# I & II SEMESTERS CURRICULUM AND SYLLABI

## SEMESTER - I

<table>
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<tr>
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## SEMESTER II

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AIM:
To help students specialising in the field of Engineering and Technology develop their proficiency in oral and written communication in Technical English.

OBJECTIVES:
- To enable students improve their vocabulary and employ the words appropriately in different academic and professional contexts.
- To make students comprehend classroom lectures and technically oriented passages.
- To enable students develop suitable reading strategies that could be adopted while reading science related texts.
- To enable students acquire the ability to speak effectively in English in real life situations and work-related situations.
- To train students in academic and professional writing.

UNIT I
9+3
Vocabulary - using words in context - use of suffixes to form nouns from verbs and adjectives – adjectives, adverbs - matching words with meanings - Active and passive voices – tenses - simple present, present continuous - comparative adjectives – adverbial forms - Reading text: skimming for general information - specific details - note making - cloze reading – Listening and transferring of information from text to graphic forms - bar charts, flow-charts - Paragraph writing - descriptions using descriptive words and phrases - organising information - Role play - conversational techniques – discussions - oral reporting.

UNIT II
9+3
Vocabulary items - words with prefixes (“multi-“, “under-“) - Asking and answering questions, error correction - spelling and punctuation - Reading Comprehension - scanning for information – inferring meaning from context - Listening and guided note-taking - paragraph writing - using notes – giving suitable headings / subheadings for paragraphs – Comparing and contrasting using expressions of comparison - Discussion using creative ideas

UNIT III
9+3
Compound nouns - negative prefixes – antonyms – Use of modal verbs – making sentences using phrases – tenses – simple past and present perfect - Reading and guessing meanings in context - Listening and note taking - Channel conversion from text to chart - Writing comparisons - making recommendations - coherence using discourse markers - Discussion - role-play (explaining and convincing)

UNIT IV
9+3
Expanding nominal compounds – words with multiple meanings – Error correction - prepositions - use of the prefix “trans-“ - compound adjectives - modal verbs to express probability - simple past and present prefect - Reading – prediction of content - understanding advertisements - scanning the text and comprehension check - Listening for details - Writing definitions – expression of use and purpose - Role-play – discussion - speculating about the future
UNIT V  
Formation of nouns, verbs and adjectives from root words – some useful phrases and expressions - cloze exercises - ‘if’ conditional clauses – gerunds (verbal nouns) - Reading for comprehension - intensive reading - Accuracy in listening – listening to discussion on specific issues - Group discussion - role-play (stating, discussing problems and proposing solutions) - Planning a tour - Writing an itinerary - Writing formal letters - letter to the editor

LECTURE – 45  TUTORIAL – 15  TOTAL – 60 PERIODS

TEXTBOOKS


REFERENCES

3. Website: www.uefap.co.uk

MA 9111  
MATHEMATICS – I  
(Common to all branches of B.E. / B.Tech. Programmes)  3   1   0   4

AIM:  
To make available the basic concepts of engineering mathematics, to prepare the student for new concepts to be introduced in the subsequent semesters and to provide the necessary mathematical skills that are needed in modeling physical processes by an engineer.

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 which 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
UNIT I MATRICES

UNIT II INFINITE SERIES

UNIT III FUNCTIONS OF SEVERAL VARIABLES

UNIT IV IMPROPER INTEGRALS

UNIT V MULTIPLE INTEGRALS

L: 45, T: 15, TOTAL : 60 PERIODS

TEXT BOOKS

REFERENCES
OBJECTIVE:
To introduce the basic physics concepts relevant to different branches of Engineering and Technology

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) - crystal systems - crystal planes and directions – 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

TEXT BOOKS:
REFERENCES:

AIM:
To gain a sound knowledge of thermodynamics, phase rule, surface chemistry and catalysis, basic organic reaction mechanisms and principles and applications of spectroscopy and nanochemistry.

OBJECTIVES:
To make the student conversant with the
- Applications of second law of thermodynamics.
- Phase rule and various types of alloys
- Surface chemistry and its importance in adsorption and catalysis.
- Basic principles in organic reaction mechanisms and principles and applications of spectroscopy
- Nanochemistry and its applications

UNIT I THERMODYNAMICS

UNIT II PHASE RULE

UNIT III SURFACE CHEMISTRY AND CATALYSIS

UNIT IV ORGANIC REACTIONS AND SPECTROSCOPY

UNIT V NANOCHEMISTRY

TOTAL : 45 PERIODS

TEXT BOOKS:

REFERENCES

GE 9111 ENGINEERING GRAPHICS
(Common to All branches of B.E. / B.Tech. Programmes) 2 0 3 4

OBJECTIVES:
To develop in students the graphic skills that would enable them to communicate the concepts, ideas and design of engineering products
To provide an exposure to the national/international standards related to technical drawings

INTRODUCTION
Importance of graphics in engineering applications – use of drafting instruments – BIS specifications and conventions – size, layout and folding of drawing sheets – lettering and dimensioning
UNIT I  FREE HAND SKETCHING OF ENGG OBJECTS AND CONSTRUCTION OF PLANE CURVE 3+9=12

Pictorial representation of engineering objects – representation of three dimensional objects in two dimensional media – need for multiple views – developing visualization skills through free hand sketching of three dimensional objects.

Polygons & curves used in engineering practice– methods of construction– construction of ellipse, parabola and hyperbola by eccentricity method – Cycloidal and involute curves- construction - drawing of tangents to the above curves.

UNIT II  ORTHOGRAPHIC PROJECTION: PROJECTION OF POINTS, LINES AND PLANE SURFACES 6+9=15

General principles of orthographic projection – first angle projection – layout of views – projections of points, straight lines located in the first quadrant – determination of true lengths of lines and their inclinations to the planes of projection – traces – projection of polygonal surfaces and circular lamina inclined to both the planes of projection

UNIT-III ORTHOGRAPHIC PROJECTION: PROJECTION OF SOLIDS AND SECTIONS OF SOLIDS 6+9=15

Projection of simple solids like prism, pyramid, cylinder and cone when the axis is inclined to one plane of projection –change of position & auxiliary projection methods- sectioning of above solids in simple vertical positions by cutting plane inclined to one reference plane and perpendicular to the other and above solids in inclined position with cutting planes parallel to one reference plane – true shapes of sections

UNIT IV  DEVELOPMENT OF SURFACES AND INTERSECTION OF SOLIDS 6+9=15

Need for development of surfaces – development of lateral surfaces of simple and truncated solids – prisms, pyramids, cylinders and cones – development of lateral surfaces of the above solids with square and circular cutouts perpendicular to their axes. Intersection of solids and curves of intersection –prism with cylinder, cylinder & cylinder, cone & cylinder with normal intersection of axes and with no offset.

UNIT V  ISOMETRIC AND PERSPECTIVE PROJECTIONS 4+9=13

Principles of isometric projection – isometric scale – isometric projections of simple solids, truncated prisms, pyramids, cylinders and cones – principles of perspective projections – projection of prisms, pyramids and cylinders by visual ray and vanishing point methods.

COMPUTER AIDED DRAFTING (DEMONSTRATION ONLY) 3

Introduction to computer aided drafting software packages and demonstration of their use.

L=30  P=45 TOTAL: 75 PERIODS

TEXT BOOKS

REFERENCES


Codes from Bureau of Indian Standards

2. IS 9609 (Parts 0 & 1 )-2001: Technical Products Documentation – Lettering
4. IS 11669-1986 & SP 46-2003: Dimensioning of Technical Drawings
   IS 15021(Parts 1 to 4)-2001: Technical Drawings-Projection Methods

Special points applicable to University Examinations on Engineering Graphics:

1. There will be five questions one from each unit covering all units of the syllabus
2. All questions will carry equal marks of 20 each making a total of 100
3. Answer paper shall consist of drawing sheets of A3 size only. The students will be permitted to use appropriate scale to fit solutions within A3 size
4. The examination will be conducted in appropriate sessions on the same day

GE 9112   FUNDAMENTALS OF COMPUTING       L   T   P   C
          (Common to all branches of B.E. / B.Tech. Programmes)  3   0   0   3

AIM:
To introduce the basics of computing and the fundamentals of C programming.

OBJECTIVES:

- To introduce the fundamentals of computing systems.
- To introduce the concepts of internet and WWW.
- To teach programming in C.

UNIT I
9

UNIT II
9
UNIT III

UNIT IV

UNIT V
Pointers – Dynamic memory allocation – linked list - Applications

TOTAL: 45 PERIODS

TEXT BOOKS

REFERENCES

PH 9112  PHYSICS LABORATORY   L   T   P   C
(Common to ALL Branches of B.E. / B.Tech. Programmes)  0   0   2   1

1. Torsional Pendulum- Determination of rigidity modulus of wire and moment of inertia of disc.
2. Non-uniform bending - Determination of Young's modulus.
3. Lees' disc- Determination of thermal conductivity of a bad conductor.
4. Potentiometer - Determination of thermo e.m.f of thermocouple
5. Air wedge- Determination of thickness of a thin sheet of paper.
6. i. Optical fibre - Determination of Numerical Aperture and acceptance angle
   ii. Compact disc - Determination of width of the groove using laser.
7. Acoustic grating - Determination of velocity of ultrasonic waves in liquids.
8. Post office box - Determination of Band gap
9. Spectrometer - Determination of wavelength using grating
10. Viscosity of liquid- Determination of co-efficient of viscosity of a liquid by Poiseuille’s flow.

TOTAL: 30 PERIODS
I. WEIGHING AND PREPARATION OF STANDARD SOLUTIONS
   i) Preparation of molar and normal solutions of the following substances oxalic acid, sodium carbonate, sodium hydroxide, and hydrochloric acid.
   ii) Preparation of buffer solutions: borate buffer, phosphate buffer using Henderson equation.

2. WATER ANALYSIS
   i) Determination of total hardness, temporary & permanent hardness of water by EDTA method.
   ii) Determination of DO content by Winkler’s method.
   iii) Determination of alkalinity in a water sample.
   iv) Determination of chloride content of water sample by argentometric method.

3. PH-METRY
   To find out the strength of given hydrochloric acid by sodium hydroxide.

4. CONDUCTOMETRY
   i) Conductometric titration of mixture of acids
   ii) Conductometric precipitation titration using BaCl$_2$- Na$_2$SO$_4$

5. POTENTIOMETRY
   i) Redox titration – Iron Vs. dichromate

6. SPECTROPHOTOMETRY
   i) To determine $\lambda$ max of a colored solution such as potassium permanganate.
   ii) To determine the iron content of an unknown solution (1,10- phenanthroline/thiocyanate method)

7. FLAME PHOTOMETRY
   i) To determine sodium and potassium in water.

8. VISCOMETRY
   i) Determination of molecular weight of a polymer

9. WATER POLLUTION
   i) COD analysis of a waste water by dichromate method.

10. KINETICS
    i) Determination of reaction rate constant of acid catalyzed hydrolysis of ester.

11. ADSORPTION
    i) Adsorption of acetic acid on activated charcoal.

**TOTAL: 30 PERIODS**
REFERENCE BOOKS


GE 9113 ENGINEERING PRACTICES LABORATORY L T P C
(Common to all Branches of B.E. / B.Tech. Programmes) 0 0 3 2

OBJECTIVE
To provide exposure to the students with hands-on experience on various basic engineering practices in Civil, Mechanical, Electrical and Electronics Engineering.

GROUP – A (CIVIL & ELECTRICAL)

1. CIVIL ENGINEERING PRACTICE 12

   Plumbing

   Basic pipe connections involving the fittings like valves, taps, coupling, unions, reducers, elbows and other components used in household fittings. Preparation of plumbing line sketches.

   Laying pipe connection to the suction side of a pump – inlet.

   Laying pipe connection to the delivery side of a pump – outlet.

   Practice in mixed pipe connections: Metal, plastic and flexible pipes used in household appliances.

   Wood Work

   Sawing, planning and making common joints: T-Joint, Mortise and Tennon joint, Dovetail joint.

   Study

   Study of joints in door panels, wooden furniture

   Study of common industrial trusses using models.

2. ELECTRICAL ENGINEERING PRACTICE 9

   Basic household wiring using switches, fuse, indicator – lamp etc.,
Preparation of wiring diagrams
Stair case light wiring
Tube – light wiring
Study of iron-box, fan with regulator, emergency lamp

GROUP – B (MECHANICAL AND ELECTRONICS) 15

3. MECHANICAL ENGINEERING PRACTICE

Welding
Arc welding of butt joints, lap joints, tee joints
Gas welding Practice.

Basic Machining
Simple turning, drilling and tapping operations.
Machine assembly Practice.
Study and assembling the following:
Centrifugal pump, mixies and air conditioners.
Demonstration on
(a) Smithy operations like the production of hexagonal bolt.
(b) Foundry operation like mould preparation for grooved pulley.

4. ELECTRONIC ENGINEERING PRACTICE 9

Soldering simple electronic circuits and checking continuity.
Assembling electronic components on a small PCB and testing.
Study of Telephone, FM radio, low-voltage power supplies.

TOTAL: 45 PERIODS
AIM:
The aim is to teach the use of computer applications related to office automation and to teach implementation of C programs.

OBJECTIVES:

- To introduce office automation software packages.
- To teach the fundamentals in C programming.

1. Simple OS commands and simple editors for file operations.
2. Word processors for more complex operations, like formatting documents, creating tables and so on.
3. Simple database packages for creating and manipulating databases.
4. Spread sheet packages for data preparation and analysis.
5. Preparation of reports involving mathematical functions (Income Tax Statement, Mark sheets, Payroll etc.,)
6. C Programs using one dimensional arrays.
7. C Programs using multi-dimensional arrays and pointer data types.
8. Programs using structures, nested structures and union.
10. Programs for passing aggregate data types as parameters between functions.
11. Programs for dynamic memory allocation / deallocation.
12. Programs for self-referential structure – Implementing linked list.

