeb/or/queue.html

Course Objectives:
- To know the different types of finite automata and regular languages
- To familiarize context free grammars and push down automata
- To learn about Turing machines
- To study about undecidable problems
- To expose current trends and applications

Course Outcomes:
- Design finite state automata for a language specification and convert one form of automaton to another form
- Construct regular expression for a particular language
- Prove non regular languages using pumping lemma for regular languages
- Design push down automata(PDA) for languages and convert CFG
to PDA and vice versa

- Design Turing machine and find undecidability in languages
- Work with various grammars like matrix grammars, random context grammar etc and their applications

**UNIT I  REGULAR LANGUAGES**

FINITE AUTOMATA (FA) – DETERMINISTIC FINITE AUTOMATA (DFA) – NON-DETERMINISTIC FINITE AUTOMATA (NFA) – Finite automata with epsilon transitions - Regular expression – FA and regular expressions.

**UNIT II  CONTEXT FREE LANGUAGES**

CONTEXT FREE GRAMMAR (CFG) – Parse trees – Ambiguity in grammars and languages – Equivalence of Parse trees and derivation - Normal forms for CFG – Introduction to pushdown automata – Languages of a Pushdown Automata – Equivalence of pushdown automata and CFG.

**UNIT III  CLOSURE PROPERTIES**


**UNIT IV  TURING MACHINES**

Turing machines: language of a Turing machine – Turing machine as a computing device - Techniques for construction of TMs – Equivalence of one tape and multi tape TM’s.

**UNIT V  UNDECIDABILITY**

Undecidability: A language that is not Recursively Enumerable (RE) – An undecidable problem that is RE – Undecidable problems about Turing machine – Rice theorem for recursive and recursively enumerable languages – Post’s correspondence problem – Classes P and NP – Polynomial reductions and NP complete problems

**L : 45 ; T : 15 ; TOTAL: 60 Periods**
TEXTBOOKS:

REFERENCE BOOKS:

WEB REFERENCES:
1. www.nptel.ac.in

13CS502: OPERATING SYSTEMS L T P C
(Common to CSE / 4th semester IT) 3 0 0 3

Course Objectives:
- To provide basic knowledge of computer operating system structures and functioning
- To study about process management
- To learn the basics of memory management
• To understand the structure of file and I/O systems
• To be familiar with some operating systems

Course Outcomes:
• Identify the components and their functionalities in the operating system
• Analyze the various process management algorithms
• Evaluate the performance of various memory management techniques
• Design a simple file system
• Analyze the performance of I/O operations
• Get exposed to some popular operating systems - Linux, Windows

UNIT I OPERATING SYSTEMS OVERVIEW

UNIT II PROCESS MANAGEMENT

UNIT III MEMORY MANAGEMENT
Allocation of frames – Thrashing

UNIT IV FILE AND I/O SYSTEMS


I/O Systems – I/O Hardware – Application I/O Interface – Kernel I/O subsystem

UNIT V CASE STUDY


Windows 8 – History – Design principles. Android OS - History – Design principles

TOTAL: 45 PERIODS

TEXTBOOKS:


REFERENCE BOOKS:


WEB REFERENCES:

1. www.nptel.ac.in

13CS503: CLIENT-SIDE TECHNOLOGIES L T P C

Course Objectives:

- To identify the various tags used in HTML document.
- To create user interactive web pages using JavaScript and DOM
- To control the presentation of documents using Cascading Style Sheets (CSS).
- To work with different technologies related to XML
- To update contents of a document without reloading using AJAX with JSON.
- To create animation over web using SVG

Course Outcomes:

- Identify the key components of HTML document
- Design a website using CSS and HTML
- Create interactive web pages using JavaScript
- Access and process various elements of web page using DOM
- Represent web data using XML and perform translation using XSLT
- Design Web Pages using AJAX
- Create animated web pages using SVG

UNIT I BASIC INTERNET PROTOCOLS, HTML5

UNIT II  JAVASCRIPT, JQUERY  9

UNIT III  CSS, DOM  9
Types of CSS- Conflicting style sheets - Element positioning and dimension - Box model and text flow - Media types - Queries - Drop down menus - Text shadows - Rounded corners - Color box Shadows - Gradients - Animation - Flexible box layout module - Multicolumn layout introduction to DOM: Modeling a document - Traversing and modifying a DOM tree - DOM collections - Dynamic styles - Using timer and dynamic styles to create animated effects

UNIT IV  XML  9

UNIT V  AJAX, JSON, SVG  9
Ajax - Enabled rich internet applications with XML and JSON - SVG and bitmaps - SVG graphics model - SVG and CSS - SVG tools - SVG basic built in shapes – SVG transforms and groups - SVG definitions and metadata - Viewports and coordinates - SVG colors and gradients - Including bitmap images in SVG - SVG text and fonts - SVG animation four ways - SVG and HTML5 - SVG and web apps - Making SVG with XQuery or XSLT

TOTAL: 45 Periods

TEXTBOOKS:

REFERENCE BOOK:

WEB REFERENCES:
1. www.nptel.ac.in
Course Objectives:
- To understand the basic fundamental concepts of computer networking
- To enumerate the layered architecture of OSI and TCP/IP model with its functions
- To study, analyze and implement the design of a network using TCP and UDP
- To be familiar with the protocols of various layers and how they can assist in network design and implementation

Course Outcomes:
- Develop an understanding of basic computer network technology with various topologies, transmission media along with error and flow control techniques in physical & data link layer.
- Expertise knowledge in routing and switching using basic protocols for various issues in a given networking area.
- Explore the features of TCP and UDP and analyze the networking functionality for the development of an application using socket functions.
- Bring out the issues and protocols involved in application layer of OSI architecture.
- Analyze the various issues of IPv6.

UNIT I  INTRODUCTION – PHYSICAL & 10 DATALINK LAYER

UNIT II NETWORK LAYER


UNIT III TRANSPORT LAYER & ELEMENTARY SOCKETS


UNIT IV APPLICATION LAYER

Domain Name System (DNS) – gethostbyname function - gethostbyaddr function - E-mail (SMTP, IMAP, POP3) - FTP - SNMP – RMON

UNIT V ISSUES IN IPv6


TOTAL: 45 Periods

TEXTBOOKS:


REFERENCE BOOKS:

1. James F. Kuross, Keith W. Ross, “Computer Networking, A


WEB REFERENCES:

1. www.nptel.ac.in


13IT504: SOFTWARE ENGINEERING L T P C

( Common to CSE / IT ) 3 0 0 3

Course Objectives:

• To explore the fundamental concepts of software engineering
• To develop skills that will enable them to construct software of high quality.
• To realize the process of developing new technology and the role of experimentation
• To introduce ethical and professional issues in developing project.
• To know the concepts of different testing techniques.
Course Outcomes:

- Apply software engineering principles and techniques
- Develop, maintain and evaluate large-scale software systems
- Perform independent research and analysis
- Work as an effective member or leader of software engineering teams
- Ability to apply the principles, tools and practices of IT project management

UNIT I  SOFTWARE PROCESS AND DEVELOPMENT METHODOLOGY  9


UNIT II  SOFTWARE REQUIREMENTS  9


UNIT III  ANALYSIS, DESIGN CONCEPTS AND PRINCIPLES  9

Systems engineering - Analysis concepts - Design process and concepts – Modular design – Design heuristic – Architectural design – Data design – User interface design – Real time software design – System design – Real time executives – Data acquisition system – Monitoring and control system

UNIT IV  TESTING  9

Taxonomy of software testing – Types of S/W test – Black box testing – Testing boundary conditions – Structural testing – Test coverage criteria based on data flow mechanisms – Regression testing – Unit testing – Integration testing – Validation testing – System testing and Debugging –
Software implementation techniques

UNIT V SOFTWARE PROJECT MANAGEMENT


TOTAL: 45 Periods

TEXTBOOKS:


REFERENCE BOOKS:


WEB REFERENCES:

1. www.nptel.ac.in

Course Objectives:

- To experiment file related system calls.
- To practice on the process related system calls.
- To synchronize processes using semaphores.
- To experiment with IPC system calls.

Course Outcomes:

- Work with file related System calls.
- Manage processes using fork, exec, etc.
- Establish communication between processes.
- Apply Synchronization techniques.

Syllabus for the lab:

1. Working with file system commands
2. Process creation and management
3. Development of routines for inter process communication
4. Simulation of CPU scheduling algorithms and performance analysis
5. Simulation of Producer-Consumer problem using semaphores.
6. Implementation of deadlock avoidance and prevention algorithms
7. Implementation of contiguous and non contiguous memory allocation algorithms
8. Implementation of Page replacement algorithms
9. Analysis of file allocation algorithms
10. Simulation of disk scheduling algorithms
11. Mini Project

TOTAL: 45 PERIODS

REFERENCE BOOKS:


WEB REFERENCES:

List of Sample Exercises
1. Write a program to simulate the file system commands such as cat, mv, rm, cp, ls and grep.
2. Write a program to implement Inter Process Communication (IPC) using pipes.
3. Write a program to implement Inter Process Communication (IPC) using shared memory and message queue.
4. Write a program to simulate and analyze the following scheduling algorithms.
   i. FCFS
   ii. SJF (preemptive and non-preemptive)
   iii. Priority Scheduling (preemptive and non-preemptive)
   iv. Round Robin Scheduling
5. Write a program to solve the Producer-Consumer problem using
semaphores.

6. Write a program to implement deadlock avoidance algorithms.

7. Write a program to implement contiguous and non contiguous memory allocation algorithms.

8. Write a program to implement page replacement algorithms (FIFO, LRU, and Optimal).

9. Write a program to implement file allocation techniques (Contiguous, Linked, Indexed, and Shared).

10. Write a program to implement the various disk scheduling algorithms (FCFS, SSTF, SCAN, C-SCAN, LOOK, and C-LOOK).

11. Mini project

13IT552: NETWORK LABORATORY
(Common to CSE / IT)

Course Objectives:

- To implement the working of networking concepts.
- To design and develop robust networking applications using TCP and UDP
- To design the working of various protocols
- To demonstrate the usage of various networking tools.

Course Outcomes:

- Develop or implement simple tasks like framing, flow control, error correction and detection.
- Analyze, develop and implement the client and server of a simple program over a transport layer.
- Implement the client and server of concurrent programs using Pthreads, Fork, Select and Poll over transport layer
- Study of simulation and analysis tools

List Of Exercises:

1. Write a program to implement framing.
2. Write a program to implement error correction & detection
techniques.

3. Implementation of routing protocols

4. Implementation of ARP

5. Write a socket program using TCP/UDP (IPv4 and IPv6) to implement the related applications as shown below:
   i. File Transfer
   ii. Domain Name System etc...

6. Simulation of sliding window protocols (Go back n, selective repeat etc.)

7. Program to implement connection / connectionless oriented concurrent server

8. Program to implement multicasting protocols

9. Study of simulation tools (NS2 and Qualnet)

10. Study of tools for analysing protocols (Wireshark)

11. Mini project on socket programming

13CS601: MULTIMEDIA SYSTEMS L T P C

3 0 0 3

Course Objectives:

- To understand the characteristics and architecture of multimedia systems
- To study the functions of various elements in multimedia
- To learn the working of multimedia components
- To be familiar with different multimedia tools
- To learn the methodologies for multimedia application development

Course Outcomes:

- Design an architecture for handling the multimedia stream
- Work with the various elements of multimedia system
• Encode multimedia data with various standards
• Develop animation, images, sound using Multimedia tools.
• Develop software for multimedia application

UNIT I  INTRODUCTION


UNIT II  ELEMENTS OF MULTIMEDIA


UNIT III  MULTIMEDIA CODING AND PACKAGING

Compression types and techniques – CODEC - GIF coding standards – Lossy and lossless – JPEG - MPEG-1,2,3,4 - MP3 – Authoring tools — Card and page based tools - Icon and object based tools – Time based tools - Cross platform authoring tools – Editing tools - Text editing and word processing tools - Painting and drawing tools - 3D modeling and animation tools - Image editing tools – Sound editing tools - Digital movie tools

UNIT IV  MULTIMEDIA APPLICATION DEVELOPMENT


UNIT V  INTRODUCTION TO MULTIMEDIA STREAMING

Streaming Media: Basics-Components-Process-Tools-Recording and reproduction-Broadcast standards-Recording formats and Environment-

TOTAL: 45 PERIODS

TEXTBOOKS:

REFERENCE BOOKS:

WEB REFERENCES:
Course Objectives:

- To understand the basics of cryptography
- To learn to identify the vulnerabilities in programs and to overcome them
- To create awareness of the different kinds of security threats in networks
- To study the security threats in databases and the solutions available
- To learn about the models and standards for security

Course Outcomes:

- Demonstrate knowledge of symmetric and asymmetric Encryption Algorithms like DES, AES and RSA
- Use hash functions and digital signatures for protecting messages and data.
- Secure programs and protect systems from malicious code
- Work with Firewalls, VPNs and IDSs to secure networks
- Identify the issues and solutions for implementing Security in Databases.
- Demonstrate knowledge of Secure SDLC, Bell Lapadula and Biba models and ISO 27000 family of standards

UNIT I  ELEMENTARY CRYPTOGRAPHY  9

UNIT II  PROGRAM SECURITY  9
Secure programs – Non-malicious program errors – Viruses – Targeted
malicious code – Controls against program threat – Control of access to
general objects – User authentication – Secure coding practices –
Vulnerabilities in web applications

UNIT III SECURITY IN NETWORKS
Threats in networks – Threat analysis – Encryption – Virtual Private
Networks – PKI – SSH – SSL – IPSec – content integrity – Access
controls – Wireless security – Honey pots – Traffic flow security –
Firewalls – Intrusion detection systems – Secure e-mail – Mobile
Security

UNIT IV SECURITY IN DATABASES
Security requirements of database systems – Reliability and integrity in
databases – Two phase update – Redundancy / internal consistency –
Recovery – Concurrency / consistency – Monitors – Sensitive data –
Types of disclosures – Inference

UNIT V SECURITY MODELS AND STANDARDS
Secure SDLC – Secure application testing – Security architecture models
– Trusted computing base – Bell LaPadula confidentiality model – Biba
integrity model – Graham Denning access control model – Harrison
Ruzzo Ulman model – Secure frameworks – COSO – CobiT –
Compliances – PCI DSS – Security standards - ISO 27000 family of
standards

TOTAL: 45 Periods

TEXTBOOKS:
2. Matt Bishop, “Introduction to Computer Security”, Addison-Wesley,
2004.

REFERENCE BOOKS:


WEB REFERENCES:


13CS603: SERVER-SIDE TECHNOLOGIES

Course Objectives:

- To study the functionality of World Wide Web Server using Servlet.
- To learn to develop web applications by separating presentation and logic using JSP.
- To design web applications using PHP
- To design web applications and develop websites using ASP.NET
- To develop and deploy web services.
- To build web applications using Ruby on Rails

Course Outcomes:

- Build applications using Servlet
- Ability to embed program code related to presentation within web document using JSP
• Generate dynamic response to client request using PHP
• Acquainted with ASP.NET a development framework for building web pages and web sites
• Capable of creating, describing, publishing and consuming the Web Service
• Rapidly develop database driven web application using Ruby on Rails

UNIT I  SERVLET AND JSP

Introduction to J2EE - Servlet - Life cycle - Parameter data - Sessions – Cookies – URL rewriting - Other servlet capabilities - Servlets and concurrency - Database connectivity.

MVC pattern: Separating programming and presentation - JSP technology - JSP expression language - JSP markup - JSTL core actions - JavaBeans classes and JSP - Tag libraries and files

UNIT II  PHP

Introduction - Form processing and business logic - Reading from a database - Using cookies – Session handling - Dynamic content generation

UNIT III  ASP.NET


UNIT IV  WEB SERVICES

Introduction – SOA - WCF service basics – SOAP – REST – JSON - Publishing and consuming: SOAP based WCF web services - REST based XML web services - REST based JSON - Session tracking in a SOAP based WCF Web Service - Database access and invoking a service from ASP.NET web services - Returning user defined types
UNIT V  RUBY ON RAILS, PYTHON

Introduction to Ruby : Data types - Simple input and output - Control statements - Fundamentals of arrays – Hashes – Methods – Classes - Code blocks and Iterators - Pattern Matching -Introduction to Ruby on Rails - Introduction to Python: Structure of python program – Statements – Simple programs using python

TOTAL: 45 Periods

TEXTBOOKS:

REFERENCE BOOKS:

WEB REFERENCES:
Course Objectives:

- To show the specifications of tokens of a language and design a scanner
- To study the different types of parser and design and implement a parser for a given grammar
- To represent the source code in a suitable intermediate code for the various programming language constructs
- To optimize the code at different levels for the reductions of size and/or execution of the compiled program
- To generate the machine code from the Intermediate code by considering the target machine architecture
- To understand the working of parallelizing compilers

Course Outcomes:

- Design a front end for a compiler
- Choose the right storage structure for the language constructs
- Select the appropriate intermediate code for the parsed source language
- Design and implement a simple code generator
- Apply the optimization techniques on the intermediate code and machine code
- Realize the internals of parallelizing compiler

UNIT I    FRONT END OF COMPILERS  9+3

The structure of compiler – Lexical analysis: Role of Lexical analyzer - Specification and recognition of tokens - Syntax Analysis: Top down parsing - Bottom up parsing - LR Parsers: SLR – CLR - LALR.

Lab Component: Lexical analyzer generators - Parser generators

UNIT II    INTERMEDIATE CODE GENERATION  9+3

Syntax Directed Definitions - Evaluation orders for syntax directed

**Lab Component:** Intermediate code generation of Expressions - Assignment statements with arrays - Control flow statements - Switch statements.

**UNIT III  OBJECT CODE GENERATION  9+3**


**Lab Component:** Code generation for any specific architecture supported by open source compilers

**UNIT IV  CODE OPTIMIZATION  9+3**


**Lab Component:** Exploring and customizing different types of optimizations supported by any open source compiler

**UNIT V  PARALLELIZING COMPILER  9+3**

Basic concepts and examples – Iteration spaces – Affine array indexes – Data reuse – Array data dependence - Finding synchronization free parallelism – Synchronization between parallel loops - Locality optimizations.

**Case study :** Open source parallelizing compilers

L : 45 ; P : 15 ; TOTAL: 60 Periods

**TEXTBOOKS:**


REFERENCE BOOKS:


WEB REFERENCES:

1. www.nptel.ac.in


13IT602: OBJECT ORIENTED ANALYSIS AND DESIGN  L T P C
(Common to CSE / IT)  3 0 0 3

Course Objectives:

- To develop background knowledge as well as core expertise in object oriented system.
- To provide the importance of the software design process.
- To assess Unified Modeling Language and use the UML design diagrams.
To learn basic OO analysis and design skills through an elaborate case study

To learn the appropriate usage of design patterns

Course Outcomes:

- Create use case documents that capture requirements for a software system.
- Create class diagrams that model both the domain model and design model of a software system.
- Create interaction diagrams that model the dynamic aspects of a software system.
- Address the real world problems by modeling software solutions using UML tools.
- Apply design patterns that facilitate development and evolution of new models

UNIT I  OOAD BASICS  8

UNIT II  STATIC MODELING  8
Use case Modeling - Relating Use cases – include, extend and generalization - Elaboration - Domain models - Finding conceptual classes and description classes – Associations – Attributes – Domain model refinement – Finding conceptual class hierarchies- Aggregation and composition- UML activity diagrams and modeling

UNIT III  DYNAMIC MODELING  9
System sequence diagrams – Communication diagrams - Relationship between sequence diagrams and use cases - Logical architecture and UML package diagram – Logical architecture refinement - UML class diagrams – Relationship – Inheritance – Abstract classes – Polymorphism - Operation contracts
UNIT IV DESIGN PATTERNS

UNIT V IMPLEMENTATION AND APPLICATION
Mapping design to code – Forward Engineering – Reverse Engineering - Test driven development – Refactoring – UML tools and UML as blueprint - UML state machine diagrams and modeling - UML deployment and component diagrams

TOTAL: 45 Periods

TEXTBOOKS:

REFERENCE BOOKS:

WEB REFERENCES:
Course Objectives:

- To enable the students of engineering and technology attain effective professional communication skills
- To train the aspirants to get through interviews successfully
- To make them successful corporates
- To upgrade the language proficiency level of engineering students

Course Outcomes:

- The students of Engineering and technology will be able to attain effective communication skills
- The students’ business communication will be enhanced
- The students will be enabled to acquire language proficiency
- The students will be able to face interviews

Vocabulary Building

Synonyms & antonyms, grammar: error spotting exercise, listening exercise, reading comprehension exercises, sequencing the jumbled sentences, cloze test

Speech Practice

Introducing all phonemes, consonants, vowels, diphthongs, stress pattern, sound recognition exercises

Business Correspondence

Nuances of effective presentation, corporate etiquette, body language, team skills, power dressing, writing memos, notice, agenda, circular, itinerary, ESP (speeches on special occasions: master of ceremony, welcome address etc.)
Interview Skills

Group Discussion, persuasive skills, negotiating skills, successful interview skills, resume designing, mock interviews, E-mail etiquette, drafting E-mail

TOTAL: 30 PERIODS

REFERENCE BOOKS:


13CS651: CLIENT SERVER TECHNOLOGIES

LABORATORY

Course Objectives:

- To create simple web pages using HTML5 and solve the appearance based problem using Cascading Style Sheets (CSS).
- To learn to create user interactive web pages using JavaScript.
- To work with different technologies related to XML
- To update contents of a document without reloading using AJAX with JSON.
- To learn to develop website using server side programming and scripting languages
- To learn to design web pages and develop websites using ASP.NET
To develop and deploy web services.