TOTAL: 45 PERIODS
AIM:

To help students specialising in the field of Engineering and Technology develop their proficiency in oral and written communication in Technical English.

OBJECTIVES:

- To enable students develop their critical thinking skills.
- To enable students develop higher order reading skills such as interpreting, evaluating and analysing.
- To enable students develop their active listening skills.
- To enable students participate successfully in Group Discussions.

UNIT I


UNIT II


UNIT III


UNIT IV

UNIT V

Identifying problems, their causes and finding solutions using case studies – creative and critical thinking – levels of thinking – thinking strategies – brainstorming - analytical reasoning skills – evaluative essay – decision making – conflict resolution

English Language Lab (30 Periods)

1. Listening: (10)

Recognising English sounds – accents - listening & answering questions - gap filling - listening & note making - listening to telephonic conversations - listening to speeches.

2. Speaking: (10)

Pronouncing words & sentences correctly - word stress - conversation practice.

3. Reading: (5)

Cloze test - Reading and answering questions - sequencing of sentences.

4. Writing: (5)

Correction of errors - Blogging.

TOTAL : 60 PERIODS

TEXTBOOK


REFERENCES

4. Website: www.englishclub.com

LAB REQUIREMENTS

1. Teacher – Console and systems for students
2. English Language Lab Software
3. Tape Recorders
AIM:
To introduce the effective mathematical tools needed for solving engineering problems and to emphasize the underlying mathematical principles in specific situations confronting practicing engineers.

OBJECTIVES:

- To make the student acquire sound knowledge of techniques in solving ordinary differential equations that model engineering problems
- To acquaint the student with the concepts of vector calculus, needed for problems in all engineering disciplines
- To develop an understanding of 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 appreciate the purpose of using transforms to create a new domain in which it is easier to handle the problem that is being investigated

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.

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 $w = z + c, \frac{1}{z}, z^2$ - 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.

**L: 45, T: 15, TOTAL : 60 PERIODS**

**TEXT BOOKS**

**REFERENCES**

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**PH9168 PHYSICS FOR COMMUNICATION ENGINEERING**
*(Common to Electronics and Communication Engg., Computer Science and Engg. and Information Technology)*

**OBJECTIVE:**
To introduce the essential principles of physics for communication and related engineering applications.

**UNIT I ELECTRICAL PROPERTIES OF METALS**

**UNIT II SEMICONDUCTORS**
UNIT III  DISPLAY DEVICES  9
Photoluminescence, cathodoluminescence, electroluminescence, injection luminescence – plasma displays - LED construction and working – organic LEDs – principles of quantum well laser – liquid crystals and LCD construction and working – numeric displays

UNIT IV  MAGNETIC/OPTICAL DATA STORAGE TECHNIQUES  9

UNIT V  FABRICATION PROCESS USING SEMICONDUCTORS AND DIELECTRIC  9

TOTAL : 45 PERIODS

TEXT BOOKS

REFERENCES

GE 9151  ENGINEERING MECHANICS  L T P C
(Common to Civil, Geoinformatics and Agriculture & Irrigation Engineering) 3 1 0 4

OBJECTIVE:
At the end of this course the student should be able to understand the vectorial and scalar representation of forces and moments, static equilibrium of particles and rigid bodies both in two dimensions and also in three dimensions. Further, the student should understand the principle of work and energy. The student should be able to comprehend the effect of friction on equilibrium. The student should be able to understand the laws of motion, the kinematics of motion and the interrelationship. The student should also be
able to write the dynamic equilibrium equation. All these should be achieved both conceptually and through solved examples.

UNIT I BASICS & STATICS 12

UNIT II EQUILIBRIUM OF RIGID BODIES 12
Free body diagram – Types of supports and their reactions – requirements of stable equilibrium – Moments and Couples – Moment of a force about a point and about an axis – Vectorial representation of moments and couples – Scalar components of a moment – Varignon’s theorem - Equilibrium of Rigid bodies in two dimensions – Equilibrium of Rigid bodies in three dimensions – Examples

UNIT III PROPERTIES OF SURFACES AND SOLIDS 12

UNIT IV DYNAMICS OF PARTICLES 12

UNIT V CONTACT FRICTION AND ELEMENTS OF RIGID BODY DYNAMICS 12

L: 45+T=15 TOTAL : 60 PERIODS

TEXT BOOK

REFERENCES
CS 9151 PROGRAMMING AND DATA STRUCTURES I

L T P C 3 0 0 3

AIM:
The aim is to review the basics of C programming and to introduce the concepts of Data Structures.

OBJECTIVES:

- To introduce the basics of C programming language.
- To introduce the concepts of ADTs.
- To introduce the concepts of Hashing and Sorting.

UNIT I

UNIT II

UNIT III
Lists, Stacks, and Queues: Abstract Data Types (ADTs) – List ADT – Stack ADT – Queue ADT

UNIT IV

UNIT V
Sorting: Insertion Sort – Shell Sort – Heap Sort – Merge Sort – Quick Sort – External Sorting

TOTAL: 45 PERIODS

TEXT BOOKS
REFERENCES

CS 9152 DIGITAL PRINCIPLES AND SYSTEM DESIGN L T P C
3 1 0 4

AIM:
To provide an understanding of the fundamentals of digital logic and digital circuit design

OBJECTIVES:
- To understand Boolean algebra, Boolean functions and realization of functions with basic gates.
- To design combinational and sequential circuits.
- To design circuits with MSI devices.
- To learn the use of HDL for designing larger systems.

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 hdl.

UNIT III DESIGN WITH MSI DEVICES 9
Decoders and Encoders – Multiplexers and Demultiplexers -Memory - Programmable Logic – HDL for Combinational Circuits.

UNIT IV SYNCHRONOUS SEQUENTIAL LOGIC 10

UNIT V ASYNCHRONOUS SEQUENTIAL LOGIC 9
Analysis and design of asynchronous sequential circuits – reduction of state and flow tables – race free state assignment – hazards.

L: 45 + T: 15 TOTAL : 60 PERIODS
TEXT BOOK

REFERENCES

CS 9153  PROGRAMMING AND DATA STRUCTURES LABORATORY I  L T P C
0 0 3 2
1. Programs for Control Structures, Arrays, and Functions.
2. Programs using pointers.
3. Programs using structures.
4. Programs using file IO and preprocessing.
5. Array implementation of List Abstract Data Type (ADT)
6. Linked list implementation and cursor implementation of List ADT
7. Stack ADT – Array and linked list implementations
8. Implement any Stack application using an appropriate header file for the Stack ADT, a separate source file for the array implementation of the Stack ADT, and a separate source file for the application. Use the linked list implementation instead of the array implementation, keeping the other files the same.
9. Implement source files for other applications of the Stack ADT and use the array and linked list implementations interchangeably.
10. Implement the Queue ADT in different ways and use it for different applications.
11. Search ADT using different implementations including Sorted Link List, Binary Search Tree hashing, and different applications.
12. Sorting

TOTAL: 45 PERIODS

CS 9154  DIGITAL SYSTEMS LABORATORY  L T P C
0 0 3 2

AIM:
To Provide hands on experience in designing, building and testing digital circuits

OBJECTIVES:
- To construct digital circuits using standards ICs and testing boards
- To study pin details, and internal logic of standards ICs and testing ICs.
- To implement and verify combinational circuits.
- To implement and verify sequential circuits like shift registers and counters.
- To design simple digital system using the above concepts.
1. Verification of Boolean Theorems using basic gates.

2. Design and implementation of combinational circuits using basic gates for arbitrary functions, code converters.

3. Design and implementation of combinational circuits using MSI devices.
   - 4-bit binary adder/subtractor
   - Parity generator/checker
   - Magnitude Comparator
   - Application using multiplexers

4. Design and implementation of sequential circuits.
   - Shift-registers
   - Synchronous and asynchronous counters

5. Coding combinational/sequential circuits using HDL

6. Design and implementation of a simple digital system.
   (Such as * Sequential adder
   * Binary multiplier
   * Data Transmission
   * Ping – Pong game etc.)

   TOTAL: 45 PERIODS
# UNIVERSITY DEPARTMENTS
# ANNA UNIVERSITY CHENNAI :: CHENNAI 600 025
# REGULATIONS – 2008
# CURRICULUM FROM III TO VIII SEMESTERS FOR
# B.E. COMPUTER SCIENCE AND ENGINEERING

## SEMESTER III

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**TOTAL CREDITS:** 24 + 27 + 136 = 187
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AIM:
To facilitate the understanding of the principles and to cultivate the art of formulating physical problems in the language of mathematics.

OBJECTIVES:
- To introduce Fourier series analysis which is central to many applications in engineering apart from its use in solving boundary value problems
- To acquaint the student with Fourier transform techniques used in wide variety of situations in which the functions used are not periodic
- To introduce the effective mathematical tools for the solutions of partial differential equations that model physical processes
- To develop Z-transform techniques which will perform the same task for discrete time systems

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

UNIT II  FOURIER TRANSFORM  9+3

UNIT III  PARTIAL DIFFERENTIAL EQUATIONS  9+3
Formation – Solutions of first order equations – Standard types and Equations reducible to standard types – Singular solutions – Lagrange’s Linear equation – Integral surface passing through a given curve – Solution of linear equations of higher order with constant coefficients.

UNIT IV  APPLICATIONS OF PARTIAL DIFFERENTIAL EQUATIONS  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 V  Z – TRANSFORM AND DIFFERENCE EQUATIONS  9+3

L: 45, T: 15, TOTAL = 60 PERIODS

TEXT BOOK:

REFERENCES:
AIM:
The aim of this is to introduce the concept of Circuit theory, Electronic Devices and their applications.

UNIT II CIRCUIT ANALYSIS TECHNIQUES 9
Linearity and Superposition, Sources Transformation, Thevinin and Norton Equivalent Circuits, Maximum Power Transfer, Delta-Wye Conversion, Single Phase and 3 Phase Circuits-Power Factor-Power-Concept of Phasor Diagrams.

UNIT III SEMICONDUCTOR DEVICES 9

UNIT IV RECTIFIER, AMPLIFIER AND OSCILLATOR 9
FWR-Filter-Capacitors Input Filter-Choke Input Filter – CE Amplification with and without feedback – Analysis and Frequency Response – CS MOSFET Amplifier - Analysis

UNIT V OPERATION AMPLIFIER 9

TOTAL: 45 PERIODS

TEXT BOOKS:

REFERENCES:

AIM:
The aim is to introduce the basics of algorithm design paradigms and analysis to enable designing of efficient algorithms.

OBJECTIVES:
- To introduce the basic concepts of algorithm analysis
- To introduce the design paradigms for algorithm design
- To introduce the basic complexity theory.
UNIT I  PRELIMINARIES  

UNIT II  DESIGN TECHNIQUE I  

UNIT III  DESIGN TECHNIQUE II  

UNIT IV  APPLICATIONS  

UNIT V  NP PROBLEMS  

TOTAL: 45 PERIODS

TEXT BOOK:  

REFERENCES:  
OBJECTIVES:
- To learn the fundamentals of data models and to conceptualize and depict a database system using ER diagram.
- To make a study of SQL and relational database design.
- To understand the internal storage structures using different file and indexing techniques which will help in physical DB design.
- To know the fundamental concepts of transaction processing- concurrency control techniques and recovery procedure.
- To have an introductory knowledge about the Storage and Query processing techniques

UNIT I INTRODUCTION

UNIT II RELATIONAL MODEL

UNIT III DATABASE DESIGN

UNIT IV TRANSACTIONS

UNIT V IMPLEMENTATION TECHNIQUES

TOTAL: 45 PERIODS

TEXT BOOKS:
REFERENCES:

CS 9203 PROGRAMMING AND DATA STRUCTURES II  L T P C
3 0 0 3

AIM:
The aim is to introduce the concept of Object Oriented Programming and analyse the implementation of Advanced Data Structures using Object Oriented Programming Language.

OBJECTIVES:
- To introduce the concepts of Object Oriented Programming language.
- To introduce the concepts of Templates and Error Handling.
- To introduce the concepts of Advanced Data Structures.

UNIT I  OOP CONCEPTS  9

UNIT II  INHERITANCE  9

UNIT III  TEMPLATES AND EXCEPTIONS  9

UNIT IV  DATA STRUCTURES  9
OO Perspective of List, Stack, Queue, and Search Tree ADTs – AVL Trees – Red Black Trees – Splay Trees – B-trees – Priority Queues (Heaps)
UNIT V     SET AND GRAPHS
Disjoint Set ADT – Graph Algorithms – Topological Sort – Shortest-Path Algorithm – Network Flow Problems – Minimum Spanning Tree – Applications of Depth-First Search

TOTAL: 45 PERIODS

TEXT BOOKS:

REFERENCES:

CS 9204     COMPUTER ARCHITECTURE     L T P C
3 1 0 4

AIM:
To understand the organization of a computer, and the hardware-software interface.

OBJECTIVES:
- To know about the various components of a computer and their internals.
- To comprehend the importance of the hardware-software interface, and instruction-set architecture.
- To understand the architectural features of superscalar processors.

UNIT I     BASIC STRUCTURE OF COMPUTERS  9+3

UNIT II     BASIC PROCESSING UNIT  6+3

UNIT III     PIPELINING AND ILP  12+3
UNIT IV  MEMORY SYSTEM

UNIT V I/O ORGANIZATION

TEXT BOOKS:

REFERENCES:

CS 9205 DATABASE MANAGEMENT SYSTEMS LABORATORY

AIM:
The aim of this laboratory is to inculcate the abilities of applying the principles of database management systems. The course aims to prepare the students for projects where a proper implementation of databases will be required.

OBJECTIVES:
- The students will be able to create a database file
- The students will be able to query a database file
- The students will be able to append and update a database file

EXPERIMENTS IN THE FOLLOWING TOPICS:
1. Data Definition, Manipulation of base tables and views
2. High level programming language extensions.
3. Front end tools
4. Forms
5. Triggers
6. Menu Design
7. Importing/ Exporting Data.
8. Reports.
9. Database Design and implementation (Mini Project).