To experiment with Ruby and Python

**Course Outcomes:**

- Create increasingly appealing and powerful web pages using CSS and HTML elements
- Create interactive web pages using JavaScript and DOM.
- Represent web data using XML and perform translation using XSLT
- Generate dynamic response to client request using Servlet, JSP and PHP
- Design web pages using AJAX
- Develop a framework for building web pages and web sites
- Create and deploy web services
- Develop database driven web application using Ruby on Rails and Python

**Syllabus for the lab :**

1. Web page creation – using HTML5 and CSS3
2. Validating web form controls using JavaScript and DOM
3. Programs using XML – XSLT
4. Invoking java servlet programs from HTML forms
5. Create three-tier applications using JSP
6. Generate dynamic response to client request using PHP
7. Programs using AJAX with JSON
8. Develop website using ASP.NET
9. Implementing web services
10. Working with Ruby on Rails framework
11. Working with Python
12. Mini project

**TOTAL: 45 PERIODS**
REFERENCE BOOKS:


WEB REFERENCES:

2. http://www.w3schools.com/ xsl/default.asp

LIST OF SAMPLE EXERCISES

1. Create an html page named as “SimpleTags.html”. Add the following tags detail. Set the title of the page as “Simple HTML Tags” within the body perform the following
   - Moving text = “Simple HTML Tags”
   - Different heading tags ( h1 to h6)
   - Paragraph
   - Horizontal line
   - Line Break
   - Block Quote
   - Pre tag
   - Different Logical Style (<b>, <c>, <sub>, <sup>....)
   - Different Physical style (<code>, <del>, <kbd>...)
   - Listing tags
   a) Create a file external.html to include the external style sheet with necessary tag.
b) Create a file `internal.html` and include the internal style sheet for body tags & also use class name, so that the style can be applied for all tags.

c) Create “StyleSheetLinks.html” to include hyperlinks for `external.html` and `internal.html`.

d) Create an html page named as “mixedframe.html”. Divide the page into two columns of 25% & 75% size. In 25% display the html file named `SimpleTags.html` and divides the 75% into two rows. (50% & 50%). In the first 50% display the file “StyleSheetLinks.html” other 50% to display the files `external.html` and `internal.html` on clicking links in “StyleSheetLinks.html”

2. Display the calendar using JavaScript code by getting the year from the user. Create an html page named as “ValidateRegistration.html”

   a) Define a method name as “reset()” to be called when reset button is clicked and manually set all values of fields to default.

   b) Define a method name as “validate()” to be called when a button is clicked.

      1. Check for blank entry in name, age, email, phone no, radio button, checkbox and multiple selection listbox

      2. maximum number of characters in name>15, phoneno<10 digits, age>0 and age<50, check for valid format of email

      3. check whether at least one option is selected in list box

      4. Once all the values are properly filled make the submit button to be visible. On clicking the submit button display the values of all controls

   c) Define the various fields in form using table and make use of DOM for accessing the controls.

3. Create the `xml document` with XML DTD and XML schema for the tutorials which consists of a collection of tutorial. Each tutorial contains information such as name, URL. Display the `name` and `url`
from the XML document in a tabular format italicized and add a green background color to the "name" column and blue background color to the URL column.

4. Create a website for displaying the cricket score and update the score using Ajax and JSON

5. Write a Servlet program to display the amount to be paid by the user based on the make (eg. Nokia, Samsung etc..), model (eg. C3, A110 etc..) and quantity selected by the user. Use database to store details about mobile such as mobile make, mobile model, and price.

6. Design a Web page to display a set of questions and answer options. Use JSP to evaluate the answers selected by the user and calculates the marks. Insert the mark and name of the user into database and display marks to the user.

7. Design a HTML form page containing e-banking details with the card number (16 digits), account number, pin number and card validity periods (i.e., from & to). Write a PHP program that reads the data from the client, checks for all the validity and displays the account holder details. If any one of the data is invalid, then respective message has to be sent to the client.

8. Create a website for Library details Management using ASP.NET. Add textboxes for book name, author name, access no., publication year, edition, publisher, price and Button controls for Insert, Update and Delete from the database. Use the validation controls for validation and perform the needed operation

9. Create a web service for online shopping

10. Develop an application to upload a file and delete an existing file using Ruby on Rails
Course Objectives:

- To highlight the importance of object-oriented analysis and design and its limitations.
- To show how we apply the process of object-oriented analysis and design to software development.
- To point out the importance and function of each UML model throughout the process of object-oriented analysis and design and explaining the notation of various elements in these models.
- To provide the necessary knowledge and skills in using object-oriented CASE tools.

Course Outcomes:

- Construct various UML models (including use case diagrams, class diagrams, interaction diagrams, state chart diagrams, activity diagrams, and implementation diagrams) using the appropriate notation using the Rational Software Suite.
- Recognize the role and function of each UML model in developing object-oriented software.
- Work with object oriented CASE tools

List of Exercises

Practice the following for a given project

1. To develop a problem statement and Statement of Work.
2. Develop an IEEE standard SRS document. Also develop risk management and project plan (Gantt chart).
3. Identify Use Cases and develop the Use Case model.
4. Identify the business activities and develop an UML Activity diagram.
5. Identity the conceptual classes and develop a domain model with
6. Using the identified scenarios find the interaction between objects and represent them using UML Interaction diagrams.

7. Draw the State Chart diagram.

8. Identify the User Interface, Domain objects, and Technical services. Draw the partial layered, logical architecture diagram with UML package diagram notation and patterns


10. Practice forward engineering and reverse engineering

TOTAL: 45 Periods

13CS701: PATTERN RECOGNITION

Course Objectives:
- To learn the theory and function models required for pattern recognition
- To understand linear models for classification
- To study graphical and distance based models
- To exemplify the construction of tree and rule based models
- To learn to design model ensembles

Course Outcomes:
- Explain the theory and function models behind pattern recognition
- Use linear models for classification
- Build and infer from graphical and distance based models
- Apply tree and rule based model for decision making
- Design and implement model ensembles

UNIT I INTRODUCTION

Bias – Variance – Decomposition – Bayesian linear regression – Bayesian model comparisons – Evidence approximation – Limitations of fixed basis function

UNIT II  LINEAR MODELS FOR CLASSIFICATION  9+3

UNIT III  GRAPHICAL AND DISTANCE BASED MODELS  9+3
Bayesian Networks – Conditional independence – Markov random Bayesian networks – Inference in Graphical models – Neighbours and exemplars – Nearest neighbor classification – Distance based clustering – Hierarchical clustering – From kernels to distances

UNIT IV  TREE AND RULE BASED MODEL  9+3
Decision trees – Ranking and probability estimation trees – Tree learning as variance reduction – Learning ordered rule lists – unordered rule lists – Descriptive rule learning – First order rule learning

UNIT V  MODEL ENSEMBLES  9+3
Features – transformation – construction and selection – Bagging and Random forests – Boosting – Model ensembles: Bias - Variance – Margins – Other ensemble models – Meta learning

L : 45 ; P : 15 ; TOTAL: 60 Periods

TEXTBOOK:

REFERENCE BOOKS:

WEB REFERENCES:
1. www.nptel.ac.in

13CS702: ADVANCED COMPUTER ARCHITECTURE L T P C
3 0 0 3

Course Objectives:
- To expose the basic concepts of different types of parallelism.
- To study vector architecture and GPU architecture.
- To understand the different multiprocessor architectures and memory consistency models.
- To understand the architecture, issues and working of warehouse scale computers.
- To study the multicore architectures and their design issues.

Course Outcomes:
- Analyse the architecture of GPUs and warehouse scale computers.
- Develop parallel programs using CUDA programming language for GPUs.
- Analyse the performance of dynamic code scheduling and speculation.
- Explore the cache coherence protocols for symmetric and distributed shared memory system.
- Compare the performance of various synchronization mechanisms in a multiprocessor system.
• Analyse SMT and CMP architecture.
• Compare the features of multicore processor architectures.

UNIT I  INSTRUCTION LEVEL PARALLELISM  9
Classes of computers – Trends in technology, power, energy and cost –
Dependability – Measuring, Reporting and summarizing performance –
Quantitative principles of computer design –Classes of parallelism.
ILP: Concepts and challenges - Basic compiler techniques for exposing
ILP – Branch prediction- Dynamic scheduling – Hardware based
Speculation- Multiple issue and static and dynamic scheduling -
Limitations of ILP

UNIT II  VECTOR ,SIMD AND GPU ARCHITECTURES  9
Vector architecture - SIMD instruction set extensions for multimedia –
Graphics processing units - Detecting and enhancing loop level
parallelism - Case studies.

UNIT III  MULTIPROCESSOR ARCHITECTURE  9
Multiprocessor architecture: Issues and approach - Centralized shared
memory architecture — Multiprocessor cache coherence - Snooping
cache coherence protocols – Limitations - Distributed shared memory -
Directory based cache coherence protocols - Performance issues –
Synchronization - Models of memory consistency.

UNIT IV  WAREHOUSE-SCALE ARCHITECTURES  9
Programming models and workloads for Warehouse-Scale computers –
Architectures for Warehouse-Scale computing – Physical infrastructure
and costs – Cloud computing – Case studies.

UNIT V  MULTICORE ARCHITECTURES  9
Software and hardware multithreading – SMT and CMP architectures –
Design issues - Case studies: Intel multicore architecture – SUN CMP
architecture - Heterogeneous multicore processors - Case study: IBM
cell processor.

TOTAL: 45 Periods
TEXTBOOK:

REFERENCE BOOKS:

WEB REFERENCES:
4. www.nptel.ac.in

13CS703: COMPUTER GRAPHICS L T P C
(Common to CSE / IT) 3 0 0 3

Course Objectives:
• To learn the output primitives like line, circle and ellipse using algorithms.
• To study the 2-D and 3-D viewing and transformations.
• To understand various visible surface detection techniques, color models and animation techniques.
• To motivate the students to create the 3-D scenes by adding textures, shadows and shades to the objects in the scene.
• To enable the students to create the fractal images and compound objects through Boolean operations on basic objects.

Course Outcomes:
• Develop the line, circle and ellipse drawing algorithms
• Apply the two dimensional and three dimensional geometric transformations
• Perform the line, polygon, curve and text clipping
• Represent 2-D and 3-D objects
• Work with color models such as RGB, YIQ, CMY, HSV
• Apply different methods for image rendering
• Create the fractal images

UNIT I 2-D PRIMITIVES
Output primitives – Line, circle and ellipse drawing algorithms
Attributes of output primitives – Two dimensional geometric transformation - Two dimensional viewing – Line, Polygon, Curve and text clipping algorithms

UNIT II 3-D CONCEPTS
Parallel and perspective projections - Three dimensional object representation – Polygons, Curved lines – Splines - Quadric surfaces - Visualization of data sets - 3D transformations – Viewing - Visible surface identification

UNIT III GRAPHICS PROGRAMMING
UNIT IV RENDERING

Introduction to shading models – Flat and smooth shading – Adding texture to faces – Adding shadows of objects – Building a camera in a program – Creating shaded objects – Rendering texture – Drawing shadows

UNIT V FRACTALS

Fractals and self similarity – Peano curves – Creating image by iterated functions – Mandelbrot sets – Julia sets – Random fractals – Overview of ray tracing – Intersecting rays with other primitives – Adding surface texture – Reflections and transparency – Boolean operations on objects

TOTAL: 45 PERIODS

TEXTBOOKS:


REFERENCE BOOKS:


WEB REFERENCES:

1. www.nptel.ac.in


3. http://www.moshplant.com/direct-or/bezier/

Course Objectives:
- To study the details of lower layers of mobile architectures in the context of pervasive computing and mobile applications
- To introduce the characteristics, basic concepts and systems issues in mobile and pervasive computing

Course Outcomes:
- Discover the characteristics of pervasive computing applications including the major system components and architectures of the systems
- Analyze the strengths and limitations of the tools and devices for development of pervasive computing systems
- Exploit the characteristics of different types of mobile networks

UNIT I  PERVASIVE COMPUTING
Basics and vision – Architecture and applications requirements – Smart devices and operating systems - Secure services – Smart mobiles, cards and device networks

UNIT II  MOBILE APPLICATIONS

UNIT III  MEDIUM ACCESS AND TELECOMMUNICATIONS

UNIT IV  WIRELESS NETWORKS
Infrared vs radio transmission – Infrastructure and adhoc networks – WLAN, IEEE 802.11 standards protocols. Piconet – Bluetooth -
Architecture and services - Wireless Broadband networks and satellites networks – Wifi – WiMAX

UNIT V MOBILE NETWORK AND TRANSPORT LAYERS 9
Mobile IP – DHCP – Routing in Mobile adhoc networks - Proactive and reactive routing protocols– TCP improvements – TCP over 2.5/3G.

TOTAL: 45 Periods

TEXTBOOKS:

REFERENCE BOOKS:

WEB REFERENCES:
2. www.cse.iitk.ac.in/users/rkg/Talks/mobile_main.pdf
4. www.astm.org/Standards/E2213.htm
5. www.explainingcomputers.com/mobile.html
Course Objectives:

- To understand the concept of cloud and utility computing.
- To understand the various issues in cloud computing.
- To familiarize themselves with the types of virtualization.
- To familiarize themselves with the lead players in cloud.
- To appreciate the emergence of cloud as the next generation computing paradigm.

Course Outcomes:

- Recognize the architecture, challenges and reference models of cloud computing.
- Discuss on various virtual machine models and techniques.
- Explore the various cloud programming and software environment.
- Identify the use of high throughput and data intensive computing.
- Explore the different Cloud Platforms and Application.

UNIT I    INTRODUCTION, PRINCIPLES AND ARCHITECTURE


UNIT II    VIRTUALIZATION

Characteristics of virtualized environments - Taxonomy of virtualization techniques - Execution virtualization - Machine reference model - Hardware-level virtualization – Hypervisors - Hardware virtualization techniques - Operating system-level virtualization - Programming
language-level virtualization - Application-level virtualization - Other types - Virtualization and cloud computing - Pros and cons of virtualization - Technology examples - Xen: Paravirtualization - VMware: full virtualization - Full virtualization and binary translation - Microsoft Hyper-V.

UNIT III CLOUD INFRASTRUCTURE


Case Study: Amazon Web Service reference, GoGrid, Rackspace.

UNIT IV CLOUD PROGRAMMING AND SOFTWARE ENVIRONMENT


Case Study: Amazon Web Service reference, GoGrid, Rackspace.

UNIT V CLOUD PLATFORMS AND APPLICATION

Amazon web services - Compute services - Storage services - Communication services - Google AppEngine - Architecture and core concepts – Cloud Security and Trust management.


TOTAL: 45 Periods
TEXTBOOKS:

REFERENCE BOOKS:
2. George Reese, “Cloud Application Architectures: Building Applications and Infrastructure in the Cloud” O'Reilly

WEB REFERENCES:

13CS751: COMPUTER GRAPHICS AND MULTIMEDIA LABORATORY

Course Objectives:
- To learn to experiment with the drawing and clipping algorithms
- To learn to experiment the 2-D and 3-D transformations
- To learn to implement the data compression algorithms
- To learn to develop creativity using Animation Software

Course Outcomes:
- Implement various graphics algorithms
• Implement colour conversion algorithms
• Implement data and image compression algorithms
• Design and develop basic animations using any animation software

SYLLABUS FOR THE LAB:

1. Implementation of Bresenham’s Algorithm with attributes—Line, Circle, Ellipse.
2. Composite 2-D Transformations using Translation, Rotation, Scaling, Shearing and Reflection
3. Cohen Sutherland 2-D line Clipping and Windowing
4. Sutherland – Hodgeman Polygon Clipping Algorithm
6. Generation of fractal images
7. Conversion between Colour models.
8. Implementation of text compression algorithms
9. Implementation of image compression algorithms
10. Animation using any animation software

TOTAL: 45 PERIODS

REFERENCE BOOKS:


WEB REFERENCES:


List of Sample Exercises

1. Write a program to draw the following shape using line, circle and ellipse drawing algorithm with different attributes.
2. Write a program to draw a pentagon and then do all the 2D composite transformation on the pentagon.
3. Write a program to draw a star and clip that star using Cohen-Sutherland line clipping algorithm
4. Write a program to draw any convex polygon and clip that convex polygon using Sutherland – Hodgeman Polygon clipping algorithm
5. Write an OpenGL program to draw a tea pot and apply composite 3D transformation on it.
6. Write an OpenGL program to draw Koch curve and dragon curve.
7. Write a program to implement color conversion models by converting from (a) HSV to RGB (b) RGB to CMY
8. Write a program to implement the Run length encoding compression scheme.
9. Write a program to implement the JPEG compression scheme
10. Using Flash, create an animation to illustrate the action event.

13CS752: MOBILE APPLICATION DEVELOPMENT L T P C
LABORATORY 0 0 3 2

Course Objectives:
- To apply the fundamentals of programming for mobile devices.
- To model graphical user interfaces and apply event-driven programming for mobile devices
- To demonstrate mobile application development tools and APIs

Course Outcomes:
- Evaluate the problem statement and select appropriate models for
development.

- Select and evaluate suitable software tools and APIs for the development of a particular mobile application and understand their strengths, scope and limitations.
- Use an appropriate application development tool to design, develop and test small interactive programs for mobile devices.

LIST OF EXPERIMENTS
1. General form design
2. Mobile browser based interactive applications
3. Applications using controls
4. Mobile networking applications (SMS/Email)
5. Applications involving data retrieval
6. Launching services in a mobile phone
7. Web portal development
8. Applications using Android SDK framework (like interactive applications, applications that make use of accelerometer sensor, video applications)
9. Applications that use the iPhone SDK framework
10. Application using Windows Mobile OS
11. Testing the applications using emulators
12. Mini Project

TOTAL: 45 PERIODS

LABORATORY REQUIREMENTS
1. JDK environment
2. J2ME
3. Sun Java Wireless Toolkit
4. Android SDK
5. iPhone SDK
List of Sample Exercises

1. Course Registration Form development (Signup form)

2. Develop a MIDlet application for following kind of menu
   - cut
   - copy
   - paste
   - delete
   - selectall

3. a) Develop an application which will take the text as input from a text field and display it in another text field or label (Use Swing).
   b) Create a slideshow which has three slides which includes only text. Program should change to the new slide after 5 seconds. After the third slide program returns to the First Slide

4. Develop your own address book application which can take input as name, phone number, email id and store in a file. This data should be persistent, so that next time user can view this data through same application

5. Creating a simple UDP based client-server application

6. Login to HTTP server from a J2ME program. This J2ME sample program shows how to display a simple Login screen on the J2ME phone and how to authenticate to a HTTP server.
   Note: Use Apache Tomcat Server as web server and fetch the required data value/information (J2ME application do authentication to the backend server)

7. The following should be carried out with respect to the given set of application domains:
   a. Student Marks Enquiry
   b. Students Admission system
   c. Railway (PNR) Enquiry/Status
   d. Public Exam Result Enquiry
8. Write an Android application program that accepts a name from the user and displays the hello name to the user in response as output using Eclipse
   • Change the text color for RGB (or) applications that make use of accelerometer sensor(accelerometer API)

9. Iphone application
   A. Write a program to display digital clock using threads(Simple Program)
   B. Graphics apps in Android
      a. Create an application where different shapes of different colors are displayed.
      b. Create an application to show a cyclist moving from one direction to another
   C. Animation apps like
      a. Bouncing ball
      b. Moving arrow, etc

10. Develop and test Game creation in android using iphone SDK emulator like
    a. Shooting bubbles
    b. Shooting arrows
    c. Simple snake game, etc.