TOTAL: 45 PERIODS
AIM:
To implement different data structures and their algorithms for storing, accessing and manipulating data using an object oriented programming language.

OBJECTIVES:
- To implement the concepts of object oriented programming.
- To implement different data structures using object oriented programming language.
- To use standard template library in the implementation of standard data structures.

EXPERIMENTS IN THE FOLLOWING:
1. Implementation of any one of the following List, Stack, Queue ADTs, binary search trees.
2. Implement data abstraction by separate compilation of implementation (.h & .cpp) and application (main.cpp).
3. Use of standard Template Library: Strings, containers.
5. Operator Overloading.
6. Templates.
7. Exception handling, Class Hierarchies.
8. AVL Tree.
9. Splay Tree.
11. Graph algorithms.

TOTAL: 45 PERIODS
AIM:
To understand the running time of algorithms.

OBJECTIVES:
- To understand the need for analyzing algorithms.
- To understand that algorithms execution speed cannot be expressed as a fixed time quantity.
- To know the ways of estimating time speed for different algorithms
- To study about applications of the different algorithms.
- To know about the various tools available for analyzing algorithms.

IMPLEMENT THE FOLLOWING
1. Simple recursive programs like Towers of Hanoi, Generating Permutations.
2. Sort algorithms.
3. Randomized quick sort algorithm.
7. Simplex Method.
8. String matching algorithms.

TOTAL: 45 PERIODS

EE 9262 ELECTRICAL ENGINEERING & CONTROL SYSTEMS

AIM:
To provide knowledge in the basic concepts of circuits, electrical machines, linear control theory and its analysis.

OBJECTIVES:
- To impart knowledge on Network theorems.
- Principle of electrical machines.
- Different system representation, block diagram reduction and Mason’s rule.
- Time response analysis of LTI systems and steady state error.
- State variable analysis.
UNIT I ELECTRIC CIRCUITS 9

UNIT II ELECTRICAL MACHINES AND TRANSFORMERS 9

UNIT III MATHEMATICAL MODELS OF PHYSICAL SYSTEMS 9

UNIT IV TRANSFER FUNCTION ANALYSIS 9
Frequency response – Bode plots –Time Response analysis of II order system – Time and frequency domain specifications.

UNIT V STATE VARIABLE ANALYSIS 9
Concept of state variable – State models for linear & continuous time systems – State variable realizations - Solution of state equation.

TOTAL: 45 PERIODS

TEXT BOOKS:

REFERENCES:
AIM:
- To have an in depth knowledge of the architecture and programming of 8-bit and 16-bit Microprocessors, Microcontrollers and to study how to interface various peripheral devices with them.

OBJECTIVES:
- To study the basic architectures and operational features of the processors and controllers
- To learn the assembly language programming
- To design and understand the multiprocessor configurations
- To understand the interfacing concepts of the peripheral devices with that of the processors

UNIT I  THE 8085 AND 8086 MICROPROCESSORS  9
8085 Microprocessor architecture – Instruction set – Programming the 8085 - 8086 Microprocessor architecture – signals.

UNIT II  8086 SOFTWARE ASPECTS  9

UNIT III  SYSTEM DESIGN  9
Basic configurations – Minimum and maximum modes – System design using 8086 – Multiprocessor configurations – Introduction to 80286, 80386 and Pentium.

UNIT IV  I/O INTERFACING  9

UNIT V  MICROCONTROLLERS  9

TOTAL: 45 PERIODS

TEXT BOOKS:
REFERENCES:

CS 9252 OPERATING SYSTEMS L T P C
3 0 0 3

AIM:
The course introduces the students to the basic principles of operating systems.

OBJECTIVES:
- To be aware of the evolution of operating systems
- To learn what processes are, how processes communicate, how process synchronization is done and how to manage processes
- To have an understanding of the main memory and secondary memory management techniques.
- To understand the I/O Subsystem
- To have an exposure to Linux and Windows 2000 operating systems

UNIT I OPERATING SYSTEMS OVERVIEW

UNIT II PROCESS MANAGEMENT
UNIT III  STORAGE MANAGEMENT  9
Memory Management – Swapping – Contiguous memory allocation – Paging –
Segmentation – Segmentation with paging. Virtual Memory: Background – Demand

UNIT IV  I/O SYSTEMS  9
File concept – Access methods – Directory structure – File-system mounting –
Protection – Directory implementation – Allocation methods – Free-space management

UNIT V  CASE STUDY  8
The Linux System – History – Design Principles – Kernel Modules – Process
Management – Scheduling – Memory management – File systems – Input and Output –
Networking.

TOTAL: 45 PERIODS

TEXT BOOK:

REFERENCES:
   2004.

CS 9253  WEB TECHNOLOGY  3L 0T 0P 3C

AIM:
To provide an introduction to Java and basic Web concepts and enable the student to
create simple Web based applications.

OBJECTIVES:
To introduce the features of object oriented programming languages using Java
▪ To design and create user interfaces using Java frames and applets
▪ To have a basic idea about network programming using Java
▪ To create simple Web pages and provide client side validation
▪ To create dynamic web pages using server side scripting

UNIT I  BASICS OF JAVA  9
Java fundamentals – Class, Object – Inheritance – Polymorphism – Packages –
Interfaces – Exception handling
UNIT II  JAVA IO AND NETWORKING  9
I/O – AWT – Event handling – Introduction to Threads - Basics of Networking –TCP and UDP sockets – Connecting to the Web

UNIT III  DATABASE AND DISTRIBUTED APPLICATIONS  9
Applets – JDBC – Swings – Remote Method Invocation

UNIT IV  HTML AND CLIENT-SIDE SCRIPTS  9

UNIT V  SERVER SIDE SCRIPTS  9
Server side scripting – JSP – Servlets – Session management – Cookies

TOTAL: 45 PERIODS

TEXT BOOKS:

REFERENCES:

MA 9265  DISCRETE MATHEMATICS  L T P C
AIM:
To extend student’s Logical and Mathematical maturity and ability to deal with abstraction and to introduce most of the basic terminologies used in computer science courses and application of ideas to solve practical problems.

OBJECTIVES:
At the end of the course, students would
- Have knowledge of the concepts needed to test the logic of a program.
- Have an understanding in identifying structures on many levels.
- Be aware of a class of functions which transform a finite set into another finite set which relates to input output functions in computer science.
- Be aware of the counting principles.
- Be exposed to concepts and properties of algebraic structures such as semi groups, monoids and groups.
UNIT I  LOGIC AND PROOFS  

UNIT II  COMBINATORICS  

UNIT III  GRAPHS  
Graphs and graph models – Graph terminology and special types of graphs - presenting graphs and graph isomorphism – connectivity – Euler and Hamilton paths.

UNIT IV  ALGEBRAIC STRUCTURES  
Algebraic systems – Semi groups and monoids – Groups-Subgroups and homomorphisms – Cosets and Lagrange's theorem – Ring & Fields.

UNIT V  LATTICES AND BOOLEAN ALGEBRA  

L: 45, T: 15, TOTAL = 60 PERIODS

TEXT BOOKS:

REFERENCES

CS 9254  SOFTWARE ENGINEERING  
3 0 0 3

AIM:
The course is intended to give Software Engineering principles in classical sense.

OBJECTIVES:
- To be aware of generic models to structure the software development process.
- To understand fundamental concepts of requirements engineering and requirements specification.
- To understand different notion of complexity at both the module and system level.
- To be aware of some widely known design methods.
- To understand the role and contents of testing activities in different life cycle phases.
UNIT I  SOFTWARE PROCESS MODELS  9

UNIT II  REQUIREMENTS ENGINEERING  9

UNIT III  MODELLING  9

UNIT IV  SOFTWARE DESIGN  9

UNIT V  SOFTWARE MEASUREMENT  9

TOTAL: 45 PERIODS

TEXT BOOKS:

REFERENCES:

CS 9255  MICROPROCESSORS LABORATORY  L T P C
0 0 3 2

AIM:
To learn the assembly language programming of 8085, 8086 and 8051 and also to give a practical training of interfacing the peripheral devices with the processor.

OBJECTIVES:
- To implement the assembly language programming in 8085, 8086 and 8051
- To study the system function calls like BIOS/DOS.
- To experiment the interface concepts of various peripheral device with the processor
EXPERIMENTS IN THE FOLLOWING:

3. Interfacing with 8085/8086-8255, 8253.
4. Interfacing with 8085/8086-8279, 8251.
5. 8051 Micro controller based experiments – assembly language programs.
6. 8051 Micro controller based experiments – control applications.
7. Mini – Project.

TOTAL: 45 PERIODS

CS 9256 WEB TECHNOLOGY LABORATORY L T P C
0 0 3 2

AIM:
To enable the students to program in Java and to create simple Web based applications.

OBJECTIVES:
- To write simple programs using Java.
- To design and create user interfaces using Java frames and applets.
- To write I/O and network related programs using Java.
- To create simple Web pages and provide client side validation.
- To create dynamic web pages using server side scripting.

EXPERIMENTS IN THE FOLLOWING:

1. Java Fundamentals, Classes, Objects.
2. Inheritance, Polymorphism.
3. Interfaces, Exception handling.
4. I/O, AWT.
5. Socket Programming.
6. Applets, Swings.
7. Database connectivity.
8. RMI.
9. XML, Style sheet, Parser.
10. Client side scripting.
11. JSP, Servlets.
12. Session Management.

TOTAL: 45 PERIODS
AIM:
To have hands-on experience in operating system concepts and programming in the UNIX environment.

OBJECTIVES:
- To learn shell programming and the use of filters in the UNIX environment.
- To learn to program in C using system calls.
- To learn to use the file system related system calls.
- To have a knowledge in how processes are created and processes communicate.
- To learn how process synchronization is done using semaphores.

EXPERIMENTS IN THE FOLLOWING:
1. Basic UNIX commands.
2. Shell Programming.
3. Grep, sed, awk.
4. File system related system calls.
7. Pipes, FIFOs.
8. Signals.
9. Shared memory.
10. Semaphores.

TOTAL: 45 Periods

CS 9301 OBJECT ORIENTED ANALYSIS AND DESIGN

AIM:
To study object oriented analysis and design and the techniques needed to apply them.

OBJECTIVES:
- To study the concepts of modelling in object oriented context.
- To learn about the Object Constraint Language.
- To study and learn how to apply analysis techniques and methodologies including Use cases, System Sequence Diagrams.
- To study and learn how to apply design techniques and methodologies including Interaction Diagrams, Class Diagrams.
- To study implementation related issues.
- To study and learn how to apply advanced techniques including Architectural Analysis and Design Patterns.

UNIT I INTRODUCTION
Introduction – Modelling as a design technique – UML diagrams - Class modeling – Object Constraint Language – State modeling – Interaction Modeling
UNIT II  OVERVIEW OF USECASES  9

UNIT III  MODELING AS DESIGN TECHNIQUE  10

UNIT IV  MAPPING  8
Mapping designs to code – Test Driven development and refactoring – UML Tools and UML as blueprint

UNIT V  PATTERNS  10
More Patterns – Analysis update – Objects with responsibilities – Applying design patterns – Architectural Analysis – Logical Architecture Refinement – Package Design – Persistence framework with patterns

TOTAL: 45 PERIODS

TEXTBOOKS:
1. Michael Blaha and James Rumbaugh, “Object-oriented modeling and design with UML”, Prentice-Hall of India, 2005. (Unit 1)

REFERENCES:

CS 9302  THEORY OF COMPUTATION  L T P C  3 0 0 3

AIM:
To have foundation on automata languages and grammar.

OBJECTIVES:
- Develop the concepts and skills necessary to be able to evaluate the compatibility and undecidability.

UNIT I  AUTOMATA  9

UNIT II  REGULAR EXPRESSIONS AND LANGUAGES  9
Regular Expression – FA and Regular Expressions – Proving languages not to be regular – Closure properties of regular languages – Equivalence and minimization of Automata.
UNIT III  CONTEXT-FREE GRAMMARS AND LANGUAGES  9
Context-Free Grammar (CFG) – Parse Trees – Ambiguity in grammars and languages –
Definition of the Pushdown automata – Languages of a Pushdown Automata –
Equivalence of Pushdown automata and CFG– Deterministic Pushdown Automata.

UNIT IV  PROPERTIES OF CONTEXT-FREE LANGUAGES  9
Normal forms for CFG – Pumping Lemma for CFL – Closure Properties of CFL – Turing
Machines – Programming Techniques for TM.

UNIT V  UNDECIDABILITY  9
A language that is not Recursively Enumerable (RE) – An undecidable problem that is
RE – Undecidable problems about Turing Machine – Post’s Correspondence Problem –
The classes P and NP.

TOTAL: 45 PERIODS

TEXT BOOK
1. J.E. Hopcroft, R. Motwani and J.D. Ullman, “Introduction to Automata Theory,

REFERENCES:
1997.

CS 9303  SYSTEM SOFTWARE INTERNALS  LT P C
3 0 0 3

AIM
To study the internal structures and methodologies used in System Software

OBJECTIVES
- To study the design and implementation issues in implementing assemblers.
- To study the role of linkers and loaders and the interaction with hardware.
- To study how macroprocessors work, and a brief introduction to compilers.
- To study various issues in the design of Virtual Machines
- To study the techniques used in other system software contexts such as emulators,
  process virtual machines, profiling, migration and grids.

UNIT I  ASSEMBLERS  9
Review of Computer Architecture – Machine Instructions and Programs – Assemblers –
Basic Assembler Functions – Assembler Features – Assembler Design Options

UNIT II  LOADERS AND LINKERS  10
Loaders and Linkers – Basic Loader Functions – Machine-Dependent Loader Features –
Machine-Independent Loader Features – Loader Design Options – Architectural Issues
Loading and Overlays – Shared Libraries – Dynamic Linking and Loading – Advanced
Techniques
UNIT III  MACROPROCESSORS AND COMPILERS  
Macros – Basic Macro Processor Functions – Machine-Independent Macro Processor Features – Macro Processor Design Options – Basic Compiler Functions – Grammars – Lexical Analysis – Syntactic Analysis – Code Generation

UNIT IV  VIRTUAL MACHINES  

UNIT V  PROCESS VIRTUAL MACHINES  

TOTAL: 45 PERIODS

TEXT BOOKS:

REFERENCES:

CS 9304  ARTIFICIAL INTELLIGENCE  
L T P C  3 0 0 3

AIM:
The aim of this course is to provide an introduction to some basic issues and algorithms in artificial intelligence (AI). The course also provides an overview of Intelligent agent design, where agents perceive their environment and act rationally to fulfill their goals. The course approaches AI from an algorithmic, computer science-centric perspective.

OBJECTIVES:
- To be familiar with the history of AI, philosophical debates, and be able to discuss the potential and limitations of the subject in its current form.
- To identify the kind of problems that can be solved using AI technique: to know the relation between AI and other areas of computer science.
- To have knowledge of generic problem-solving methods in AI.
- To understand the basic techniques of knowledge representation and their use.
- To know what the basic components of an intelligent agent are, and how this relates to other advanced subjects such as information retrieval, database systems, computer vision, robotics, human-computer interaction, reactive systems etc.
- To be able to implement basic decision making algorithms, including search-based problem solving techniques, and first-order logic.
To know the basic issues in machine learning, and be able to apply straightforward techniques to learn from observed data.
To be able to explain the difficulty of computer perception with examples from different modalities, and be able to show how perception affects intelligent systems design.

UNIT I  INTRODUCTION

UNIT II  SEARCHING TECHNIQUES

UNIT III  KNOWLEDGE REPRESENTATION AND REASONING

UNIT IV  LEARNING

UNIT V  APPLICATIONS

TOTAL: 45 PERIODS

TEXT BOOK:

REFERENCES:
AIM:
To understand the concepts of data communication and computer networks

OBJECTIVES:
- To grasp the principles of data communication.
- To understand the layering concepts in computer networks.
- To understand the functions of each layer.
- To have knowledge in different applications that use computer networks.

UNIT I  PHYSICAL LAYER  11 + 3
Data transmission – Transmission media – Signal encoding techniques – Multiplexing – Spread spectrum

UNIT II  DATA LINK LAYER  11 + 3

UNIT III  NETWORKING LAYER  9 + 3

UNIT IV  TRANSPORT LAYER  7 + 3

UNIT V  APPLICATIONS  7 + 3
Email (SMTP, MIME, POP3, IMAP) – HTTP – DNS- SNMP – Telnet – FTP

L: 45, T: 15, TOTAL = 60 PERIODS

TEXT BOOKS:

REFERENCES:
AIM:
To have hands-on experience in network programming and to use simulation tools to analyse network protocols.

OBJECTIVES:
- To learn socket programming.
- To use simulation tools.
- To analyse the performance of protocols in different layers in computer networks using simulation tools.

EXPERIMENTS IN THE FOLLOWING
1. Applications using TCP Sockets like
   a. Echo client and echo server.
   b. File transfer.
   c. Remote command execution.
   d. Chat.
   e. Concurrent server.
2. Applications using UDP Sockets like
   a. DNS.
   b. SNMP.
3. Applications using Raw Sockets like
   a. Ping.
   b. Traceroute.
4. RPC
5. Experiments using simulators like OPNET:
   b. Performance comparison of Routing protocols.

Study of TCP/UDP performance.

TOTAL: 45 PERIODS

AIM:
Scope of this lab is to understand the application of case tools, which focuses on the software engineering activities.

OBJECTIVES:
- Software requirements analysis and specification
- Software design
- Software implementation
- Software testing and maintenance
- Communication skills and teamwork
- Modeling techniques and CASE tools
- Software project planning and management
EXPERIMENTS IN THE FOLLOWING TOPICS

1. Study of case tools such as rational rose or equivalent tools.

2. Requirements
Implementation of requirements engineering activities such as elicitation, validation, management using case tools

4. Analysis and design
Implementation of analysis and design using case tools.

5. Study and usage of software project management tools for cost estimation and scheduling


7. Data modeling using automated tools.

8. Practice reverse engineering and reengineering using tools.

9. Exposure towards test plan generators, test case generators, test coverage and software metrics.

10. Meta modeling and software life cycle management.

TOTAL: 45 PERIODS

GE 9371 COMMUNICATION SKILLS AND SOFT SKILLS L T P C
LABORATORY FIFTH / SIXTH SEMESTER 0 0 2 1

AIM
To enhance the overall capability of students and to equip them with the necessary Communication Skills and Soft Skills that would help them excel in their profession.

OBJECTIVES
- To equip students of engineering and technology with effective speaking and listening skills in English.
- To help them develop their soft skills and interpersonal skills, which will make the transition from college to workplace smoother and help them excel in their jobs.
- To enhance the performance of students at Placement Interviews, Group Discussions and other recruitment exercises.

A. Viewing and discussing audio-visual materials (6 periods)

1. Resume / Report Preparation / Letter Writing 2
   Letter writing – Job application with Resume - Project report - Email etiquette.

2. Presentation skills 1
   Elements of effective presentation – Structure of presentation - Presentation tools – Body language.

3. Soft Skills
   Time management – Stress management – Assertiveness – Negotiation strategies.
4. **Group Discussion**  
Group discussion as part of selection process, Structure of group discussion – Strategies in group discussion – Mock group discussions.

5. **Interview Skills**  
Kinds of interviews – Interview techniques – Corporate culture – Mock interviews. (Career Lab Software may be used for this section).

**Note:** Career Lab software may be used to learn the skills, to be applied in the practice session.

**B. PRACTICE SESSION**  
(24 periods)

1. **Resume / Report Preparation / Letter writing:** Students prepare their own resume and report.

2. **Presentation Skills:** Students make presentations on given topics.

3. **Group Discussion:** Students participate in group discussions.

4. **Interview Skills:** Students participate in Mock Interviews

**TOTAL : 30 PERIODS**

**REFERENCES**


**MA 9266 PROBABILITY AND QUEUEING THEORY**  
L T P C  
3 1 0 4

**AIM**

To provide the required mathematical support in real life problems and develop probabilistic models which can be used in several areas of science and engineering.

**OBJECTIVES**

- The students will have a fundamental knowledge of the probability concepts.
- Acquire skills in analyzing queueing models.
- It also helps to understand and characterize phenomenon which evolve with respect to time in a probabilistic manner.
UNIT I  RANDOM VARIABLES  9 + 3
Discrete and Continuous random variables – Moments – Moment generating functions –
Binomial, Poisson, Geometric, Uniform, Exponential, Gamma, Weibull and Normal
distributions - Functions of a random variable.

UNIT II  TWO-DIMENSIONAL RANDOM VARIABLES  9 + 3
Joint distributions – Marginal and Conditional distributions – Covariance – Correlation
and Linear regression – Transformation of random variables – Central limit theorem (for
independent and identically distributed random variables).

UNIT III  RANDOM PROCESSES  9 + 3
Classification – Stationary process –Markov process - Poisson process – Discrete
parameter Markov chain – Chapman Kolmogorov equations –Limiting distributions.

UNIT IV  QUEUEING THEORY  9 + 3
Markovian queues – Birth and Death processes – Single and multiple server queueing
models – Little’s formula - Queues with finite waiting rooms – Finite source models.

UNIT V  NON-MARKOVIAN QUEUES AND QUEUEING NETWORKS  9 + 3
M/G/1 queue – Pollaczek Khinchin formula - M/D/1 and M/E_k/1 as special cases –
Series queues – Open and closed Jackson networks.

L: 45, T: 15, TOTAL = 60 PERIODS

TEXT BOOKS:
1. Ibe, O.C. “Fundamentals of Applied Probability and Random Processes”, Elsevier,

REFERENCES
1. Allen, A.O., “Probability, Statistics and Queueing Theory with Computer
3. Trivedi, K.S., “Probability and Statistics with Reliability, Queueing and Computer

CS 9351  DIGITAL SIGNAL PROCESSING  L T P C
3 0 0 3

AIM:
To give an understanding on the study that deals with the representation of signals as
ordered sequences of numbers and how to process those ordered sequences.

OBJECTIVES:
• To understand the basics of signals and system by analyzing the various
  transformations available and determine their use to DSP
• To study on the various digital filtering techniques and how to apply to DSP
• To study on the ways to estimate signal parameters, and transform a signal into a
  form that is more informative.
• To give students a flavour on the applications of DSP in the areas of speech and
  image
UNIT I SIGNALS AND SYSTEMS

UNIT II FREQUENCY TRANSFORMATIONS

UNIT III IIR FILTER DESIGN
Structures of IIR – Analog filter design – Discrete time IIR filter from analog filter – IIR filter design by Impulse Invariance, Bilinear transformation, Approximation of derivatives – (LPF, HPF, BPF, BRF) filter design using frequency translation

UNIT IV FIR FILTER DESIGN
Structures of FIR – Linear phase FIR filter – Filter design using windowing techniques, Frequency sampling techniques – Finite word length effects in digital Filters

UNIT V APPLICATIONS

TOTAL: 45 PERIODS

TEXT BOOKS:

REFERENCES:

CS 9352 MOBILE AND PERVASIVE COMPUTING

AIM:
To introduce the students to the current challenges and insight regarding the way how mobile computing is evolving towards the world of pervasive computing.

OBJECTIVES:
- Understand and identify requirements issue limitation parameters and components in computing
- Using such a knowledge, understand the rationale for the solution adopted in existing or emerging systems
- Able to participate in the development and proposal of future systems.
UNIT I  MOBILE NETWORKS

UNIT II  WIRELESS NETWORKS
Wireless LANs and PANs – IEEE 802.11 Standard – Architecture – Services – Network – HiperLAN – Blue Tooth- Wi-Fi – WiMAX

UNIT III  ROUTING

UNIT IV  TRANSPORT AND APPLICATION LAYERS

UNIT V  PERVERSIVE COMPUTING
Pervasive computing infrastructure-applications- Device Technology - Hardware, Human-machine Interfaces, Biometrics, and Operating systems– Device Connectivity – Protocols, Security, and Device Management- Pervasive Web Application architecture- Access from PCs and PDAs - Access via WAP

TOTAL: 45 PERIODS

TEXT BOOKS:

REFERENCES:

CS 9353  PRINCIPLES OF COMPILER DESIGN  L T P C
3 0 0 3

AIM:
To understand the design and implementation of a simple compiler.

OBJECTIVES:
- To understand the functions of the various phases of a compiler
- To learn the overview of the design of lexical analyzer and parser
- To study the design of the other phases in detail.
- To learn the use of compiler construction tools.

UNIT I  BASICS OF COMPILATION
UNIT II TYPE CHECKING AND RUNTIME ENVIRONMENTS

UNIT III INTERMEDIATE CODE GENERATION
Intermediate languages – Declarations – Assignment statements – Boolean expressions – Case statements – Backpatching – Procedure calls.

UNIT IV CODE GENERATION

UNIT V CODE OPTIMIZATION

TOTAL: 45 PERIODS

TEXT BOOK:

REFERENCES

GE 9261 ENVIRONMENTAL SCIENCE AND ENGINEER LT P C
(Common to all branches) 3003

AIM:
To create awareness in every engineering graduate about the importance of environment, the effect of technology on the environment and ecological balance and make them sensitive to the environment problems in every professional endeavour that they participate.

OBJECTIVE:
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 organization in environment managements.
UNIT I  ENVIRONMENT, ECOSYSTEMS AND BIODIVERSITY
Definition, scope and importance of environment – need for public awareness - concept of an ecosystem – structure and function of an ecosystem – producers, consumers and decomposers – energy flow in the ecosystem – ecological succession – food chains, food webs and ecological pyramids – Introduction, types, characteristic features, structure and function of the (a) forest ecosystem (b) grassland ecosystem (c) desert ecosystem (d) aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries) – Introduction to biodiversity definition: genetic, species and ecosystem diversity – biogeographical classification of India – value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values – Biodiversity at global, national and local levels – India as a mega-diversity nation – hot-spots of biodiversity – threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts – endangered and endemic species of India – conservation of biodiversity: In-situ and ex-situ conservation of biodiversity.
Field study of common plants, insects, birds
Field study of simple ecosystems – pond, river, hill slopes, etc.

UNIT II  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 – soil waste management: causes, effects and control measures of municipal solid wastes – role of an individual in prevention of pollution – pollution case studies – disaster management: floods, earthquake, cyclone and landslides.
Field study of local polluted site – Urban / Rural / Industrial / Agricultural.

UNIT III  NATURAL RESOURCES
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.
Field study of local area to document environmental assets – river / forest / grassland / hill / mountain.

UNIT IV  SOCIAL ISSUES AND THE ENVIRONMENT

UNIT V  HUMAN POPULATION AND THE ENVIRONMENT

TOTAL: 45 PERIODS
TEXT BOOKS:

REFERENCES:

CS 9354 COMPILER LABORATORY

L T P C
0 0 3 2

AIM:
The student will be able to design and implement a compiler using the tools at the end of the semester.

OBJECTIVES:
- To implement a lexical analyzer, syntax analyzer using tools.
- To implement a code generator and the necessity for code optimization.
- To know about compiler simulation tools.

USE COMPILER GENERATOR TOOLS TO IMPLEMENT THE FOLLOWING.

1. Scanner
2. Parser
3. Type checker
4. Intermediate code generator
   a. Assignment statements
   b. Expressions with subscripted variables
   c. Boolean expressions
   d. Control structures

Use any high level language to do the following.
5. Flow graph construction from intermediate code
6. Code generation for the given machine specification

TOTAL: 45 PERIODS
CS 9355      MOBILE AND PERVASIVE COMPUTING LABORATORY  L T P C  0 0 3 2

AIM:
The course aims at providing a sound conceptual knowledge in area of mobile and pervasive computing.

OBJECTIVES:
- To provide the students with the competencies required to simulate and understand the mobile wireless network.
- Teach the students to analyse and design web applications.