11. Develop windows mobile OS application for Student course registration details.

13CS753: INNOVATIVE APPLICATION PROJECT (Internal Assessment Only)

Objective of the Innovative Application Project:
• Select a domain of social interest and provide a solution in a completed form
• Inculcate the software engineering practices for effective learning
of industrial approaches

Guidelines:

- **Choosing a Project Topic**
  - Enough amount of time should be dedicated for deciding the topic. Current technical issues can be taken and addressed using latest technologies or students can approach any faculty member to guide them in choosing the topic (Refer to Sample Projects given below)

- **Project Planning**
  - The entire roadmap of the project (Chart like Gantt chart) is to be prepared and submitted to the respective guide for approval. The project plan should explain 4Ws+H, which means **What** is going to be done, **When** it is going to be done, **Who** is going to do it, **Where** this is going to be done, and **How** it is going to be done.

- **Requirement Elicitation and Analysis**
  - The requirement needs to be collected from the users of the domain. Careful gathering of requirements needs to be performed and they need to be prioritized and listed. Also, the use case diagram needs to be drawn to model the requirement scenarios.

- **Design**
  - The project modules need to be identified and architecture diagram should be drawn to show the dependency between the modules. The detailed function specification has to be written for each function inside the modules.

- **Implementation**
  - The implementation has to be done using the preferred language and tools. It has to be in par with the design and should never get deviated from the design.
• Testing
  ▪ Test cases need to be listed out for all functionalities of the project and the procedure for carrying out the test needs to be documented. The testing has to be conducted as per the test procedures and the results should be recorded.

• Project Review and Final Presentation
  ▪ At least three intermediate project reviews will be conducted from the department and the project proceedings will be assessed. The comments given in the review should be incorporated into the project within time as per the project plan.
  ▪ The Final presentation / demonstration will be conducted from the department to assess the overall performance of the project team / individual and the completion of the project.

• Report Preparation
  ▪ The template for the project report will be provided by the co-coordinator and it needs to be completed as per the guidelines. The report need to get assessed from both the project guide and the Head of the Department

• Any assumptions made should be clearly indicated

Sample Projects:

1. **Barcode Scanner** – Mobile Application
   • This mobile/ tablet application needs to scan barcodes on products then look up prices and reviews. The application may also need to scan Data Matrix and QR Codes containing URLs, contact info, etc.

2. **Sudoku game** – Mobile Application
   • This mobile/ tablet application needs to implement the Sudoku game which needs to be better than all other available Sudoku app. The game algorithms need to be implemented in an effective way to minimize the RAM usage.
3. **File Splitter and Merger** – Desktop Application

- This desktop application is used to split any type of large file into smaller size which is easy for mailing them over Internet. Also the application should merge all the small files into one which can be used in future.

4. **ATM Simulator** – Desktop Application

- This desktop application should simulate the complete ATM machine. This simulator can be used in the banks for testing the ATM transactions. Actions like card entry and cash dispensing are to be animated to provide a realistic user interface.

5. **Pharmacy Management System** – Web Application

- This web application should automate all the manual data entry work in pharmacy. The stock inventory maintenance, purchase, sales modules needs to be incorporated in this project. The report generation module can query, consolidate and present the user required information from the data stored.

### 13HS801: PRINCIPLES OF MANAGEMENT AND ENGINEERING ECONOMICS

**L T P C**

3 0 0 3

**Course Objectives:**

- To outline the historical evolution of management theories.
- To describe the relationship between management and society
- To highlight the four management functions of planning, organizing, leading, and controlling.
- To provide students with fundamental concepts of engineering economics.
- To expose students to costs involved in production, demand and supply in business
Course Outcomes:

- Enumerate the historical evolution of management thought.
- Identify the internal and external factors and forces of the organisation that managers must confront in their daily work.
- Bring out the functions of management: such as planning, organising, leading, controlling, and decision making.
- Use the basic concepts and terminology in economics.
- Comprehend the factors of production, different costs in business and pricing methods.

UNIT I MANAGEMENT AND SOCIETY


UNIT II PLANNING, ORGANISING AND STAFFING


UNIT III LEADING AND CONTROLLING


UNIT IV INTRODUCTION TO ECONOMICS I

Definition - Scope and nature of economics - Micro economics: Demand - Types of demand - Determinants of demand - Law of demand - Demand function - Elasticity of demand - Market equilibrium - Production function - Types of costs - Economic costs: Fixed cost and variable costs - Direct and indirect costs - Average and marginal costs - Implicit cost -
Opportunity cost - Pricing Methods - Break even analysis.

UNIT V  INTRODUCTION TO ECONOMICS II


TOTAL: 45 Periods

TEXTBOOKS:


REFERENCE BOOKS:


WEB REFERENCES:

1. http://www.finmin.nic.in
2. planningcommission.nic.in
3. www.rbi.org.in
Course Objectives:
- To explain models of and issues in concurrency in computing
- To introduce message-passing parallel programs using MPI
- To elaborate shared-memory parallel programs using Pthreads
- To explain shared-memory parallel programs using OpenMP
- To familiarize with parallel programming using MPI, Pthreads and Open_mp.

Course Outcomes:
- Realize hardware level support for concurrency
- Identify issues in parallel programming
- Develop message-passing parallel programs using MPI framework
- Develop shared-memory parallel programs using Pthreads
- Develop shared-memory parallel programs using OpenMP

UNIT I  PARALLEL HARDWARE AND PARALLEL SOFTWARE

Need for parallel systems and parallel programs - The von Neumann architecture - Modifications to the von Neumann Model - Parallel Hardware - Parallel Software - Input and Output - Performance - Parallel Program Design - Writing and Running Parallel Programs

UNIT II  DISTRIBUTED MEMORY PROGRAMMING WITH MPI

UNIT III SHARED MEMORY PROGRAMMING WITH Pthreads

UNIT IV SHARED MEMORY PROGRAMMING WITH OpenMP

UNIT V PARALLEL PROGRAM DEVELOPMENT
Parallel odd-even transposition sort-Two n-Body Solvers- Parallelizing the n-body solvers- Parallelizing the basic and reduced solver using OpenMP- Parallelizing the solvers using pthreads- Parallelizing the basic and reduced solver using MPI. Recursive and no recursive depth first search - Parallelizing tree search-static and dynamic parallelization of tree search using Pthreads-Parallelizing the tree-search programs using OpenMP-Implementation of tree search using MPI.

TOTAL: 45 PERIODS

TEXT BOOKS:

REFERENCE BOOKS:

WEB REFERENCES:
5. www.nptel.ac.in

ELECTIVE I (Electives for VI Semester)

13MA902: COMBINATORICS AND GRAPH THEORY

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Course Objectives:
- To introduce topics and techniques of combinatorics methods.
- To learn the basics of combinatorics: enumeration, recurrence, generating Functions
- Understanding the elements of Graph Theory.
- To introduce the students about graphs, their properties and their applications as models of networks.
- To solve theoretical problems and apply them in algorithms based on graph structures.

Course Outcomes:
- Able to know the permutations and combinations for all possible results in an experiment.
- Able to use generating functions to solve a variety of combinatorial problems.
- Able to formulate problems in terms of graphs.
• Have knowledge of the graph theoretic concepts needed for some algorithms.
• Solve graph theoretic problems and apply algorithms taught in the course.

UNIT I COMBINATORICS
The pigeon-hole principle - Basic counting problems- The binomial coefficients (the binomial theorem, algebraic vs. combinatorial proof, Pascal's identity, Pascal's triangle, Catalan numbers) - the principle of inclusion and exclusion.

UNIT II RECURRENCES
Fibonacci numbers - The substitution method- Linear recurrences (mostly homogenous recurrences, the characteristic polynomial/equation)- Generating functions-(Catalan numbers revisited, divisions of a number

UNIT III INTRODUCTION TO GRAPH THEORY
Definition - examples – subgraphs – complements and graph isomorphism – Euler trail and circuits – planar graphs – Hamilton paths and cycles.

UNIT IV TREES
Definition – rooted trees – trees and sorting – weighted trees and prefix codes – bi connected components and Articulation points.

UNIT V OPTIMIZATION AND MATCHING

TOTAL: 45 PERIODS

TEXTBOOK:

REFERENCE BOOKS:
1. Douglas B. West, “Introduction to Graph Theory”, Prentice-Hall of

2. Narsingh Deo, “Graph Theory with applications to Engineering and Computer Science”, Prentice-Hall of India, New Delhi, Reprint, 2011.


13CS902: COMPUTATIONAL INTELLIGENCE  

Course Objectives:

- To learn the concepts of artificial intelligence
- To study problem solving techniques
- To understand the representation of knowledge and reasoning mechanism
- To learn to construct plans of actions
- To study network models used for reasoning in uncertainty
- To know how to learn from samples of data

Course Outcomes:

- Formulate a problem and find the solution using searching techniques
- Use the knowledge and the process of inference to derive new representations
- Represent planning problems and find the sequence actions to achieve goals
- Build network models to reason under uncertainty
- Design and apply learning models
UNIT I  INTRODUCTION  9

UNIT II  KNOWLEDGE AND REASONING  9
Logic Agent : Knowledge based agent - Wumpus world - Logic - Propositional logic - Syntax and Semantic of FOL - Using FOL - Knowledge engineering in FOL - Propositional vs First order inference - Unification and Lifting - Forward chaining - Backward chaining - Resolution

UNIT III  PLANNING  9
Classical Planning : Definitions - Examples - Algorithms for Planning as state space search - Planning graphs - Planning and acting in the real world : Time, Schedule and Resources - Hierarchical planning - Planning and acting in Non deterministic domain

UNIT IV  UNCERTAIN KNOWLEDGE AND REASONING  9
Quantifying uncertainty - Acting under uncertainty - Basic probability notation - Inference using full joint distribution - Probabilistic Reasoning - Semantics of Bayesian networks - Bayesian nets with continuous variable - Exact inference in Bayesian networks

UNIT V  LEARNING  9
Forms of learning - Supervised learning - Learning decision trees - Artificial neural networks - Support vector machine

TOTAL: 45 Periods

TEXTBOOKS:

REFERENCE BOOKS:

WEB REFERENCES:

13CS903: SYSTEM MODELING AND SIMULATION L T P C
3 0 0 3

Course Objectives:
- To study the need for simulation
- To learn to model a real world system
- To understand the structure of data at different stages of a system
- To study how to verify and validate the components of the system
- To learn to deploy the simulation tools

Course Outcomes:
- Select a simulation model
- Analyze the behavior of the system using various models
- Characterize and formulate the data applicable for the system simulation
- Verify and Validate the behavior of the system
- Deploy the simulation tools in real world problems

UNIT I INTRODUCTION TO SIMULATION
Introduction – Simulation terminologies - Application areas – Model classification - Types of Simulation - Steps in a simulation study - Concepts in discrete event simulation example.