EXPERIMENTS IN THE FOLLOWING
1. Simulation of applications using J2ME simulator
2. Simulation of applications to access web sites using Microsoft Windows Mobile .net environment
3. Implementation of playing games and photo sharing applications using BREW (Binary Runtime Environment for Wireless Toolkit)
4. Simulation of Infotainment (news, weather forecasts etc) using WAP, WML Scripts
5. Pervasive devices connectivity – Using of server side programming in Java
   i. Write web application from PCs using smart card authentication
   ii. Write web application via WAP phones
   iii. Write web application from PDAs

TOTAL: 45 PERIODS

CS 9356      FREE AND OPEN SOURCE SOFTWARE LABORATORY  L T P C  0 0 3 2

AIM:
The student will get exposure to operating system and networking concepts at source code level.

OBJECTIVES:
- To learn the setting up of GNU/Linux-based servers and workstation
- To learn shell programming
- To learn to configure application and server software
- To learn to perform system administration tasks
- To learn to use free and open source components.

EXPERIMENTS IN THE FOLLOWING
1. GNU/Linux OS installation (provide details of how to detect hardware, configure disk partitions & filesystems and successfully install a GNU/Linux distribution).
2. Basic shell commands - logging in, listing files, editing files, copying/moving files, viewing file contents, changing file modes and permissions, process management.
3. User and group management, file ownerships and permissions, PAM authentication, Introduction to common system configuration files & log files.
4. Configuring networking, basics of TCP/IP networking and routing, connecting to the Internet (through dialup, DSL, ethernet, leased line).
5. Configuring additional hardware - sound cards, displays & display cards, network cards, modems, usb drives, CD writers.

6. Performing every day tasks using GNU/Linux - accessing the Internet, playing music, editing documents and spreadsheets, sending and receiving email, copy files from disks and over the network, playing games, writing CDs.

7. Setting up email servers - using postfix (for SMTP services), courier (for IMAP & POP3 services), squirrelmail (for webmail services).

8. Setting up web servers - using Apache (for HTTP services), Setting up proxy services, printer services, firewall.

9. Using the GNU Compiler Collection - getting acquainted with the the GNU compiler tools - the C preprocessor (cpp), the C compiler (gcc) and the C++ compiler (g++), and the assembler (gas).

10. Understanding build systems - constructing makefiles and using make, using autoconf and autogen to automatically generate makefiles tailored for different development environments, Using flex (lex) and bison (yacc) to design parsers.

TOTAL: 45 PERIODS

CS 9401  GRAPHICS AND MULTIMEDIA  L T P C  3 1 0 4

AIM:
• Introduce students to various two and three dimensional primitives and concepts
• Provide an opportunity for students to represent, design and implement two dimensional and three dimensional objects
• Introduce students to the different media used in multimedia systems.
• Introduce students to the design issues related to multimedia systems.

OBJECTIVES:
• Explain two and three dimensional concepts and their applications
• Identify all techniques related to modern graphics programming concepts
• Identify the media used in multimedia systems and to assess their relative advantages and disadvantages relative to both user and system points of view.
• Explain the interaction problems introduced by multimedia (e.g., compression and synchronization)

UNIT I  2D 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  3D 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  12
Color Models – RGB, YIQ, CMY, HSV – Animations – General Computer Animation,
Raster, Keyframe - Graphics programming using OPENGL – Basic graphics primitives –
Drawing three dimensional objects.

UNIT IV  MULTIMEDIA BASICS  12
Introduction and definitions – applications - elements - Compression – Types of
compressions - Lossless, Lossy – Video compression – Image Compression – Audio
compression - Data and file format.

UNIT V  MULTIMEDIA SYSTEMS  12
Multimedia Authoring Systems – Hypermedia Design considerations – User Interface
Design – Object Display and Play back issues- Hypermedia Messaging- Distributed
Multimedia Systems – Components – multimedia Object Servers – Managing Distributed
Objects.

L: 45, T: 15, TOTAL = 60 PERIODS

TEXT BOOKS:
edition, Pearson Education,2004

REFERENCES
2. Ralf Steinmetz and Klara, “Multimedia Computing, Communications and

CS 9402  CRYPTOGRAPHY AND SECURITY  L T P C
3 0 0 3

AIM:
To introduce the fundamentals of Cryptography and its application to Security.

OBJECTIVES:
- To understand the mathematics behind Cryptography
- To understand the standard algorithms used to provide confidentiality provide
  integrity and authenticity.
- To get a working knowledge of network security, data base security and DS security
  issues in order to build secure systems.

UNIT I  MATHEMATICAL FUNDAMENTALS  9
Security trends – Attacks and services – Classical crypto systems – Different types of
ciphers – LFSR sequences – Basic Number theory – Congruences – Chinese
Remainder theorem – Modular exponentiation – Fermat and Euler's theorem – Legendre
and Jacobi symbols – Finite fields – continued fractions.

UNIT II  ENCRYPTION TECHNIQUES  9
Simple DES – Differential cryptoanalysis – DES – Modes of operation – Triple DES –

UNIT III  KEY EXCHANGE AND AUTHENTICATION TECHNIQUES  9
Discrete Logarithms – Computing discrete logarithms – Diffie-Hellman key exchange –
Elliptic curve cryptography Key exchange - ElGamal Public key cryptosystems –
Message Authentication codes - Hash functions – Hash algorithms - Secure Hash –
Birthday attacks - MD5 – Authentication protocols - Digital signatures – RSA, ElGamal,
DSA.
UNIT IV  NETWORK SECURITY PRACTICE  

UNIT V  OPERATING SYSTEMS AND DATABASE SECURITY  

TOTAL: 45 PERIODS

TEXT BOOKS:

REFERENCES:
UNIT IV  DIRECTING  9
Creativity and Innovation - Motivation and Satisfaction - Motivation Theories Leadership - Leadership theories - Communication - Hurdles to effective communication - Organization Culture - Elements and types of culture - Managing cultural diversity.

UNIT V  CONTROLLING  9
Process of controlling - Types of control - Budgetary and non-budgetary control techniques - Managing Productivity - Cost Control - Purchase Control - Maintenance Control - Quality Control - Planning operations.

TOTAL: 45 PERIODS

REFERENCES:

CS 9404  GRAPHICS AND MULTIMEDIA LABORATORY  L T P C
0 0 3 2

AIM:
This course will help students in understanding the implementation of two and three dimensional objects using OPENGL Graphics programming library suite. It also helps students in designing animations, hand lying images and implementing various compression algorithms.

OBJECTIVES:
- Student will be able to construct and manipulate multi dimensional objects.
- Students will be able to handle image files and can also create animations

IMPLEMENT EXPERIMENTS 1-6 USING OPENGL
1. Implementation of Bresenham's Algorithm – Line, Circle, Ellipse.
2. Two Dimensional transformations - Translation, Rotation, Scaling, Reflection, Shear.
3. Composite 2D Transformations
4. Cohen Sutherland 2D clipping and Windowing
5. Three dimensional transformations - Translation, Rotation, Scaling
6. Composite 3D transformations
7. Compression Algorithms - To implement text and image compression algorithms.
8. 2D Animation – To create Interactive animation using any animation software
9. Image Editing and Manipulation - Basic Operations on image using any image editing software, Creating gif animated images, Image optimization

TOTAL: 45 PERIODS
AIM:
The aim of this laboratory is to ensure that students understand and are able to apply the basic principles of software development. The course aims to inculcate the correct practices of software development among the students.

OBJECTIVES:
The following salient points to be included in each system development:
- Identification of Use cases for each application system and SRS preparation.
- Identification of reusable Components/Frameworks from open source and customizing them for each application.
- Coding/Customizing/Wrapping for components/subsystems.
- Testing – Scenario testing and test case preparation for each components/subsystems
- Integration of subsystems and Testing
- Simulation of datasets and load testing to analyze performance of the system.

CHOOSE CURRENT PROBLEMS FROM DOMAINS LIKE
1. Health care
2. Education
3. Banking & Finance
4. Military
5. E-Services
6. Business
7. Scientific Domain
8. Retail

TOTAL: 45 PERIODS

IT 9304 DISTRIBUTED SYSTEMS L T P C
3 0 0 3

AIM:
The aim of the course is to convey an insight into the fundamental concepts, principles, and state-of-the-art practice underlying the design of distributed systems.

OBJECTIVES:
- To understand the importance of communication in distributed environment and the actual implementation of various communication mechanisms
- To study how a distributed operating system works and how it differs from the single processor OS.
- To learn how to manage the resources in a distributed environment
- To learn how to make a distributed systems fault tolerant
- To study how the above-mentioned techniques have been used in actual, real-life distributed systems.

UNIT I COMMUNICATION IN DISTRIBUTED ENVIRONMENT 8
UNIT II DISTRIBUTED OPERATING SYSTEMS

UNIT III DISTRIBUTED RESOURCE MANAGEMENT
Distributed Shared Memory – Data-Centric Consistency Models – Client-Centric Consistency Models – Ivy – Munin – Distributed Scheduling – Distributed File Systems – Sun NFS.

UNIT IV FAULT TOLERANCE AND CONSENSUS

UNIT V CASE STUDIES
Distributed Object-Based System – CORBA – COM+ – Distributed Coordination-Based System – JINI.

TOTAL: 45 PERIODS

TEXT BOOKS:

REFERENCES:

CS 9022 INTERNET PROGRAMMING

AIM:
To provide an overview of 3-tier architecture and enable the student to create enterprise applications.

OBJECTIVES:
- To introduce the feature of the J2EE framework and the usage of MVC architecture.
- To design and create user interfaces using JSP.
- To write the business logic for the middle tier.
- To provide transaction and security support for enterprise applications.
- To study the features of other frameworks.

UNIT I BASIC FEATURES
Introduction – 3 tier architecture – working with model-view-controller – JCP – J2EE XML based APIs – Application servers
UNIT II  WEB APPLICATIONS  

UNIT III  ENTERPRISE JAVA BEANS  
Service Tier and Data tier – EJB architecture – session beans – entity beans – message driven beans – JDBC – J2EE connector architecture

UNIT IV  WEBSERVICES  
Web Services – J2EE Web Services – patterns – presentation, service tier and Data tier patterns – J2ME

UNIT V  ADVANCED CONCEPTS  
AJAX - Struts – JSF – Hibernate – Spring

TOTAL: 45 PERIODS

TEXT BOOKS:

REFERENCES

CS 9023  UNIX INTERNALS  L T P C
3 0 0 3

AIM:
To understand file system, process, memory management and I/O in Unix.

OBJECTIVES:
- To Understand the Interface Between Hardware And Software
- To Understand the Process Subsystem
- To Understand the Memory Subsystem
- To Understand Memory Management
- To Study the I/O Subsystem, Device Drivers And Ipc

UNIT I  OVERVIEW

UNIT II  FILE SUBSYSTEM
UNIT III  SYSTEM CALLS FOR THE FILE SYSTEM
Open – Read – Write – File and record locking – Adjusting the position of file I/O – Lseek
– Close – File creation – Creation of special files – Changing directory, root, owner,
mode – stat and fstat – Pipes – Dup – Mounting and unmounting file systems – link –
unlink.

UNIT IV  PROCESSES
Process states and transitions – Layout of system memory – The context of a process –
Saving the context of a process – Manipulation of the process address space - Sleep.
Process Control: Process creation – Signals – Process termination – Awaiting process
termination – Invoking other programs – user id of a process – Changing the size of a
process - Shell – System boot and the INIT process– Process Scheduling.

UNIT V  MEMORY MANAGEMENT AND I/O
Memory Management Policies: Swapping – Demand paging. The I/O Subsystem:
Driver Interface – Disk Drivers – Terminal Drivers– Streams – Inter process
communication.
TOTAL: 45 PERIODS

TEXT BOOK:

REFERENCES:

CS 9024 ADVANCED DATABASE TECHNOLOGY
AIM:
Advanced database aims at providing an understanding of the principles used in the
design of different kinds of data models. It is also deals with the Transaction
management of these different databases.

OBJECTIVES:
- To understand about different data models that can be used for specialized
  applications
- To make the students to get familiarized with transaction management of advanced
  database models
- To develop in-depth knowledge about web and intelligent database systems.
- To provide an introductory concept about the way in which data can be stored in
  multimedia databases.
UNIT I RELATIONAL MODEL ISSUES

UNIT II DISTRIBUTED DATABASES

UNIT III OBJECT ORIENTED DATABASES

UNIT IV EMERGING SYSTEMS
Enhanced Data Models - Client/Server Model - Data Warehousing and Data Mining - Web Databases – Mobile Databases- XML and Web Databases.

UNIT V CURRENT ISSUES

TOTAL: 45 PERIODS

TEXT BOOK:

REFERENCES:

CS 9025 SOFTWARE REQUIREMENTS MANAGEMENT L T P C
3 0 0 3

AIM:
This course brings out the importance of Software Requirement and management in Software development.

OBJECTIVES:
- To know several dimensions of problem analysis
- To explain important management concepts
- To be aware of different methods of refining systemic definition
- To know about change management and its impact on software development
UNIT I  INTRODUCTION  9

UNIT II  ANALYSING THE PROBLEM  9
The five steps in problem analysis- business modeling – Systems engineering of software intensive systems – Understanding user and stakeholders needs – Features of a product or system –Interviewing – Requirements workshops- Brain storming and Idea reduction- storyboarding

UNIT III  DEFINING THE SYSTEM  9
Use case primer-Organizing requirement Information-Vision Document-Product Management-Managing scope-Establishing Project scope-Managing customer

UNIT IV  REFINING THE SYSTEM DEFINITION  9
Software requirement-Refining the use cases-developing the supplementary specification- Ambiguity and specificity -Technical methods for specifying requirements

UNIT V  BUILDING THE RIGHT SYSTEM  9
From use cases to Implementation-From use Cases to Test cases-Tracing requirements-Managing Change-Assessing Requirements Quality in Iterative Development-Agile Requirement methods.