UNIT II MATHEMATICAL AND STATISTICAL MODELS
models – Characteristics - Notation Queueing Systems – Markovian Models - Properties of random numbers - Generation of pseudo random numbers - Techniques for generating random numbers - Testing random number generators - Generating random variates - Inverse transform technique acceptance - Rejection technique – Composition and convolution method.

UNIT III ANALYSIS OF SIMULATION DATA


UNIT IV VERIFICATION AND VALIDATION

Model Building – Verification of simulation models – Calibration and validation of models – Validation of model assumptions – Validating input - Output transformations.

UNIT V SIMULATION OF COMPUTER SYSTEMS AND CASE STUDIES

Simulation tools – Model input – High level computer system simulation – CPU – Memory simulation – Comparison of systems via simulation – Simulation programming techniques - Development of simulation models.

TOTAL: 45 PERIODS

TEXTBOOKS:


REFERENCE BOOKS:


WEB REFERENCES:


13CS904: PRINCIPLES OF DISTRIBUTED SYSTEMS L T P C 3 0 0 3

Course Objectives:

- To study various models of distributed systems and understand how communication among distributed systems is made.
- To learn about the architecture and issues of distributed file systems
- To understand about logical clocks and recording global state.
- To study how mutual exclusion is achieved in a distributed system
- To study about distributed transaction management and concurrency control
- To understand how security and fault tolerance are enforced in a distributed system

Course Outcomes:

- Analyse the various architecture and fundamental models of distributed systems
- Order events in a distributed system using logical clocks.
• Compare the various distributed mutual exclusion algorithms
• Find out the issues in distributed transaction management
• Compare the working of various concurrency control algorithms.
• Analyse the various security mechanisms used in a distributed system
• Explore the need for fault tolerance.

UNIT I  INTRODUCTION
Introduction to distributed systems - Challenges - Architectural models - Fundamental models - P2P systems - Introduction to inter process communications - External data representation and marshalling - Client server communication - Group communication – Multicast - Energy Efficient Computing - Cloud computing

UNIT II  DISTRIBUTED OBJECTS AND FILE SYSTEM
Introduction - Communication between distributed objects - Remote procedure call - Events and notifications - Java RMI case study - Introduction to DFS - File service architecture – Google file system - Introduction to name services - Name services and DNS - Directory and directory services - Cluster computing - Map reduce/big table.

UNIT III  DISTRIBUTED OPERATING SYSTEM
The operating system layer – Protection - Process and threads - Communication and invocation - Operating system architecture - Introduction to time and global states - Clocks, Events and Process states - Synchronizing physical clocks - Logical time and logical clocks - Global states - Distributed mutual exclusion - Overlay Networks – Distributed Hash Table.

UNIT IV  DISTRIBUTED TRANSACTIONS MANAGEMENT
Transactions – Nested transaction – Locks - Optimistic concurrency control - Timestamp ordering - Comparison of methods for concurrency control - Introduction to distributed transactions - Flat and nested distributed
transactions - Atomic commit protocols - Concurrency control in distributed transactions - Distributed deadlocks - Transaction recovery – Data Intensive Computing and Map Reduce

UNIT V SECURITY AND FAULT TOLERANCE

Overview of security techniques - Cryptographic algorithms – Digital signatures - Cryptography pragmatics – Distributed Replication - Content Delivery Networks and replication.

TOTAL: 45 Periods

TEXTBOOKS:

REFERENCE BOOKS:

WEB REFERENCES:
1. http://lass.cs.umass.edu/~shenoy/courses/spring05/lectures/Lec10.pdf
5. www.nptel.ac.in
Course Objectives:

- To learn the fundamentals of database tuning
- To study the indexing mechanisms for organizing data
- To understand the significance of Query Optimization
- To learn to troubleshoot database issues
- To understand the need for time series and distributed databases

Course Outcomes:

- Analyze different execution plans for queries
- Design an indexing mechanism to make effective retrieval from database
- Create an execution plan for a query to reduce the execution time
- Optimize the retrieval in query processing
- Analyze the query response using data dictionaries
- Work with time series and distributed databases

UNIT I  FUNDAMENTALS OF TUNING  8
Review of relational databases – Relational algebra - Locking and concurrency control – Correctness consideration – Lock tuning – Logging and the recovery subsystem – Principles of recovery – Tuning the recovery subsystem – Operating systems considerations – Hardware tuning

UNIT II  INDEX TUNING  8
Types of queries – Data structures – B tree – B+ Tree - Hash structures – Bit map indexes – Clustering indexes – Non clustering indexes – Composite indexes – Hot tables – Comparison of indexing and hashing techniques

UNIT III  QUERY OPTIMIZATION  10
Techniques - Tuning relational systems – Normalization – Tuning denormalization – Clustering two tables – Aggregate maintenance –
UNIT IV TROUBLESHOOTING

Query plan explainers – Performance monitors – Event monitors – Finding "Suspicious" queries – Analyzing a query’s access plan – Profiling a query execution – DBMS subsystems

UNIT V CASE STUDIES

Transaction chopping – Time series databases – Understanding access plans – Configuration parameters: Oracle; SQL Server; DB2 UDB – Distributed database - Implementation

TOTAL: 45 Periods

TEXTBOOKS:


REFERENCE BOOKS:


WEB REFERENCES:

1. http://www.youtube.com/watch?v=dH_bPLtbd4c

2. www.cs.nyu.edu/courses/fall08/G22.2434-001/dbtune.ppt

3. moosehead.cis.umassd.edu/cis552/slides/Tuning.ppt

4. www.itu.dk/people/phbo/Tuning/Slides/IndexTuning.pptx

5. codex.cs.yale.edu/avi/db-book/db4/slide-dir/ch14.ppt
Course Objectives:
- To explore the basics and goals of E-Learning
- To understand E-Learning strategies
- To understand the principles of E-Learning and its applications
- To introduce various design techniques of E-Learning
- To discuss the methods of implementing E-Learning contents

Course Outcomes:
- Bring out the features of E-Learning
- Establish the E-Learning in various domains by following appropriate strategies
- Apply the principles of E-Learning
- Design E-Learning solutions using various techniques
- Implement the E-Learning solutions according to the needs.

UNIT I  INTRODUCTION 9
E-Learning cycle - E-Learning types - Challenges and opportunities – Cognitive presence – Approaches to design E-Learning - E-Learning framework - 6C framework - E-Learning Tools

UNIT II  E-LEARNING STRATEGY 9

UNIT III  PRINCIPLES OF E-LEARNING 9
Philosophy of E-Learning – Theory of learning – Applying principles of multimedia - Applying principles of contiguity - Applying principles of modality - Applying principles of redundancy - Applying principles of coherency - Applying principles of personalization - Web based learning
UNIT IV  DESIGN
Online E-Learning technologies – Visual communication techniques - Computer based technologies - Computer Mediated Communication (CMC) - Assessment and evaluation - Organizing and designing learning sequences - Characteristics of Interactive online learning media

UNIT V  IMPLEMENTATION
Leverages example in E-Learning – Collaborative E-Learning - Learner control in E-Learning guidelines to solve issues in E-Learning – Implementation of an E-Learning Course Content for a complete online course - Research in content retrieval and generation for E-Learning - Role of cloud and semantic Grid in E-Learning

TOTAL: 45 Periods

TEXTBOOKS:

REFERENCE BOOKS:

WEB REFERENCES:
3. http://hippocampus.org
4. http://www.youtube.com/user/eLearnerEngaged

13CS907: NETWORK ANALYSIS AND MANAGEMENT

Course Objectives:

- To learn network analysis and flow analysis with a network tool.
- To understand the design issues and architecture to meet the network communication requirements.
- To understand how network management technology works to manage today’s systems.
- To study about the network management organization
- To understand the effectiveness of management assessment

Course Outcomes:

- Do requirement analysis for network design
- Address the routing and security issues in networks.
- Work with management lifecycle and management reference models.
- Design common management protocols
- Assess the impact of management and its effectiveness

UNIT I  INTRODUCTION

UNIT II  ARCHITECTURE
Network architecture – Addressing and routing architecture – Performance architecture – Security and privacy architecture – Network analysis tool
UNIT III  NETWORK MANAGEMENT

Network management overview - Management perspective:
Dimensions of the management: Management interoperability -
Management life cycle - Management layers – Management functions
and reference models

UNIT IV  NETWORK MANAGEMENT ORGANIZATION

Management information – Management communication patterns:
Rules of conversation - Common management protocols –
Management organization

UNIT V  MANAGEMENT INTEGRATION

Applied network management: Management integration – Service
level management – Management metrics: Assessing management
impact and effectiveness – Case Study: NMS, Organization Network

TOTAL: 45 Periods

TEXTBOOKS:

1. James D.McCabe, “Network Analysis, Architecture and

REFERENCE BOOKS:

2. Laura Chappell and Gerals combs, “Wireshark Network
   1&2”, 3rd Edition, 1999

WEB REFERENCES:

ELECTIVE II (Electives for VII Semester)

13CS908: HUMAN COMPUTER INTERACTION
(Common to CSE / IT)

Course Objectives:

- To understand the design principles of Human Computer Interaction.
- To study the effectiveness of interacting with computers.
- To learn the various models that can be used for designing systems.
- To understand the importance of design techniques.
- To learn to design dialog for representation.

Course Outcomes:

- Design the Human Computer Interaction (HCI) process
- Evaluate the performance of interactive systems
- Identify the appropriate design model for HCI
- Analyze and test the HCI models
- Postulate appropriate HCI dialog techniques

UNIT I  DESIGN PROCESS  9


UNIT II  DESIGN AND EVALUATION OF 9 INTERACTIVE SYSTEMS


UNIT III MODELS


UNIT IV EXPERIMENTAL DESIGN AND STATISTICAL ANALYSIS OF HCI


UNIT V THEORIES


TOTAL: 45 PERIODS

TEXTBOOKS:


REFERENCE BOOKS:

WEB REFERENCES:
5. www.hcibib.org

13CS909: GREEN COMPUTING
L T P C
3 0 0 3

Course Objectives:
- To study about green IT fundamentals and strategies
- To understand green business process management and green enterprise architecture
- To study the structure of green grid framework
- To understand socio-cultural aspects of green IT
- To recognize environmentally responsible business strategies

Course Outcomes:
- Realize the impact of green computing in IT
• Identify green assets and model them
• Analyze the green grid framework.
• Work with green compliance and standards
• Work with green business management tools

UNIT I  FUNDAMENTALS


UNIT II  GREEN ASSETS AND MODELING


UNIT III  GRID FRAMEWORK

Virtualizing of IT systems – Role of electric utilities, telecommuting, teleconferencing and teleporting – Materials recycling – Best ways for green PC – Green data center – Green grid framework

UNIT IV  GREEN COMPLIANCE


UNIT V  CASE STUDIES

The Environmentally Responsible Business Strategies (ERBS) – Case study scenarios for trial runs – Case studies – Applying green IT strategies and applications to a home, hospital, packaging industry and telecom sector.

TOTAL: 45 PERIODS
TEXTBOOKS:

REFERENCE BOOKS:

WEB REFERENCES:
1. http://www.studyhelpline.net/hot_it_topics/green_computing/
2. http://shodhganga.inflibnet.ac.in/bitstream
4. www.green-compute.com

13CS910: BIO INFORMATICS TECHNOLOGIES

Course Objectives:
- To understand basic concepts of molecular biology and genetics
- To study about different biological databases
- To understand the different techniques for sequence data analysis
- To study about the evolutionary relationships using phylogenetic trees
• To understand computer as a tool for biomedical research and important functional relationships from gene data.

Course Outcomes:
• Apply machine learning techniques in molecular biology
• Work with different types of biological databases
• Analyze various techniques for sequence data processing
• Use phylogenetic trees for evolutionary relationships
• Apply computational techniques for molecular structure analysis

UNIT I  INTRODUCTION TO BASICS OF BIOLOGY  
Introduction to molecular biology – The genetic material – Central
dogma of life – Nucleic acids-Gene structure – Genomic information –
RNA and its structure - Protein structure basics – Amino acids –
Polypeptide composition – Protein primary, secondary and tertiary
structure – Machine learning introduction.

UNIT II  DATABASES  
Molecular databases introduction - Protein and Nucleotide databases -
Different kinds of databases – Extracting sequences from databases –
Searching for sequences using BLAST family of algorithms and FASTA
algorithm – Applications.

UNIT III  SEQUENCE DATA ANALYSIS  
Simple alignments – Gaps – Scoring matrices – Dynamic programming
– Global and local alignments algorithms – Multiple sequence
alignments - Motif representation – Motif finding algorithms – Tools used
for alignments and motif detection - Genomics – Prokaryotic and
eukaryotic genomes: Gene structure prediction – Gene expression
analysis – Microarrays.

UNIT IV  PHYLOGENETICS  
Phylogenetics – History and advantages – Phylogenetic trees –
Evolutionary rates – Molecular clocks – Evolution in organelles -
Distance matrix methods – UPGMA and neighbor joining methods -
Maximum likelihood approaches – Parsimony–Tree validation –
Constructing consensus trees using Bootstrapping techniques – Comparison of phylogenetic methods – Phylogenetic tree construction tools.

UNIT V  COMPUTATIONAL PREDICTIONS OF MOLECULAR STRUCTURES

Protein secondary structure, tertiary and quaternary structure prediction – Algorithms for modeling protein folding – Predicting RNA secondary structures - Inhibitors and drug design – system biology introduction and its applications in whole cell modeling - Protein visualization tools.

TOTAL: 45 Periods

TEXTBOOKS:


REFERENCE BOOKS:


WEB REFERENCES:

2. www.nptel.ac.in
13CS911: MACHINE TO MACHINE COMMUNICATION                        L T P C
                                                 (Common to CSE / IT)                     3 0 0 3

Course Objectives:

- To study the details of main components that comprises a M2M solution.
- To understand M2M requiremental uses cases.
- To outline the ETSI M2M resource-based architecture
- To emphasize the role of Internet protocol (IP) in M2M
- To provide guidelines for designing security strategies and solutions for M2M

Course Outcomes:

- Formulate the three different business models that are seen in wide-area wireless M2M deployments.
- Analyze the M2M requirements relating to services and network evolution
- Provide the foundation standards for a horizontal M2M service platform
- Realize the significance of Internet protocol (IP) in M2M systems
- Exploit various security policies needed in M2M systems to guard against potential threats

UNIT I  INTRODUCTION TO M2M


UNIT II  M2M REQUIREMENTS AND USE-CASE APPROACHES

M2M requirements and high level architectural principles: Introduction –
ETSI M2M work on use cases - Smart metering, eHealth approaches in ETSI M2M – Description of M2M market segments/applications – High level architecture principles for M2M communications

**UNIT III  ETSI M2M SERVICES ARCHITECTURE**


**UNIT IV  ROLE OF IP IN M2M**


**UNIT V  SECURITY**

M2M security characteristics of cellular M2M – security requirements – Types of solutions – M2M module categorization – Hardware interfaces – Services – Software interface – Case study: M2M communication technologies and challenges - Smart cards in M2M Communication

**TOTAL: 45 Periods**

**TEXTBOOKS:**


**REFERENCE BOOKS:**


2. Rodger Nkumbwa, “MacHine-to-MacHine Communication

WEB REFERENCES:
1. http://test.m2mcomm.com/about/what-is-m2m/index.html
2. http://www.globem2m.com/tutorial/communications-options-in-m2m.html

13IT910: CYBER FORENSICS
(Common to CSE / IT) 3 0 0 3

Course Objectives:
- To familiarize the fundamentals of Cyber forensics systems and Technologies
- To illustrate the importance of Data recovery and Evidence
- To understand the procedure for evidence analysis
- To plan and prepare for an incident requiring computer forensic skills
- To Seize a computer from a crime scene

Course Outcomes:
- Determine what data to analyze in Computer forensics investigation
- Recover data and capture evidence
- Analyze the evidences collected from various sources
- Select suitable Computer forensics tool to analyze forensic data
- Acquire data from Cell phones and mobile devices and investigate mails

UNIT I COMPUTER FORENSICS
(FUNDAMENTALS, TECHNOLOGY, SYSTEMS)
Computer Forensics - Law Enforcement - Assistance to Human


UNIT II COMPUTER FORENSICS EVIDENCE AND CAPTURE


The Chain of Custody - Computer Evidence processing steps - Special needs of evidential authentication

UNIT III COMPUTER FORENSICS ANALYSIS

Determining what data to collect and analyze - Validating forensic data - Addressing data – hiding techniques - Performing remote acquisitions


UNIT IV COMPUTER FORENSIC TOOLS

Evaluating computer forensic tool needs - Types - Tasks - Comparison - computer forensic software tools - Command line - Unix - GUI Forensics tools - computer forensic hardware tools - Forensic workstation - Write - Blocker - validating and testing forensics software - NIST Tools - Validation protocols
UNIT V E–MAIL INVESTIGATIONS

Role of E-mail in investigation - Roles of the client and server in E-mail - Investigating E-mail crimes - E-mail servers - Specialized E-mail forensic tools. Cell phone and mobile device forensics: Understanding mobile device forensics - Understanding acquisition procedures for cell phones and mobile devices.

TOTAL: 45 Periods

TEXTBOOKS:

REFERENCE BOOKS:

WEB REFERENCES:
5. http://www.brandeisdl.discom.com/Forensics/02Modules/07/01Overview/
Course Objectives:

- To explore the fundamental concepts of Natural Language Processing.
- To study the mathematical model for NLP.
- To develop skills that will enable them to understand word processing.
- To understand the process of developing different parsing methods.
- To understand the concepts of different semantics and apply.

Course Outcomes:

- Familiarize with concept of Natural Language Processing.
- Form a mathematical model for NLP.
- Work with word processing techniques.
- Perform different parsing techniques.
- Apply NLP in text processing.

UNIT I  INTRODUCTION TO NLP  9

UNIT II  MATHEMATICAL FOUNDATION  9
UNIT III  WORD PROCESSING  9

UNIT IV  GRAMMAR  9

UNIT V  APPLICATION AND TECHNIQUES  9

TOTAL: 45 Periods

TEXTBOOKS:

REFERENCE BOOKS
WEB REFERENCES:
1. https://www.coursera.org/course/nlp

ELECTIVE III (Electives for VIII Semester)
13CS912: DATA WAREHOUSING AND DATA MINING

Course Objectives:
- To study the concepts of data warehousing architecture and tools
- To understand data mining principles and techniques
- To learn to use association rule mining for handling large data
- To study classification and clustering for better organization and retrieval of data
- To understand business applications and recent trends of Data mining

Course Outcomes:
- Identify the components of data warehousing architecture
- Implement data preprocessing for mining applications
- Apply the association rules for mining the data
- Design and deploy appropriate classification and clustering techniques
- Use recent trends of Data mining in business applications

UNIT I INTRODUCTION TO DATA WAREHOUSING
Data warehousing - Operational database systems vs. Data warehouses - Multidimensional data model - Schemas for multidimensional
UNIT II DATA MINING & DATA PREPROCESSING 8+3
Introduction to KDD process - Knowledge discovery from databases - Need for data pre processing - Data cleaning - Data integration and transformation - Data reduction - Data discretization and concept hierarchy generation.

UNIT III ASSOCIATION RULE MINING 9+3
Introduction - Data mining functionalities - Association rule mining - Mining frequent itemsets with and without candidate generation - Mining various kinds of association rules – Constraint based association mining.