TOTAL: 45 PERIODS

TEXTBOOK:

REFERENCES:

CS 9026  SOFTWARE DESIGN AND ARCHITECTURE  L T P C
3 0 0 3

AIM:
The aim is to inculcate the abilities to convert the user requirements to design document. The course aims to teach the basics of Software Design and Paradigms and to apply for Real Time Projects.

OBJECTIVES
- To provide a background and conduct of Software Design process
- To provide a comprehensive list of Software Architecture Designs and Plan
- To introduce Software Design representations.
- To introduce functional design and Object Oriented Design.
UNIT I  INTRODUCTION  9
Nature of design process – Characteristics of design activities, Essential elements of design-
Factors affecting design quality - Design Quality models – Design principles – Notion of Software architecture – Simple case studies.

UNIT II  SOFTWARE ARCHITECTURE  9
Description of software Architectures – Architectural design space – Scenario based analysis and evaluation – SAAM and ATAM methods - formalizing the architectural styles – Tools for architectural design.

UNIT III  SOFTWARE DESIGN  9
Describing the detailed design – Design representations – rationale for software design methods- Design process – Simple design Practices – Stepwise refinement, Incremental design.

UNIT IV  STRUCTURED DESIGN  9
Structured system analysis and Structured design – Jackson structured Programming and Development.

UNIT V  OBJECT ORIENTED DESIGN  9
Object concept – Component based development – Formal approach to design – Design patterns- Design Review.

TOTAL: 45 PERIODS

TEXT BOOKS:

CS 9027  DATA WAREHOUSING AND DATA MINING  L T P C
3 0 0 3

AIM:
To serve as an introductory course to undergraduate students with an emphasis on the design aspects of Data Mining and Data Warehousing

OBJECTIVES:
This course has been designed with the following objectives:
- To introduce the concept of data mining with detail coverage of basic tasks, metrics, issues, and implication. Core topics like classification, clustering and association rules are exhaustively dealt with.
- To introduce the concept of data warehousing with special emphasis on architecture and design.

UNIT I  DATA WAREHOUSING  10
UNIT II BUSINESS ANALYSIS

UNIT III DATA MINING

UNIT IV ASSOCIATION RULE MINING AND CLASSIFICATION
Mining Frequent Patterns, Associations and Correlations – Mining Methods – Mining Various Kinds of Association Rules – Correlation Analysis – Constraint Based Association Mining – Classification and Prediction - Basic Concepts - Decision Tree Induction - Bayesian Classification – Rule Based Classification – Classification by Backpropagation – Support Vector Machines – Associative Classification – Lazy Learners – Other Classification Methods – Prediction

UNIT V CLUSTERING AND APPLICATIONS AND TRENDS IN DATA MINING

TOTAL: 45 PERIODS

TEXT BOOKS:

REFERENCES:
AIM:
The aim of the course is to teach the role of middleware in the distributed environment and its common services.

OBJECTIVES:
- To study the set of services that a middleware system constitutes of.
- To understand how middleware facilitates the development of distributed applications in heterogeneous environments.
- To study how it helps to incorporate application portability, distributed application component interoperability and integration
- To learn the object oriented middleware basics through the example of the following CORBA objects.
- To understand the basics of Web services that is the most often used middleware technique.

UNIT I  INTRODUCTION

UNIT II  OBJECT ORIENTED MIDDLEWARE

UNIT III  COMPONENT OBJECT RESOURCE BROKER ARCHITECTURE

UNIT IV  WEB SERVICES

UNIT V  OTHER TYPES OF MIDDLEWARE

TOTAL: 45 PERIODS

TEXT BOOKS:

REFERENCES:
AIM:
To provide an introduction to the .NET framework and enable the student to program in C#.

OBJECTIVES:
- To study basic and advanced features of the C# language
- To create form based and web based applications
- To study the internals of the .NET framework

UNIT I  C# BASICS  9
C# and the .NET framework – C# basics – Objects and types – Inheritance – Arrays – Operators and casts – Indexers

UNIT II  ADVANCED C# FEATURES  9
Delegates and events – Strings and regular expressions – Generics – Collections – Memory management and pointers – Errors and exceptions

UNIT III  I/O AND NETWORK PROGRAMMING  9
Tracing and events - threading and synchronization - .Net security – localization – Manipulating XML - Managing the file system – basic network programming

UNIT IV  WINDOW AND WEB APPLICATIONS  9
Window based applications – Data access with .NET – basics of ASP .NET - Introduction to web services

UNIT V  .NET FEATURES  9
Architecture – Assemblies – shared assemblies – CLR hosting – Appdomains – Reflection

TOTAL: 45 PERIODS

TEXT BOOK:

REFERENCES:
UNIT I  FUNDAMENTALS OF IMAGE PROCESSING  9

UNIT II  IMAGE ENHANCEMENT  9

UNIT III  IMAGE SEGMENTATION AND FEATURE ANALYSIS  9

UNIT IV  MULTI RESOLUTION ANALYSIS AND COMPRESSIONS  9

UNIT V  APPLICATIONS OF IMAGE PROCESSING  9

TOTAL: 45 PERIODS

TEXT BOOK:

REFERENCES:

CS 9031  CYBER FORENSICS  L T P C
AIM:  3 0 0 3
To study different types of Cyber forensic technologies and enable the student to have a foundation in this emerging area.

OBJECTIVES:
- To study the fundamentals of computer forensics
- To have an overview of techniques for Data Recovery and Evidence Collection
- To study various threats associated with security and information warfare
- To study the tools and tactics associated with cyber forensics.
UNIT I  FUNDAMENTALS OF FORENSICS  9
Computer Forensics Fundamentals – Types of Computer Forensics Technology – Types of Vendor and Computer Forensics Services

UNIT II  DATA RECOVERY AND DIGITAL EVIDENCE  9
Data Recovery – Evidence Collection and Data Seizure – Duplication and Preservation of Digital Evidence – Computer Image Verification and Authentication

UNIT III  EVIDENCE COLLECTION TECHNIQUE  9
Discover of Electronic Evidence – Identification of Data – Reconstructing Past Events – Networks

UNIT IV  THREATS AND INFORMATION WALFARE  9
Fighting against Macro Threats – Information Warfare Arsenal – Tactics of the Military – Tactics of Terrorist and Rogues – Tactics of Private Companies

UNIT V  TOOLS AND ADVANCED TECHNIQUES  9
The Future – Arsenal – Surveillance Tools – Victims and Refugees – Advanced Computer Forensics

TOTAL: 45 PERIODS

TEXTBOOK:

REFERENCES:

CS 9032  GRAPH THEORY  L T P C
3 0 0 3

AIM:
To develop Knowledge of basic Graph Theory and use them in problem solving.

OBJECTIVES:
- Acquiring knowledge of the basic concepts in Graph Theory.

UNIT I  INTRODUCTION  9

UNIT II  TREES, CONNECTIVITY, PLANARITY  9
UNIT III  MATRICES, COLORING AND DIRECTED GRAPH  9

UNIT IV  ALGORITHMS- I  9

UNIT V  ALGORITHMS- II  9

TOTAL: 45 PERIODS

TEXT BOOK:

REFERENCE:

CS 9033  ADVANCED COMPUTER ARCHITECTURE  L T P C
3 0 0 3

AIM:
To comprehend the advancements in computer architecture in all aspects – from implicit to explicit parallelism.

OBJECTIVES:
• To understand the principle and various dimensions of instruction-level parallelism, and thread-level parallelism.
• To appreciate the move towards multi-core architectures and realize the challenges in dealing with such architectures.
• To get a feel of programming for such architectures.

UNIT I  INSTRUCTION LEVEL PARALLELISM AND ITS EXPLOITATION  9
ILP – Concepts and challenges – Review of hardware techniques – Compiler techniques for exposing ILP – Static branch prediction – VLIW & EPIC – Advanced compiler support – Hardware support for exposing parallelism – Hardware versus software speculation mechanisms – IA 64 and Itanium processors – Limits on ILP.

UNIT II  MULTIPROCESSORS AND THREAD LEVEL PARALLELISM  9
UNIT III  MEMORY AND I/O  
Cache performance – Reducing cache miss penalty and miss rate – Reducing hit time – 
Main memory and performance – Memory technology. Types of storage devices – 
Buses – RAID – Reliability, availability and dependability – I/O performance measures – 
Designing an I/O system.

UNIT IV  MULTI-CORE ARCHITECTURES  
Software and hardware multithreading – SMT and CMP architectures – Design issues – 
Case studies – Intel Multi-core architecture – SUN CMP architecture

UNIT V  PARALLEL PROGRAMMING AND MULTITHREADED APPLICATION DEVELOPMENT  

TOTAL: 45 PERIODS

TEXT BOOKS:

REFERENCES:

CS 9034  TCP/IP DESIGN AND IMPLEMENTATION  L T P C  3 0 0 3

AIM:
To study about the internetworking concepts and functionalities of TCP and IP software and to design data structures for implementing those functionalities.

OBJECTIVES:
- To understand the IP addressing schemes which provides the base for Layer 2 and Layer 3 header field detection, error reporting and dynamic address mapping.
- To develop data structures for basic protocol functions of TCP/IP and to understand and use the various members in the respective structures.
- To design and implement data structures for maintaining multiple local and global timers that will govern over various modules of TCP and IP software.

UNIT I  INTRODUCTION  
Internetworking concepts and architecture model – classful Internet address – CIDR – 
UNIT II      TCP
Services – header – connection establishment and termination – interactive data flow –
bulk data flow – timeout and retransmission – persist timer – keep alive timer – futures
and performance.

UNIT III     IP IMPLEMENTATION
IP global software organization – routing table – routing algorithms – fragmentation and
reassembly – error processing (ICMP) – Multicast Processing (IGMP).

UNIT IV      TCP IMPLEMENTATION I
Data structure and input processing – transmission control blocks – segment format –
comparison – finite state machine implementation – Output processing – mutual
exclusion – computing the TCP Data length.

UNIT V       TCP IMPLEMENTATION II
Timers – events and messages – timer process – deleting and inserting timer event –
flow control and adaptive retransmission – congestion avoidance and control – urgent
data processing and push function.

TOTAL: 45 PERIODS

TEXT BOOKS:
1. Douglas E Comer,"Internetworking with TCP/IP Principles,Protocols and

REFERENCES:
UNIT II  SYSTEM ADMINISTRATION  10
GNU/Linux OS installation -- detect hardware, configure disk partitions & file systems and install a GNU/Linux distribution; Basic shell commands - logging in, listing files, editing files, copying/moving files, viewing file contents, changing file modes and permissions, process management; User and group management, file ownerships and permissions, PAM authentication; Introduction to common system configuration files & log files; Configuring networking, basics of TCP/IP networking and routing, connecting to the Internet (through dialup, DSL, Ethernet, leased line); Configuring additional hardware - sound cards, displays & display cards, network cards, modems, USB drives, CD writers; Understanding the OS boot up process; Performing every day tasks using gnu/Linux -- accessing the Internet, playing music, editing documents and spreadsheets, sending and receiving email, copy files from disks and over the network, playing games, writing CDs; X Window system configuration and utilities -- configure X windows, detect display devices; Installing software from source code as well as using binary packages

UNIT III  SERVER SETUP AND CONFIGURATION  10
Setting up email servers -- using postfix (SMTP services), courier (IMAP & POP3 services), squirrel mail (web mail services); Setting up web servers -- using apache (HTTP services), php (server-side scripting), perl (CGI support); Setting up file services -- using samba (file and authentication services for windows networks), using NFS (file services for gnu/Linux / Unix networks); Setting up proxy services -- using squid (http / ftp / https proxy services); Setting up printer services - using CUPS (print spooler), foomatic (printer database); Setting up a firewall - Using netfilter and iptables

UNIT IV  PROGRAMMING TOOLS  12
Using the GNU Compiler Collection -- GNU compiler tools; the C preprocessor (cpp), the C compiler (gcc) and the C++ compiler (g++), assembler (gas); Understanding build systems -- constructing make files and using make, using autoconf and autogen to automatically generate make files tailored for different development environments; Using source code versioning and management tools -- using cvs to manage source code revisions, patch & diff; Understanding the GNU Libc libraries and linker - linking against object archives (.a libraries) and dynamic shared object libraries (.so libraries), generating statically linked binaries and libraries, generating dynamically linked libraries; Using the GNU debugging tools -- gdb to debug programs, graphical debuggers like ddd, memory debugging / profiling libraries mpatrol and valgrind; Review of common programming practicies and guidelines for GNU/Linux and FOSS; Introduction to Bash, sed & awk scripting

UNIT V  APPLICATION PROGRAMMING  10
Basics of the X Windows server architecture; Qt Programming; Gtk+ Programming; Python Programming; Programming GUI applications with localisation support.

TOTAL: 45 PERIODS

REFERENCES:

ON-LINE MATERIAL:
AIM:
To give an overall understanding on the theories that are available to solve hard real-world problems

OBJECTIVES:
- To give the students an overall knowledge of soft computing theories and fundamentals
- To give an understanding on the fundamentals of non-traditional technologies and approaches to solving hard real-world problems
- Use of ANN, Fuzzy sets to solve hard real-world problems
- To given an overview of Genetic algorithms and machine learning techniques to solving hard real-world problems
- To study about the applications of these areas

UNIT I INTRODUCTION
Evolution of Computing - Soft Computing Constituents – From Conventional AI to Computational Intelligence – Neural Networks - Scope and Evolution – Models of Neural Networks – Feed forward Networks – Supervised Learning Neural Networks – Associative memory networks – Unsupervised learning networks – Special Networks

UNIT II FUZZY SETS AND FUZZY LOGIC
UNIT III  FUZZY MEASURES AND REASONING  9
Fuzzy arithmetic and measures – Fuzzy reasoning – approximate reasoning –
categorical, qualitative, syllogistic, dispositional – Fuzzy inference systems – fuzzy
decision making – individual, multiperson, multi objective, Bayesian – fuzzy logic control
system – architecture, model and application

UNIT IV  MACHINE LEARNING AND GENETIC ALGORITHM  9
Algorithms (GA) – Simple and General GA – Classification of Genetic Algorithm –
Messy, Adaptive, Hybrid, Parallel – Holland Classifier System

UNIT V  APPLICATION AND IMPLEMENTATION SOFT COMPUTING  9
Genetic algorithms -. Traveling Salesperson Problem, Internet Search Techniques –
Fuzzy Controllers – Bayesian Belief networks for Rocket Engine Control - Neural
Network, Genetic algorithm and Fuzzy logic implementation in C++ and Matlab

TOTAL: 45 PERIODS

TEXT BOOK:
First Indian Edition, 2007

REFERENCES:
1. Jyh-Shing Roger Jang, Chuen-Tsai Sun, Eiji Mizutani, “Neuro-Fuzzy and Soft
2. James A. Freeman and David M. Skapura, “Neural Networks Algorithms,
3. George J. Klir and Bo Yuan, “Fuzzy Sets and Fuzzy Logic-Theory and
2000.

CS 9037  KNOWLEDGE MANAGEMENT  L T P C
3 0 0 3

AIM
This course is intended to provide undergraduate students a perspective on how
Knowledge Management Systems can be built and its underlying technologies

OBJECTIVES
• The students will be exposed to deep knowledge in designing a knowledge
management system.
• Current trends in information technology such as electronic markets, digital library,
E auction, E governance etc can be developed and deployed effectively using
knowledge management issues.
• KM strategies will improve future organizational structures.
UNIT I KNOWLEDGE MANAGEMENT

UNIT II KNOWLEDGE MANAGEMENT SYSTEM LIFE CYCLE

UNIT III CAPTURING KNOWLEDGE

UNIT IV KNOWLEDGE CODIFICATION

UNIT V KNOWLEDGE TRANSFER AND SHARING

TOTAL: 45 PERIODS

TEXT BOOK:

REFERENCES:

CS 9038 DATABASE TUNING LT P C 3 0 0 3

AIM:
To provide a strong foundation in database tuning and Query processing

OBJECTIVES:
- On completion of the course each student trained in this course will develop effective query execution plans, tune the recovery sub system, tune nested queries, procedures and functions, identify where denormalization is required and tune the application interface.
- In addition to the above the student will gain knowledge on tuning in the most popularly used Database Servers Oracle, SQL Server and DB2 UDB. Tuning on distributed database implementation is also part of this course
UNIT I FUNDAMENTALS OF TUNING

UNIT II INDEX TUNING
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

UNIT IV TROUBLESHOOTING

UNIT V CASE STUDIES

TOTAL: 45 PERIODS

TEXT BOOK:

REFERENCES:

CS 9039 GRID COMPUTING

AIM:
To understand the latest advances in the field of computation to optimize the utilization of resources.

OBJECTIVES:
- To enable resource sharing across networks
- To integrate heterogeneous computing systems and data resources with the aim of providing a global computing space
- To manage and schedule the resources in grid environments
- To know the standards and protocols used
- To Know the middleware in grid computing
UNIT I CONCEPTS AND ARCHITECTURE 9
Introduction-Parallel and Distributed Computing-Cluster Computing-Grid Computing-Anatomy and Physiology of Grid-Review of Web Services-OGSA-WSRF.

UNIT II GRID MONITORING 9
Grid Monitoring Architecture (GMA) - An Overview of Grid Monitoring Systems- GridICE – JAMM -MDS-Network Weather Service-R-GMA-Other Monitoring Systems- Ganglia and GridMon

UNIT III GRID SECURITY AND RESOURCE MANAGEMENT 9

UNIT IV DATA MANAGEMENT AND GRID PORTALS 9

UNIT V GRID MIDDLEWARE 9

TOTAL: 45 PERIODS

TEXT BOOK:

REFERENCES:
4. URLs : www.globus.org and glite.web.cern.ch

CS 9040 LANGUAGE TECHNOLOGIES L T P C 3 0 0 3

AIM:
The aim of this course is understand the issues and challenges of tackling natural language and outline some of the techniques and heuristics used in language technologies.

OBJECTIVES:
- To understand the issues and challenges in natural language and the various modules of a typical natural language processing system
- To learn the indexing and searching processes of a typical information retrieval system and to study NLP based retrieval systems
- To gain knowledge about typical text categorization and clustering techniques
- To know about evaluation techniques for information retrieval and text mining
- To comprehend Multimodality and multilingualism issues
- To gain knowledge about translation, dialog agents and Generation systems
UNIT I INTRODUCTION

UNIT II INFORMATION RETRIEVAL

UNIT III TEXT MINING
Categorization – Extraction based Categorization- Clustering- Hierarchical Clustering- Document Classification and routing- finding and organizing answers from Text search – use of categories and clusters for organising retrieval results – Text Categorization and efficient Summarization using Lexical Chains – Pattern Extraction (evaluation).

UNIT IV GENERIC ISSUES

UNIT V APPLICATIONS

TOTAL: 45 PERIODS

TEXT BOOKS:

REFERENCES:
AIM:
This course aims at understanding Information and Scientific visualization techniques and give a clear picture of various abstraction mechanisms.

OBJECTIVES:
- At the end of the course the student will be able to understand basic visualization and interaction techniques in the information visualization fields, as well as basic approaches to visually exploring large databases.
- Students will also understand the various abstraction mechanisms and to create interactive visual interfaces.

UNIT I  FOUNDATIONS FOR DATA VISUALIZATION
Visualization stages – Experimental Semiotics based on Perception Gibson’s Affordance theory – A Model of Perceptual Processing – Types of Data.

UNIT II  COMPUTER VISUALIZATION

UNIT III  MULTIDIMENSIONAL VISUALIZATION

UNIT IV  TEXTUAL METHODS OF ABSTRACTION
From Graphics to Pure Text – Figure Captions in Visual Interfaces – Interactive 3D illustrations with images and text – Related work – Consistency of rendered – images and their textual labels – Architecture – Zoom techniques for illustration purpose – Interactive handling of images and text.

UNIT V  ABSTRACTION IN TIME AND INTERACTIVE SYSTEMS

TOTAL: 45 PERIODS

TEXT BOOKS:

REFERENCES:
AIM:
This course aims at the role of software developers in getting exposure on planning and controlling aspect of software development

OBJECTIVES:
- To understand the roles of the project manager
- To understand the threats and opportunities in project management
- To gain Expertise in size, effort and cost estimation techniques
- To understand the techniques available with which a project's aims and objectives, timetable, activities, resources and risks can be kept under control
- To understand the social and political problems a project will encounter--against which the technical problems pale into insignificance--and to begin to understand how to approach non-technical problems
- To appreciate management issues like team structure, group dynamics

UNIT I  INTRODUCTION TO SOFTWARE PROJECT MANAGEMENT
9

UNIT II  PROJECT EVALUATION
9

UNIT III  ACTIVITY PLANNING
9

UNIT IV  MONITORING AND CONTROL
9

UNIT V  MANAGING PEOPLE AND ORGANIZING TEAMS
9

TEXT BOOK:
REFERENCES:

CS 9043 MULTI-CORE PROGRAMMING L T P C 3 0 0 3

AIM:
To learn about the techniques useful for programming parallel architectures in general, and multi-core processors in particular.

OBJECTIVES
• To realize the difference between programming for serial processors and parallel processors.
• To understand the challenges in parallel and multi-threaded programming.
• To learn about the various parallel programming paradigms, and solutions.

UNIT I INTRODUCTION TO MULTIPROCESSORS AND SCALABILITY ISSUES 9

UNIT II PARALLEL PROGRAMMING 9

UNIT III OPENMP PROGRAMMING 9

UNIT IV MPI PROGRAMMING 9
MPI Model – collective communication – data decomposition – communicators and topologies – point-to-point communication – MPI Library.

UNIT V MULTITHREADED APPLICATION DEVELOPMENT 9
Algorithms, program development and performance tuning.

TOTAL: 45 PERIODS

TEXT BOOKS:

REFERENCES:
AIM:
By using the well-tested and successful approach of problem-based learning, students will learn through applying the strategies and tools used in bioinformatics to topical problems drawn from ongoing research and applications in a variety of fields.

OBJECTIVES:
- To emphasize how to use the computer as a tool for biomedical research.
- To understand the use of Databases and Data mining concepts in the field of biology
- To study and understand the various modeling techniques that are used for modeling biological data
- To explore visualization techniques for DNA and RNA molecules
- To be aware of the microarray technology for genome expression study

UNIT I  INTRODUCTION  9
Need for Bioinformatics technologies – Overview of Bioinformatics technologies – Structural bioinformatics – Data format and processing – secondary resources and applications – Role of Structural bioinformatics - Biological Data Integration System.

UNIT II  DATAWAREHOUSING AND DATAMINING IN BIOINFORMATICS  9
Bioinformatics data – Data warehousing architecture – data quality – Biomedical data analysis – DNA data analysis – Protein data analysis – Machine learning – Neural network architecture and applications in bioinformatics

UNIT III  MODELING FOR BIOINFORMATICS  9
Hidden markov modeling for biological data analysis – Sequence identification – Sequence classification – multiple alignment generation – Comparative modeling – Protein modeling – genomic modeling – Probabilistic modeling – Bayesian networks – Boolean networks - Molecular modeling – Computer programs for molecular modeling

UNIT IV  PATTERN MATCHING AND VISUALIZATION  9

UNIT V  MICROARRAY ANALYSIS  9

TOTAL: 45 PERIODS

TEXT BOOKS:

REFERENCES:
AIM:
The course looks at the role of developers in areas such as test planning, implementation, and defect tracking. It explains how to review and manage test requirements and how to incorporate testing into the software development life cycle.

OBJECTIVES:
- To determine software testing objectives and criteria
- To develop and validate a test plan
- To select and prepare test cases
- To identify the need for testing
- To prepare testing policies and standards
- To use testing aids and tools
- To test before buying a software package
- Test after maintenance and enhancement changes
- To measure the success of testing efforts

UNIT I   INTRODUCTION  8

UNIT II   TEST CASE DESIGN  11

UNIT III   LEVELS OF TESTING  9
The Need for Levels of Testing – Unit Test – Unit Test Planning –Designing the Unit Tests - The Test Harness – Running the Unit tests and Recording results – Integration tests – Designing Integration Tests – Integration Test Planning – Scenario testing – Defect bash elimination System Testing – Acceptance testing – Performance testing - Regression Testing – Internationalization testing – Ad-hoc testing - Alpha, Beta Tests – testing OO systems – Usability and Accessibility testing – Configuration testing - Compatibility testing – Testing the documentation – Website testing

UNIT IV   TEST MANAGEMENT  9

UNIT V   TEST AUTOMATION  8

TOTAL: 45 PERIODS
TEXT BOOKS:

REFERENCES:

IT 9351 SERVICE ORIENTED ARCHITECTURE  L T P C
3 0 0 3

AIM:
To provide an overview of Service Oriented Architecture and enable the student to create applications in a collaborative environment.

OBJECTIVES:
- To study the importance of Service Oriented Architecture.
- Implementation of SOA in the Java and .NET frameworks.
- To study the advanced features of SOA.

UNIT I SOA BASICS 9

UNIT II WEB SERVICES 9

UNIT III COMPOSING WEB SERVICES 9

UNIT IV JAVA WEB SERVICES 9

UNIT V WEB SERVICE TRANSACTION 9

TOTAL: 45 PERIODS
TEXTBOOKS:

REFERENCES:

CS 9046 SYSTEM MODELING AND SIMULATION L T P C
3 0 0 3

AIM:
The aim of this course is to study the system modeling and simulation techniques, which finds application in diverse fields.

OBJECTIVE:
- The objective of this course is to introduce the fundamental principles and concepts in the general area of systems and simulation. The purpose is to learn about the overview of computer simulation concepts, overview of modeling theory, review of probability distributions and queuing theory, random number generation, probability distribution generation, data collection and input analysis, discrete modeling and simulation concepts, state based models, Markov models, model validation and verification and some simulation systems and languages.

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 - Simulation Examples

UNIT II MATHEMATICAL MODELS

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

TEXT BOOKS:

REFERENCES

CS 9047  ADHOC AND SENSOR NETWORKS  L T P C
3 0 0 3

AIM:
To provide a strong foundation in wireless adhoc networks and sensor networks.

OBJECTIVES:
- To understand the issues of MAC layer and routing protocols
- To study about the different types of adhoc routing protocols
- To learn about the QoS aware adhoc routing protocols
- To study about power and energy management in adhoc networks
- To understand the routing and models of mesh networks.
- To study about the architecture and protocols of wireless sensor networks

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

UNIT II  QUALITY OF SERVICE

UNIT III  ENERGY MANAGEMENT AD HOC NETWORKS

UNIT IV  MESH NETWORKS
UNIT V  SENSOR NETWORKS

TOTAL: 45 PERIODS

TEXT BOOK:

REFERENCES:

CS 9048  EMBEDDED SYSTEMS  L T P C

3 0 0 3

AIM:
To provide sufficient Knowledge to understand the embedded systems design, embedded programming and their operating system.

OBJECTIVES:
• To provide in-depth knowledge about embedded processor, its hardware and software.
• To explain programming concepts and embedded programming in C and assembly language.
• To explain real time operating systems, inter-task communication and an embedded software development tool.

UNIT I  EMBEDDED COMPUTING
Challenges of Embedded Systems – Embedded system design process. Embedded processors – ARM processor – Architecture, ARM and Thumb Instruction sets

UNIT II  EMBEDDED C PROGRAMMING

UNIT III  OPTIMIZING ASSEMBLY CODE

UNIT IV  PROCESSES AND OPERATING SYSTEMS
Multiple tasks and processes – Context switching – Scheduling policies – Interprocess communication mechanisms – Exception and interrupt handling - Performance issues.

UNIT V  EMBEDDED SYSTEM DEVELOPMENT
Meeting real time constraints – Multi-state systems and function sequences. Embedded software development tools – Emulators and debuggers. Design methodologies – Case studies – Complete design of example embedded systems.