UNIT IV CLASSIFICATION AND CLUSTERING 10+3

UNIT V APPLICATIONS AND RECENT TRENDS OF DATA MINING 9+3
Graph mining - Social network analysis - Multi relational data mining - Mining complex data objects - Spatial databases - Multimedia databases - Text mining - Mining the World Wide Web – Working with WEKA Tool

L : 45 ; P : 15 ; TOTAL: 60 Periods

TEXTBOOKS:
REFERENCE BOOKS:

WEB REFERENCES:
1. www.nptel.ac.in

13CS913: SOFTWARE QUALITY AND TESTING

Course Objectives:
- To learn the basics and goals of software testing
- To discuss various types of software testing techniques
- To list out the tools which can be used for automating the testing process
- To introduce the software quality standards for establishing quality environment
- To understand the methods and evaluation procedures for improving the quality models

Course Outcomes:
- Choose the right type of software testing process for any given real world problem
• Carry out the software testing process in efficient way
• Automate the testing process by using several testing tools
• Use software quality standards for developing quality software
• Analyze and improve the quality procedures based on the past experience

UNIT I  INTRODUCTION  9+3

UNIT II  SOFTWARE TESTING METHODOLOGY  9+3
Software test plan – Components of plan - Types of technical reviews - Static and dynamic testing- – Software testing in spiral manner - Information gathering - Test planning - Test case design - Test development - Test coverage - Test evaluation prepare for next spiral - Conduct system test - Acceptance test - Summarize testing results

UNIT III  EMERGING SPECIALIZED AREAS IN TESTING  9+3

UNIT IV  SOFTWARE QUALITY MODELS  9+3
UNIT V QUALITY THROUGH CONTINUOUS IMPROVEMENT PROCESS

Role of statistical methods in software quality – Transforming requirements into test cases – Requirement quality factors – Numerical method for evaluating requirement quality – Process of creating test cases – Transforming use cases to test cases – Deming’s quality principles – Continuous improvement through Plan Do Check Act (PDCA) - Testing tools – Selenium – Apache JMeter - Quick Test Professional (QTP) – HP LoadRunner – Watir – Lean principles

L : 45 ; P : 15 ; TOTAL: 60 Periods

TEXTBOOKS:

REFERENCE BOOKS:

WEB REFERENCES:
5. http://www.umsl.edu/~sauterv/analysis/488_f01_papers/albright.htm
Course Objectives:

- To understand the basics of digital images
- To learn the spatial domain filters and frequency domain filters
- To study basic image analysis such as edge detection and segmentation
- To learn to use wavelets transforms
- To understand image compression techniques
- To learn to apply image processing and analysis techniques to solve real world problems

Course Outcomes:

- Work with Images on simple operations
- Implement spatial filter operations and frequency domain filters
- Apply edge detection techniques and segmentation algorithms for the images
- Apply wavelet transformation on the given image
- Implement image compression algorithms
- Apply image processing and analysis to solve real world problems

UNIT I FUNDAMENTALS OF IMAGE PROCESSING 9+3
Introduction - Steps in image processing - Image acquisition - Sampling and quantization - Pixel relationships - Color fundamentals and models - File formats - Image operations: Arithmetic, geometric and morphological.

Lab Component: Working with Image operations

UNIT II IMAGE ENHANCEMENT 9+3
Spatial Domain: Gray level transformations - Histogram processing - Noise models – Spatial filtering - Smoothing and sharpening - Spatial
filters for noise removal. Frequency domain: Filtering in frequency domain - DFT, FFT, DCT - Smoothing and sharpening filters - Homomorphic filtering

**Lab Component:** Working with filters

**UNIT III**  
**IMAGE SEGMENTATION AND FEATURE EXTRACTION**  
9+3

Detection of discontinuities - Edge operators - Edge linking and boundary detection - Thresholding - Region based segmentation - Morphological watersheds - Motion segmentation - Feature extraction and analysis

**Lab Component:** Experiment Image Segmentation Algorithms

**UNIT IV**  
**MULTI RESOLUTION ANALYSIS AND COMPRESSION**  
9+3


**Lab Component:** Image Compression using wavelets

**UNIT V**  
**APPLICATIONS OF IMAGE PROCESSING**  
9+3

Image classification - Image recognition - Image understanding - Video motion analysis - Image fusion - Steganography - Digital compositing - Mosaics - Color image processing - Image retrieval - Content based and semantic based retrieval

**Lab Component:** Experiment with applications

*L : 45 ; P : 15 ; TOTAL: 60 Periods*

**TEXTBOOKS:**


REFERENCE BOOKS:

WEB REFERENCES:
2. http://inst.eecs.berkeley.edu/~ee225b/fa12/lectures/
4. www.nptel.ac.in

13CS915: SEMANTIC WEB

Course Objectives:
• To learn the architecture of semantic web
• To understand the implementation of ontology
• To learn the semantic relationships among XML data elements using Resource Description Framework (RDF)
• To study the OWL Web Ontology Language
• To learn semantic web tools and different applications

Course Outcomes:
• Identify the features of syntactic and semantic web
• Implement a small ontology for specific problem domain
• Represent data in XML with appropriate semantic tags
• Build expressive ontologies using OWL
• Work with semantic web tools
UNIT I  INTRODUCTION 9+3

UNIT II  ONTOLOGICAL ENGINEERING 9+3
Ontologies – Taxonomies – Topic maps – Classifying ontologies - Terminological aspects: concepts, terms, relations between them – Complex objects - Subclasses and sub properties definitions – Upper ontologies – Quality – Uses - Methods and methodologies for building ontologies – Ontology development process and life cycle – Methods for ontology learning – Ontology evolution and versioning - Simple web ontology language (OWL) creation

UNIT III  STRUCTURING AND DESCRIBING WEB RESOURCES 9+3

UNIT IV  WEB ONTOLOGY LANGUAGE 9+3

UNIT V  SEMANTIC WEB TOOLS AND APPLICATIONS 9+3

L : 45 ; P : 15 ; TOTAL: 60 Periods
TEXTBOOKS:

REFERENCE BOOKS:

WEB REFERENCES:
3. http://www.w3.org/People/Ivan/CorePresentations/SWTutorial/Slides.pdf
Course Objectives:

- To study the basic concepts of signals and systems.
- To understand discrete time system using frequency transformation.
- To learn to design IIR filter using several mapping techniques.
- To learn to design FIR filter using windowing and frequency sampling techniques.
- To learn to apply DSP techniques in real world problem

Course Outcomes:

- Work with the basic concepts of Signals and Systems
- Apply frequency transformation techniques in DT System
- Design IIR filter using several mapping techniques
- Design FIR filter using window and frequency sampling techniques
- Apply DSP techniques

UNIT I  SIGNALS AND SYSTEMS  10+3

Basic elements of DSP – Concepts of frequency in analog and digital signals – Sampling theorem – Discrete time signals and systems – Analysis of discrete time LTI systems – Z transform – Convolution(Linear and Circular) – Correlation.

UNIT II  FREQUENCY TRANSFORMATIONS  9+3


UNIT III  IIR FILTER DESIGN  9+3

Structures of IIR – Analog filter design – Discrete time IIR filter from analog filter – IIR filter design by impulse invariance - Bilinear transformation - Approximation of derivatives - Filter design (LPF, HPF, BPF, BRF) using frequency translation
UNIT IV  
FIR FILTER DESIGN  
9+3

Structures of FIR – Linear phase FIR filter – Filter design using windowing techniques (Rectangular Window, Hamming Window, and Hanning Window) - Frequency sampling techniques – Finite word length effects in digital Filters: Errors - Limit Cycle.

UNIT V  
APPLICATIONS  
8+3


L : 45 ; P : 15 ; TOTAL: 60 Periods

TEXTBOOKS:


REFERENCE BOOKS:


WEB REFERENCES:

2. www.nptel.ac.in

13IT905: AD HOC AND SENSOR NETWORKS L T P C  3 0 1 4
(Common to CSE / IT)

Course Objectives:

- To study about the fundamentals and different types of Adhoc routing protocols
- To learn about the QoS aware Adhoc routing protocols
- To study about power and energy management in adhoc network
- To understand the basics of Sensor Networks, its architecture and Protocols
- To understand the nature, applications and security issues of sensor networks

Course Outcomes:

- Describe the concept of adhoc and sensor networks, their applications and network architectures
- Analyze various protocol design and issues for adhoc and sensor networks
- Analyze the efficiency of power and energy required for adhoc and sensor network
- Evaluate measurements of protocol performance
- Create an adhoc and sensor network environment for different type of applications
UNIT I ADHOC NETWORK FUNDAMENTALS AND ROUTING 10

UNIT II QUALITY OF SERVICE IN AD HOC NETWORKS 9+6

Lab Component: Performance of Routing Protocols in NS2

UNIT III ENERGY MANAGEMENT IN AD HOC NETWORKS 10

UNIT IV WIRELESS SENSOR NETWORKS 9+6

Lab Component: Performance of Routing Protocols for WSN in NS2

UNIT V ADHOC AND SENSOR NETWORK SECURITY 10

TOTAL: 60 Periods
TEXT BOOKS:


REFERENCE BOOKS:


WEB REFERENCES:


13IT906: FUNDAMENTALS OF BIG DATA
(Common to CSE / IT)

Course Objectives:

- To explore the fundamental concepts of big data analytics
- To analyze the big data using intelligent techniques
- To understand the various search methods and visualization techniques
- To use various techniques for mining data stream
- To understand the applications using Map Reduce Concepts
Course Outcomes:

- Work with big data platform
- Analyze the big data analytic techniques for useful business applications
- Design efficient algorithms for mining the data from large volumes
- Analyze the HADOOP and Map Reduce technologies associated with big data analytics
- Explore on Big Data applications Using Pig and Hive

UNIT I INTRODUCTION TO BIG DATA 9
Introduction to big data platform – Drivers for big data – Big data analytics application-Architecture components - MPP platforms – Unstructured data analytics and reporting – Big data and single view of customer/product – Data privacy protection – Real time adaptive analytics and decision engine – Advanced analytics platform.

UNIT II WORKING WITH HADOOP 9+6
History of Hadoop - HDFS – Components of Hadoop – Developing map reduce application - Setting up a Hadoop cluster - Cluster specification - Cluster setup and installation – Hadoop configuration - Security in Hadoop - Administering Hadoop – Hadoop in the cloud

Lab Component: Working with Hadoop

UNIT III DATA ANALYSIS TECHNIQUES 9

UNIT IV MINING DATA STREAMS 9
UNIT V FRAMEWORKS  

Applications on big data using Pig and Hive – Data processing operators in Pig – Hive services – HiveQL – Querying data in Hive - Fundamentals of HBase and ZooKeeper - BigInsights and streams – NOSQL

Lab Component: Working with Pig, HIVE, NOSQL

L: 30; P: 15, TOTAL: 60 Periods

TEXTBOOKS:


REFERENCE BOOKS:

WEB REFERENCES:

7. http://pig.apache.org/docs/r0.7.0/tutorial.html