TOTAL: 45 PERIODS
TEXT BOOKS:

REFERENCES:

CS 9049 PROGRAMMING IN .NET

AIM
To enable the student to use the advanced features of C# programming in the .NET framework.

OBJECTIVES
- To study and implement applications using the Presentation Foundation.
- To study the features associated with enterprise services.
- To create distributed applications using Web services and remoting.
- To study the features of the Workflow Foundation
- To introduce the concepts of the Compact Framework.

UNIT I PRESENTATION FOUNDATION

UNIT II WEBSERVICES AND REMOTING

UNIT III ENTERPRISE SERVICES
Enterprise Services – Overview – COM+ Application – Message Queuing

UNIT IV WORKFLOW FOUNDATION

UNIT V COMPACT FRAMEWORK

TOTAL: 45 PERIODS

TEXT BOOKS

REFERENCES
AIM:
To understand the internals of a router and get an experience of designing such systems.

OBJECTIVES:
- To learn the functions of a router, and its architecture.
- To learn about Network processors – their architecture, programming issues, and design issues.

UNIT I ROUTING IN IP NETWORKS

UNIT II ROUTER ARCHITECTURE
Function of Router – Types – Elements – Packet flow – Packet Processing - Algorithms And Data Structures (packet buffer allocation, etc) - Packet processing functions (Bridge Algorithm, Table Lookup And Hashing, etc) - Protocol Software (threads, Interrupts, etc) - Hardware Architectures For Protocol Processing - Classification And Forwarding – Switching Fabrics.

UNIT III NETWORK PROCESSORS
Scalability With Parallelism And Pipelining - Complexity Of Network Processor Design (packet processing, ingress & egress processing, Macroscopic Data Pipelining And Heterogeneity etc) - Network Processor Architectures : architectural variety, Primary architectural characteristics, Packet Flow, Clock Rates, software architecture, Assigning Functionality To The Processor Hierarchy.

UNIT IV NP ARCHITECTURES
Issues In Scaling A Network Processor (processing hierarchy and scaling)– examples of commercial Network Processors : Multi-Chip Pipeline, Augmented RISC Processor, Embedded Processor Plus Coprocessors, etc. - Design Tradeoffs and consequences (Programmability Vs. Processing Speed , speed vs functionality. etc).

UNIT V CASE STUDY – NP ARCHITECTURE AND PROGRAMMING

TOTAL: 45 PERIODS

TEXT BOOKS:
1. Douglas E. Comer "Network System Design using Network Processors"

REFERENCES:
AIM:
To provide an understanding of the networking standards that can be adopted with the current day requirements of complex and voluminous content transfer over heterogeneous platforms.

OBJECTIVES:
• To know about the various standards adopted for handling high traffic.
• To have a primitive level performance analysis for few network constraints for various amount traffic with different networking standards.
• To get a feel of designing a High speed network setup with specialized hardware and optimization approaches like parallelism and pipelining.

UNIT I HIGH SPEED NETWORKS

UNIT II CONGESTION AND TRAFFIC MANAGEMENT

UNIT III ATM CONGESTION CONTROL

UNIT IV OPTICAL NETWORKS

UNIT V DESIGN TECHNIQUES
Design principles and trade offs-End-to-End Vs Hop-by-Hop-Control Mechanisms - Design techniques-Scaling time and space-specialized hardware implementation-parallelism and pipelining-data structure optimization-latency reduction.
Future trends: Changing resource tradeoffs-technology and applications.

TOTAL: 45 PERIODS

TEXT BOOKS:

REFERENCES:
AIM:
The aim of this course is to understand the fundamentals of ontologies and the role of ontologies in the web. The course also outlines the issues and languages of semantic web.

OBJECTIVES:
- To understand the fundamentals of ontologies.
- To know about the Semantic Web and the different languages used in the context of semantic web.
- To learn the methodologies used for ontology learning for semantic web.
- To know about ontology management and tools used for Ontology annotation.
- To comprehend the role of semantics in web services and to discuss some of the security issues.

UNIT I
INTRODUCTION

UNIT II
LANGUAGES FOR SEMANTIC WEB AND ONTOLOGIES

UNIT III
ONTOLOGY LEARNING FOR SEMANTIC WEB

UNIT IV
ONTOLOGY MANAGEMENT AND TOOLS

UNIT V
APPLICATIONS

TOTAL: 45 PERIODS

TEXT BOOKS:
REFERENCES:

CS 9073

SCIENTIFIC COMPUTING TECHNIQUES

L T P C

3 0 0 3

AIM:
The aim of the course is to provide the student with enough information that they may be able to understand the uses of computers for processing a simulating model of real time systems with a numerical analysis

OBJECTIVES:
• This course uses fitting, PDEs, Integrating etc., and introduce the student to practical/real world systems which require understanding and defy complete (if any) analytical methods towards their analysis and hence the requirement to form deep knowledge and create skills for numerical treatment of mathematical models governed by curve for modeling and simulation. This will include the mathematical, statistical and language tools required for specifying a model, running the simulation and analyzing the results.

UNIT I
INTRODUCTION TO SYSTEM MODELING
10

UNIT II
APPROXIMATIONS IN SCIENTIFIC COMPUTING
8

UNIT III
OPTIMIZATION
8
Optimization Problems - Existence and Uniqueness - Convexity - Optimization in One Dimension- Multidimensional Unconstrained Optimization - Constrained Optimization - Linear Programming

UNIT IV
ROOTS OF EQUATION, LINEAR ALGEBRAIC EQUATION AND INTERPOLATION
10
Graphical Method – Iterative Methods- Newton-Raphson Method- Break-Even Analysis- Gauss Elimination-Solution Of Linear Systems By Gaussian, Gauss-Jordan, Jacobi And
UNIT V  NUMERICAL ORDINARY AND PARTIAL DIFFERENTIATION AND INTEGRATION  9

TOTAL: 45 PERIODS

TEXT BOOKS:

REFERENCES:

CS 9074  SOFTWARE AGENTS  L T P C
         3 0 0 3

AIM:
This course aims at providing sufficient in depth knowledge in Software agents.

OBJECTIVES:
- The student can well understand the philosophy and psychology of both human agents and software agents regarding co ordinations operation and communication.
- Intelligent / Cognitive aspects are dealt with software knowledge support.

UNIT I  AGENTS – OVERVIEW  9
Agent Definition – Agent Programming Paradigms – Agent Vs Object – Aglet – Mobile Agents – Agent Frameworks – Agent Reasoning.

UNIT II  JAVA AGENTS  9

UNIT III  MULTIAGENT SYSTEMS  9
UNIT IV  INTELLIGENT SOFTWARE AGENTS  9
Interface Agents – Agent Communication Languages – Agent Knowledge
Representation – Agent Adaptability – Belief Desire Intension – Mobile Agent
Applications- Argumentic and Knowledge Sharing Agent.

UNIT V  AGENTS AND SECURITY  9
Agent Security Issues – Mobile Agents Security – Protecting Agents against Malicious
Hosts – Untrusted Agent – Black Box Security – Authentication for agents – Security
issues for Agents.

TOTAL: 45 PERIODS

TEXT BOOKS:

REFERENCES:

CS9075  NETWORK ANALYSIS AND MANAGEMENT  L T P C
                                                  3 0 0 3

AIM:
To introduce the performance analysis of networks and to understand the features and
structures required for network management.

OBJECTIVES:
▪ To make a quantitative analysis and performance of network
▪ To explore critical design issues and approaches to meet the communication
   requirements
▪ To manage today’s systems effectively and to plan intelligently for the future use of
   network management system

UNIT I  NETWORK ANALYSIS  9
Performance Characteristics – Requirement Analysis: Concepts –User, Device,
Network Requirements – Process –Developing RMA ,Delay, Capacity Requirements –
Specification.

UNIT II  PROBABILITY AND STOCHASTIC PROCESS  9
Overview of probability – Random variables-Stochastic process –Link Delay components

UNIT III  QUEUING MODELS  9
Markovian FIFO Queuing Systems – M/M/1 – M/M/a – M/M/∞ - M/G/1 – M/M/m/m and
other Markov – Non-Markovian and self-similar models – Network of Queues –Burke’s
Theorem –Jackson’s Theorem.

UNIT IV  NETWORK MONITORING  9
Monitoring & Control – Standard bodies -SNMP ,V2,V3,RMON1,RMON2
UNIT V NETWORK MANAGEMENT


TOTAL: 45 PERIODS

TEXT BOOKS:

REFERENCES:
3. Mauro and Schmidt,”Essential SNMP”, O’Reilly, 2001

CS 9077 REAL TIME SYSTEMS L T P C
3 0 0 3

AIM:
To study the adaptation of architecture and development methods to support real-time systems

OBJECTIVES:
▪ To characterize the problem space real-time systems address and what are the specialized requirements of real-time systems
▪ To describe the solutions for standard problems of real-time systems
▪ To characterize the solution space real-time systems employ and how these solutions tend to differ from other systems
▪ To describe and justify adaptations to the development process to support real-time systems
▪ To understand the evaluation of real time systems

UNIT I INTRODUCTION

UNIT II PROGRAMMING LANGUAGES AND TOOLS
UNIT III  REAL TIME DATABASES  9
Real time Databases - Basic Definition, Real time Vs General Purpose Databases, Main Memory Databases, Transaction priorities, Transaction Aborts, Concurrency Control Issues, Disk Scheduling Algorithms, Two-phase Approach to improve Predictability, Maintaining Serialization Consistency, Databases for Hard Real Time systems.

UNIT IV  COMMUNICATION  9

UNIT V  EVALUATION TECHNIQUES  9

TOTAL: 45 PERIODS

TEXT BOOK:

REFERENCES:

GE 9022  TOTAL QUALITY MANAGEMENT  L T P C
AIM:  3 0 0 3
To provide comprehensive knowledge about the principles, practices, tools and techniques of Total quality management.

OBJECTIVES:
• To understand the various principles, practices of TQM to achieve quality.
• To learn the various statistical approaches for Quality control.
• To understand the TQM tools for continuous process improvement.
• To learn the importance of ISO and Quality systems.

UNIT I  INTRODUCTION  9
UNIT II  TQM PRINCIPLES
Leadership – Strategic quality planning, Quality statements - Customer focus Customer orientation, Customer satisfaction, Customer complaints, Customer retention - Employee involvement – Motivation, Empowerment, Team and Teamwork, Recognition and Reward, Performance appraisal - Continuous process improvement – PDSA cycle, 5s, Kaizen - Supplier partnership – Partnering, Supplier selection, Supplier Rating.

UNIT III  TQM TOOLS & TECHNIQUES I

UNIT IV  TQM TOOLS & TECHNIQUES II

UNIT V  QUALITY SYSTEMS

TOTAL: 45 PERIODS

TEXT BOOK:

REFERENCES:

GE 9021  PROFESSIONAL ETHICS IN ENGINEERING  L T P C
3 0 0 3

AIM:
To sensitize the engineering students on blending both technical and ethical responsibilities.

OBJECTIVES:
- Identify the core values that shape the ethical behavior of an engineer.
- Utilize opportunities to explore one’s own values in ethical issues.
- Become aware of ethical concerns and conflicts.
- Enhance familiarity with codes of conduct.
- Increase the ability to recognize and resolve ethical dilemmas.
UNIT I  ENGINEERING ETHICS

UNIT II  ENGINEERING AS SOCIAL EXPERIMENTATION
Engineering as Experimentation – Engineers as Responsible Experimenters – Research Ethics - Codes of Ethics – Industrial Standards - A Balanced Outlook on Law – The Challenger Case Study

UNIT III  ENGINEER’S RESPONSIBILITY FOR SAFETY

UNIT IV  RESPONSIBILITIES AND RIGHTS

UNIT V  GLOBAL ISSUES

TOTAL: 45 PERIODS

TEXT BOOKS :

REFERENCES:

GE9023  FUNDAMENTALS OF NANOSCIENCE  L T P C
AIM:
To make the students understand the importance, relevance and potentialities of this emerging field of study.

OBJECTIVES:
- Study the basic nano technology and nano science.
- Understand interdisciplinary nature of this field.
- Understand the important role of physics, chemistry, biology.
- Recognize that the rules of nano science are fundamentally different than those we experience.
- Study the basic fabrication strategies of nano science.
UNIT I INTRODUCTION
Nanoscale Science and Technology- Implications for Physics, Chemistry, Biology and Engineering-Classifications of nanostructured materials- nano particles- quantum dots, nanowires-ultra-thinfilms-multilayered materials. Length Scales involved and effect on properties: Mechanical, Electronic, Optical, Magnetic and Thermal properties. Introduction to properties and motivation for study (qualitative only).

UNIT II PREPARATION METHODS
Bottom-up Synthesis-Top-down Approach: Precipitation, Mechanical Milling, Colloidal routes, Self-assembly, Vapour phase deposition, MOCVD, Sputtering, Evaporation, Molecular Beam Epitaxy, Atomic Layer Epitaxy, MOMBE.

UNIT III PATTERNING AND LITHOGRAPHY FOR NANOSCALE DEVICES
Introduction to optical/UV electron beam and X-ray Lithography systems and processes, Wet etching, dry (Plasma/reactive ion) etching, Etch resists-dip pen lithography

UNIT IV PREPARATION ENVIRONMENTS
Clean rooms: specifications and design, air and water purity, requirements for particular processes, Vibration free environments: Services and facilities required. Working Practices, Sample cleaning, Chemical Purification, Chemical and Biological contamination, Safety Issues, Flammable and Toxic Hazards, Biohazards.

UNIT V CHARACTERISATION TECHNIQUES
X-ray diffraction technique, Scanning Electron Microscopy - environmental techniques, Transmission Electron Microscopy including high-resolution imaging, Surface Analysis techniques- AFM, SPM, STM, SNOM, ESCA, SIMS-Nanoindentation

TOTAL: 45 PERIODS

TEXT BOOKS:

REFERENCES: