### ANNA UNIVERSITY OF TECHNOLOGY, MADURAI – 625 002

**B.E COMPUTER SCIENCE AND ENGINEERING**

**3, 4, 5, 6, 7, 8 th SEMESTER CURRICULAM AND SYLLABI**

**REGULATION 2010**

#### SEMESTER III

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### SEMESTER VIII – Elective VI

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<tr>
<th>CODE NO.</th>
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OBJECTIVES

The course objective is to develop the skills of the students in the areas of Transforms and Partial Differential Equations. This will be necessary for their effective studies in a large number of engineering subjects like heat conduction, communication systems, electro-optics and electromagnetic theory. The course will also serve as a pre requisite for post graduate and specialized studies and research.

UNIT I  FOURIER SERIES  


UNIT II  FOURIER TRANSFORMS  


UNIT III  PARTIAL DIFFERENTIAL EQUATIONS  

Formation of partial differential equations – Lagrange’s linear equation – Solutions of standard types of first order partial differential equations - Linear partial differential equations of second and higher order with constant coefficients.

UNIT IV  APPLICATIONS OF PARTIAL DIFFERENTIAL EQUATIONS  

Solutions of one dimensional wave equation – One dimensional equation of heat conduction – Steady state solution of two-dimensional equation of heat conduction(Insulated edges excluded) – Fourier series solutions in Cartesian coordinates.

UNIT V  Z-TRANSFORMS AND DIFFERENCE EQUATIONS  


Lectures : 45 Tutorials : 15 Total : 60

TEXT BOOK


REFERENCES

Aim: To master the design and applications of linear, tree, balanced tree, hashing, set, and graph structures.

Unit I Linear Structures

Abstract Data Types (ADT) – List ADT – array-based implementation – linked list implementation – cursor-based linked lists – doubly-linked lists – Circular linked lists - applications of lists –Stack ADT – Queue ADT – circular queue implementation – Applications of stacks and Queues

Unit II Tree Structures

Tree ADT – tree traversals – left child right sibling data structures for general trees –Binary Tree ADT – expression trees – applications of trees – binary search tree ADT –Threaded Binary Trees

Unit III Balanced Trees

AVL Trees – Splay Trees – B-Tree - heaps – binary heaps – applications of binary Heaps

Unit IV Hashing and Set


Unit V Graphs


Total: 45

TEXT BOOK

REFERENCES


AIM

To provide an in-depth knowledge of the design of digital circuits and the use of Hardware Description Language in digital system design.

OBJECTIVES

To understand different methods used for the simplification of Boolean functions
To design and implement combinational circuits
To design and implement synchronous sequential circuits
To design and implement asynchronous sequential circuits
To study the fundamentals of VHDL / Verilog HDL

UNIT I BOOLEAN ALGEBRA AND LOGIC GATES


UNIT II COMBINATIONAL LOGIC

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

UNIT III DESIGN WITH MSI DEVICES

Decoders and encoders - Multiplexers and de multiplexers - Memory and programmable logic - HDL for combinational circuits

UNIT IV SYNCHRONOUS SEQUENTIAL LOGIC

Sequential circuits – Flip flops – Analysis and design procedures - State reduction and state assignment - Shift registers – Counters – HDL for Sequential Circuits.

UNIT V ASYNCHRONOUS SEQUENTIAL LOGIC

Analysis and design of asynchronous sequential circuits - Reduction of state and flow tables – Race-free state assignment – Hazards. ASM Chart.

TUTORIAL = 15 TOTAL : 60

TEXT BOOK

REFERENCES
Aim: To understand the concepts of object-oriented programming and master OOP using C++.

UNIT I


UNIT II


UNIT III

Function and class templates - Exception handling – try-catch-throw paradigm – exception specification – terminate and Unexpected functions – Uncaught exception.

UNIT IV


UNIT V


Total: 45

TEXT BOOKS:


REFERENCES:

UNIT I  FUNDAMENTALS OF ANALOG COMMUNICATION  9

Principles of amplitude modulation, AM envelope, frequency spectrum and band width, modulation index and percent modulation, AM Voltage distribution, AM power distribution, Angle modulation - FM and PM waveforms, phase deviation and modulation index, frequency deviation and percent modulation, frequency analysis of angle modulated waves. Bandwidth requirements for Angle modulated waves.

UNIT II DIGITAL COMMUNICATION  9

Introduction, Shannon limit for information capacity, digital amplitude modulation, frequency shift keying, FSK bit rate and baud, FSK transmitter, BW consideration of FSK, FSK receiver, phase shift keying – binary phase shift keying – QPSK, Quadrature Amplitude modulation, bandwidth efficiency, carrier recovery – squaring loop, Cost as loop, DPSK.

UNIT III DIGITAL TRANSMISSION  9


UNIT IV DATA COMMUNICATIONS  9

Introduction, History of Data communications, Standards Organizations for data communication, data communication circuits, data communication codes, Error control, Error Detection, Error correction, Data communication Hardware, serial and parallel interfaces, data modems, Asynchronous modem, synchronous modem, low-speed modem, medium and high speed modem, modem control.

UNIT V  SPREAD SPECTRUM AND MULTIPLE ACCESS TECHNIQUES  9

Introduction, Pseudo-noise sequence, DS spread spectrum with coherent binary PSK, processing gain, FH spread spectrum, multiple access techniques – wireless communication, TDMA and CDMA in wireless communication systems, source coding of speech for wireless communications.

TUTORIAL: 15
TOTAL: 45 +15=60

TEXT BOOKS:


REFERENCES:

AIM
The aim of this course is 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 participates.

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 –bio geographical 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 nonrenewable 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

TEXT BOOKS


REFERENCE BOOKS


LIST OF EXPERIMENTS

1. Verification of Boolean theorems using digital logic gates

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

3. Design and implementation of 4-bit binary adder / subtractor using basic gates and MSI devices

4. Design and implementation of parity generator / checker using basic gates and MSI devices

5. Design and implementation of magnitude comparator

6. Design and implementation of application using multiplexers/De multiplexers

7. Design and implementation of Shift registers

8. Design and implementation of Synchronous and Asynchronous counters

9. Simulation of combinational circuits using Hardware Description Language (VHDL/ Verilog HDL software required)

10. Simulation of sequential circuits using HDL (VHDL/ Verilog HDL software required)
AIM:
To develop programming skills in design and implementation of data structures and their applications.

1. Implement singly and doubly linked lists.
2. Represent a polynomial as a linked list and write functions for polynomial addition.
3. Implement stack and use it to convert infix to postfix expression
4. Implement a double-ended queue (de queue) where insertion and deletion operations are possible at both the ends.
5. Implement an expression tree. Produce its pre-order, in-order, and post-order traversals.
6. Implement binary search tree.
7. Implement insertion in AVL trees.
8. Implement priority queue using binary heaps
9. Implement hashing with open addressing.
10. Implement Prim's algorithm using priority queues to find MST of an undirected graph.

**Total: 45**
1. Design C++ classes with static members, methods with default arguments, friend functions. (For example, design matrix and vector classes with static allocation, and a friend function to do matrix-vector multiplication)

2. Implement complex number class with necessary operator over loadings and type conversions such as integer to complex, double to complex, complex to double etc.

3. Implement Matrix class with dynamic memory allocation and necessary methods. Give proper constructor, destructor, copy constructor, and overloading of assignment operator.

4. Overload the new and delete operators to provide custom dynamic allocation of memory.

5. Develop a template of linked-list class and its methods.

6. Develop templates of standard sorting algorithms such as bubble sort, insertion sort, merge sort, and quick sort.

7. Design stack and queue classes with necessary exception handling.

8. Define Point class and an Arc class. Define a Graph class which represents graph as a collection of Point objects and Arc objects. Write a method to find a minimum cost spanning tree in a graph.

9. Develop with suitable hierarchy, classes for Point, Shape, Rectangle, Square, Circle, Ellipse, Triangle, Polygon, etc. Design a simple test application to demonstrate dynamic polymorphism and RTTI.

10. Write a C++ program that randomly generates complex numbers (use previously designed Complex class) and writes them two per line in a file along with an operator (+, -, *, or /). The numbers are written to file in the format (a + ib). Write another program to read one line at a time from this file, perform the corresponding operation on the two complex numbers read, and write the result to another file (one per line).
10177PQ401 PROBABILITY AND QUEUEING THEORY 3 1 0 4

(Common to CSE & IT)

AIM
The probabilistic models are employed in countless applications in all areas of science and engineering. Queuing theory provides models for a number of situations that arise in real life. The course aims at providing necessary mathematical support and confidence to tackle real life problems.

OBJECTIVES
At the end of the course, the students would
have a well – founded knowledge of standard distributions which can describe real life phenomena.
Acquire skills in handling situations involving more than one random variable and functions of random variables.
Understand and characterize phenomena which evolve with respect to time in a probabilistic manner.
Be exposed to basic characteristic features of a queuing system and acquire skills in analyzing queuing models.

UNIT I RANDOM VARIABLES 9 + 3
Discrete and continuous random variables - Moments - Moment generating functions and their properties.
Binomial, Poisson, Geometric, Negative binomial, Uniform, Exponential, Gamma, and Weibull distributions.

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

UNIT III MARKOV PROCESSES AND MARKOV CHAINS 9 +3
Classification - Stationary process - Markov process - Markov chains – Transition probabilities - Limiting distributions-Poisson process

UNIT IV QUEUEING THEORY 9 + 3
Markovian models – Birth and Death Queuing models- Steady state results: Single and multiple server queuing models- queues with finite waiting rooms- Finite source models-Little’s Formula

UNIT V NON-MARKOVIAN QUEUES AND QUEUE NETWORKS 9 + 3
M/G/1 queue- Pollaczek- Khintchine formula, series queues- open and closed networks

TUTORIAL 15 TOTAL : 60

TEXT BOOKS
1. O.C. Ibe, “Fundamentals of Applied Probability and Random Processes”, Elsevier, 1st Indian Reprint, 2007 (For units 1, 2 and 3).
2. D. Gross and C.M. Harris, “Fundamentals of Queuing Theory”, Wiley Student edition, 2004 (For units 4 and 5)

REFERENCES:


UNIT I  

UNIT II  

UNIT III  
Dynamic Programming: General Method – Multistage Graphs – All-Pair shortest paths – Optimal binary search trees – 0/1 Knapsack – Traveling sales person problem.

UNIT IV  

UNIT V  
Graph Traversals – Connected Components – Spanning Trees – Bi connected components – Branch and Bound: General Methods (FIFO & LC) – 0/1 Knapsack problem – Introduction to NP-Hard and NP-Completeness.

TUTORIAL = 15 Total = 60

TEXT BOOK:


REFERENCES:

UNIT I THE 8085 AND 8086 MICROPROCESSORS 9
8085 Microprocessor architecture-Addressing modes- Instruction set-Programming the 8085

UNIT II 8086 SOFTWARE ASPECTS 9

UNIT III MULTIPROCESSOR CONFIGURATIONS 9
Coprocessor Configuration – Closely Coupled Configuration – Loosely Coupled Configuration –8087 Numeric Data Processor – Data Types – Architecture –8089 I/O Processor –Architecture Communication between CPU and IOP

UNIT IV I/O INTERFACING 9

UNIT V MICROCONTROLLERS 9

TOTAL: 45

TEXT BOOKS

1. Ramesh S. Gaonkar ,”Microprocessor – Architecture, Programming and Applications with the 8085” Penram International Publisher , 5th Ed.,2006
2. Krishnakant, “Microprocessors and Microcontrollers, Programming and system design”, PHI Learning India, 2010

REFERENCES:

UNIT I BASIC STRUCTURE OF COMPUTERS  


UNIT II BASIC PROCESSING UNIT  


UNIT III PIPELINING  

Basic concepts – Data hazards – Instruction hazards – Influence on instruction sets – Data path and control considerations – Performance considerations – Exception handling.

UNIT IV MEMORY SYSTEM  


UNIT V I/O ORGANIZATION  


Text Book:


REFERENCES:

Aim: To learn the various aspects of operating systems such as process management, memory management, and I/O management

UNIT I PROCESSES AND THREADS


UNIT II PROCESS SCHEDULING AND SYNCHRONIZATION


UNIT III STORAGE MANAGEMENT


UNIT IV FILE SYSTEMS


UNIT V I/O SYSTEMS


Total: 45

TEXT BOOK:


REFERENCES:

UNIT I INTRODUCTION


UNIT II RELATIONAL MODEL


UNIT III DATABASE DESIGN


UNIT IV TRANSACTIONS


UNIT V IMPLEMENTATION TECHNIQUES


TOTAL = 45

TEXT BOOKS

REFERENCES
1. Write programs using the following system calls of UNIX operating system: fork, exec, getpid, exit, wait, close, stat, opendir, readdir
2. Write programs using the I/O system calls of UNIX operating system (open, read, write, etc)
3. Write C programs to simulate UNIX commands like ls, grep, etc.
4. Given the list of processes, their CPU burst times and arrival times, display/print the Gantt chart for FCFS and SJF. For each of the scheduling policies, compute and print the average waiting time and average turnaround time. (2 sessions)
5. Given the list of processes, their CPU burst times and arrival times, display/print the Gantt chart for Priority and Round robin. For each of the scheduling policies, compute and print the average waiting time and average turnaround time. (2 sessions)
6. Developing Application using Inter Process communication (using shared memory, pipes or message queues)
8. Implement some memory management schemes – I
9. Implement some memory management schemes – II
10. Implement any file allocation technique (Linked, Indexed or Contiguous)

Example for exercises 8 & 9:
Free space is maintained as a linked list of nodes with each node having the starting byte address and the ending byte address of a free block. Each memory request consists of the process-id and the amount of storage space required in bytes. Allocated memory space is again maintained as a linked list of nodes with each node having the process-id, starting byte address and the ending byte address of the allocated space. When a process finishes (taken as input) the appropriate node from the allocated list should be deleted and this free disk space should be added to the free space list. [Care should be taken to merge contiguous free blocks into one single block. This results in deleting more than one node from the free space list and changing the start and end address in the appropriate node]. For allocation use first fit, worst fit and best fit.
1. Data Definition, Table Creation, Constraints,
2. Insert, Select Commands, Update & Delete Commands.
3. Nested Queries & Join Queries
4. Views
5. High level programming language extensions (Control structures, Procedures and Functions).
6. Front end tools
7. Forms
8. Triggers
9. Menu Design
10. Reports.
11. Database Design and implementation (Mini Project).
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 of 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:
1. Programming with 8085
2. Programming with 8086-experiments including BIOS/DOS calls: Keyboard control, Display, File Manipulation.
3. Interfacing with 8085/8086-8255, 8253
4. Interfacing with 8085/8086-8279, 8251
5. 8051 Microcontroller based experiments for Control Applications
6. Mini- Project

TOTAL: 45 PERIODS

List of equipments/components for 30 students (two per batch)
1. 8085 Trainer Kit with onboard 8255, 8253, 8279 and 8251 – 15 nos.
2. TASM/MASM simulator in PC (8086 programs) – 30 nos.
3. 8051 trainer kit – 15 nos.
4. Interfacing with 8086 – PC add-on cards with 8255, 8253, 8279 and 8251 – 15 nos.
5. Stepper motor interfacing module – 5 nos.
7. ADC, DAC interfacing module – 5 nos.
8. CRO’s – 5 nos.
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 (i) Have knowledge of the concepts needed to test the logic of a program. (ii) Have an understanding in identifying structures on many levels.(iii)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.(iv) Be aware of the counting principles (v)Be exposed to concepts and properties of algebraic structures such as semi groups, monoids and groups.

UNIT I LOGIC AND PROOFS

Propositional Logic – Propositional equivalences-Predicates and quantifiers-Nested Quantifiers-Rules of inference-introduction to Proofs-Proof Methods and strategy

UNIT II COMBINATORICS

Mathematical inductions-Strong induction and well ordering-.The basics of counting-The pigeon hole principle –Permutations and combinations-Recurrence relations-Solving Linear recurrence relations-generating functions-inclusion and exclusion and applications.

UNIT III GRAPHS

Graphs and graph models-Graph terminology and special types of graphs-Representing 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 (Definitions and examples)

UNIT V LATTICES AND BOOLEAN ALGEBRA

Partial ordering-Posets-Lattices as Posets- Properties of lattices-Lattices as Algebraic systems –Sub lattices –direct product and Homomorphism-Some Special lattices- Boolean Algebra

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

TEXT BOOKS:

3. Chandrasekaran and UmaParvathi, “Discrete mathematics”, PHI Learning India, 2010
REFERENCES:


UNIT I SOFTWARE PRODUCT AND PROCESS


UNIT II SOFTWARE REQUIREMENTS


UNIT III ANALYSIS, DESIGN CONCEPTS AND PRINCIPLES


UNIT IV TESTING


UNIT V SOFTWARE PROJECT MANAGEMENT


TEXT BOOKS:

REFERENCES
UNIT I

Network architecture – layers – Physical links – Channel access on links – Hybrid multiple access techniques - Issues in the data link layer - Framing – Error correction and detection – Link-level Flow Control

UNIT II

Medium access – CSMA – Ethernet – Token ring – FDDI - Wireless LAN – Bridges and Switches

UNIT III


UNIT IV


UNIT V


TOTAL= 45 PERIODS

TEXT BOOK:


REFERENCES:

UNIT I AUTOMATA


UNIT II REGULAR EXPRESSIONS AND LANGUAGES

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


UNIT IV PROPERTIES OF CONTEXT-FREE LANGUAGES

Normal forms for CFG – Pumping Lemma for CFL – Closure Properties of CFL – Turing Machines – Programming Techniques for TM.

UNIT V UNDECIDABILITY

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.

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

TEXT BOOK


REFERENCES:

AIM
To have an understanding of foundations of design of assemblers, loaders, linkers, and macro processors.

OBJECTIVES
To understand the relationship between system software and machine architecture.
To know the design and implementation of assemblers
To know the design and implementation of linkers and loaders.
To have an understanding of macro processors.
To have an understanding of system software tools.

UNIT I INTRODUCTION
System software and machine architecture – The Simplified Instructional Computer (SIC) - Machine architecture - Data and instruction formats - addressing modes - instruction sets - I/O and programming.

UNIT II ASSEMBLERS

UNIT III LOADERS AND LINKERS

UNIT IV MACRO PROCESSORS

UNIT V SYSTEM SOFTWARE TOOLS
Text editors - Overview of the Editing Process - User Interface – Editor Structure. - Interactive debugging systems - Debugging functions and capabilities – Relationship with other parts of the system – User-Interface Criteria.

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

TEXT BOOK

REFERENCES

AIM:
To understand the concepts of object-oriented, event driven, and concurrent programming paradigms and develop skills in using these paradigms using Java.

UNIT I OBJECT-ORIENTED PROGRAMMING – FUNDAMENTALS

UNIT II OBJECT-ORIENTED PROGRAMMING – INHERITANCE

UNIT III EVENT-DRIVEN PROGRAMMING

UNIT IV GENERIC PROGRAMMING

UNIT V MULTI THREADED PROGRAMMING

TOTAL=45 PERIODS

TEXT BOOK

REFERENCES
1. Programs using TCP Sockets (like date and time server & client, echo server & client, etc..)
2. Programs using UDP Sockets (like simple DNS)
3. Programs using Raw sockets (like packet capturing and filtering)
4. Programs using RPC
5. Simulation of sliding window protocols Experiments using simulators (like OPNET)
6. Performance comparison of MAC protocols
7. Implementing Routing Protocols
8. Performance comparison of Routing protocols
9. Study of UDP performance
(Using C)

1. Implement a symbol table with functions to create, insert, modify, search, and display.
2. Implement pass one of a two pass assembler.
3. Implement pass two of a two pass assembler.
4. Implement a single pass assembler.
5. Implement a two pass macro processor
6. Implement a single pass macro processor.
7. Implement an absolute loader.
8. Implement a relocating loader.
9. Implement pass one of a direct-linking loader.
10. Implement pass two of a direct-linking loader.
11. Implement a simple text editor with features like insertion / deletion of a character, word, and sentence.
12. Implement a symbol table with suitable hashing

(For loader exercises, output the snap shot of the main memory as it would be, after the loading has taken place)

TOTAL=45 PERIODS
1. Develop Rational number class in Java. Use JavaDoc comments for documentation. Your implementation should use efficient representation for a rational number, i.e. (500 / 1000) should be represented as (½).

2. Develop Date class in Java similar to the one available in java.util package. Use JavaDoc comments.

3. Implement Lisp-like list in Java. Write basic operations such as 'car', 'cdr', and 'cons'. If L is a list [3, 0, 2, 5], L.car() returns 3, while L.cdr() returns [0,2,5].

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

5. Design a Vehicle class hierarchy in Java. Write a test program to demonstrate polymorphism.

6. Design classes for Currency, Rupee, and Dollar. Write a program that randomly generates Rupee and Dollar objects and write them into a file using object serialization. Write another program to read that file, convert to Rupee if it reads a Dollar, while leave the value as it is if it reads a Rupee.

7. Design a scientific calculator using event-driven programming paradigm of Java.

8. Write a multi-threaded Java program to print all numbers below 100,000 that are both prime and fibonacci number (some examples are 2, 3, 5, 13, etc.). Design a thread that generates prime numbers below 100,000 and writes them into a pipe. Design another thread that generates fibonacci numbers and writes them to another pipe. The main thread should read both the pipes to identify numbers common to both.

9. Develop a simple OPAC system for library using event-driven and concurrent programming paradigms of Java. Use JDBC to connect to a back-end database.

10. Develop multi-threaded echo server and a corresponding GUI client in Java.

11. [Mini-Project] Develop a programmer's editor in Java that supports syntax highlighting, compilation support, debugging support, etc.

TOTAL= 45 PERIODS
AIM:
To learn the basics of designing intelligent agents that can solve general purpose problems, represent and process knowledge, plan and act, reason under uncertainty and can learn from experiences

UNIT I PROBLEM SOLVING 9

UNIT II LOGICAL REASONING 9

UNIT III PLANNING 9
Planning with state-space search – partial-order planning – planning graphs – planning and acting in the real world

UNIT IV UNCERTAIN KNOWLEDGE AND REASONING 9

UNIT V LEARNING 9
Learning from observation - Inductive learning – Decision trees – Explanation based learning – Statistical Learning methods - Reinforcement Learning

TOTAL: 45 PERIODS

TEXT BOOK

REFERENCES
UNIT I LEXICAL ANALYSIS

Introduction to Compiling- Compilers-Analysis of the source program-The phases- Cousins-The grouping of phases- Compiler construction tools. The role of the lexical analyzer- Input buffering- Specification of tokens- Recognition of tokens-A language for specifying lexical analyzer.

UNIT II SYNTAX ANALYSIS and RUN-TIME ENVIRONMENTS

Syntax Analysis- The role of the parser- Context-free grammars- Writing a grammar- Top down parsing- Bottom-up Parsing- LR parsers- Constructing an SLR(1) parsing table. Type Checking- Type Systems- Specification of a simple type checker. Run-Time Environments- Source language issues- Storage organization- Storage allocation strategies.

UNIT III INTERMEDIATE CODE GENERATION

Intermediate languages- Declarations- Assignment statements - Boolean expressions- Case statements- Back patching- Procedure calls

UNIT IV CODE GENERATION

Issues in the design of a code generator- The target machine- Run-time storage management- Basic blocks and flow graphs- Next-use information- A simple code generator- Register allocation and assignment- The dag representation of basic blocks - Generating code from dags.

UNIT V CODE OPTIMIZATION


TOTAL: 75 PERIODS

TEXT BOOK


REFERENCES


OBJECTIVES:
1. To learn basic OO analysis and design skills through an elaborate case study
2. To use the UML design diagrams
3. To apply the appropriate design patterns

UNIT I
Introduction to OOAD – What is OOAD? – What is UML? What are the United process(UP) phases - Case study – the Next Gen POS system, Inception -Use case Modeling - Relating Use cases – include, extend and generalization.

UNIT II
Elaboration - Domain Models - Finding conceptual classes and description classes – Associations – Attributes – Domain model refinement – Finding conceptual class hierarchies- Aggregation and Composition- UML activity diagrams and modeling

UNIT III
System sequence diagrams - Relationship between sequence diagrams and use cases Logical architecture and UML package diagram – Logical architecture refinement – UML class diagrams - UML interaction diagrams

UNIT IV

UNIT V
UML state diagrams and modeling - Operation contracts- Mapping design to code –UML deployment and component diagrams

TOTAL: 45 PERIODS

TEXT BOOK :
2. Mahesh P Matha, Object Oriented Analysis and Design using UML”, PHI Learning India, 2010

REFERENCES:
UNIT I INSTRUCTION LEVEL PARALLELISM

ILP – Concepts and challenges – Hardware and software approaches – Dynamic scheduling – Speculation - Compiler techniques for exposing ILP – Branch prediction.

UNIT II MULTIPLE ISSUE PROCESSORS

VLIW & EPIC – Advanced compiler support – Hardware support for exposing parallelism – Hardware versus software speculation mechanisms – IA 64 and Itanium processors – Limits on ILP.

UNIT III MULTIPROCESSORS AND THREAD LEVEL PARALLELISM


UNIT IV MEMORY AND I/O


UNIT V MULTI-CORE ARCHITECTURES


TOTAL: 45 PERIODS

TEXT BOOKS


REFERENCES


OBJECTIVE: To develop a mini-project following the 12 exercises listed below.

1. To develop a problem statement.
2. Develop an IEEE standard SRS document. Also develop risk management and project plan (Gantt chart).
3. Identify Use Cases and develop the Use Case model.
4. Identify the business activities and develop an UML Activity diagram.
5. Identity the conceptual classes and develop a domain model with UML Class diagram.
6. Using the identified scenarios find the interaction between objects and represent them using UML Interaction diagrams.
7. Draw the State Chart diagram.
8. Identify the User Interface, Domain objects, and Technical services. Draw the partial layered, logical architecture diagram with UML package diagram notation.
9. Implement the Technical services layer.
10. Implement the Domain objects layer.
11. Implement the User Interface layer.
12. Draw Component and Deployment diagrams.

Suggested domains for Mini-project.
1. Passport automation system.
2. Book bank
3. Exam Registration
4. Stock maintenance system.
5. Online course reservation system
6. E-ticketing
7. Software personnel management system
8. Credit card processing
9. e-book management system
10. Recruitment system
11. Foreign trading system
12. Conference Management System
13. BPO Management System

Suggested Software Tools

Argo UML, Eclipse IDE, Visual Paradigm, Visual case, and Rational Suite

TOTAL: 45 PERIODS

Requirement for a batch of 30 students
S. No. Description of Equipment Quantity
Required
1. Software Tools
Argo UML, Eclipse IDE, Visual Paradigm, Visual case and Rational Suite
30 user License
2. PC’s 30
LIST OF EXPERIMENTS

1. Create a web page with the following using HTML
   i) To embed an image map in a web page
   ii) To fix the hot spots
   iii) Show all the related information when the hot spots are clicked.

2. Create a web page with all types of Cascading style sheets.

3. Client Side Scripts for Validating Web Form Controls using DHTML

4. Write programs in Java to create applets incorporating the following features:

5. Create a color palette with matrix of buttons Set background and foreground of the control text area by selecting a color from color palette.
   In order to select Foreground or background use check box control as radio buttons To set background images

6. Write programs in Java using Servlets: To invoke servlets from HTML forms To invoke servlets from Applets

7. Write programs in Java to create three-tier applications using JSP and Databases
   for conducting on-line examination for displaying student mark list. Assume that student information is available in a database which has been stored in a database server.

8. Programs using XML – Schema – XSLT/XSL

9. Programs using AJAX

10. Consider a case where we have two web Services- an airline service and a travel agent and the travel agent is searching for an airline. Implement this scenario using Web Services and Database.

TOTAL 15 + 45 = 60 PERIODS

TEXT BOOK


REFERENCES

Globalization has brought in numerous opportunities for the teeming millions, with more focus on the students’ overall capability apart from academic competence. Many students, particularly those from non-English medium schools, find that they are not preferred due to their inadequacy of communication skills and soft skills, despite possessing sound knowledge in their subject area along with technical capability. Keeping in view their pre-employment needs and career requirements, this course on Communication Skills Laboratory will prepare students to adapt themselves with ease to the industry environment, thus rendering them as prospective assets to industries. The course will equip the students with the necessary communication skills that would go a long way in helping them in their profession.

OBJECTIVES:
(i) To equip students of engineering and technology with effective speaking and listening skills in English.
(ii) 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 job.
(iii) To enhance the performance of students at Placement Interviews, Group Discussions and other recruitment exercises.

A. English Language Lab (18 Periods)
1. Listening Comprehension: (6)
   Listening and typing – Listening and sequencing of sentences – Filling in the blanks – Listening and answering questions.
2. Reading Comprehension: (6)
   Filling in the blanks – Close exercises – Vocabulary building – Reading and answering questions.
3. Speaking: (6)
   Conversations: Face to Face Conversation – Telephone conversation – Role play activities (Students take on roles and engage in conversation)

B. Discussion of audio-visual materials (6 periods)
(Samples are available to learn and practice)
1. Resume / Report Preparation / Letter Writing (1)
   Structuring the resume / report - Letter writing / Email Communication - Samples.
2. Presentation skills: (1)
   Elements of effective presentation – Structure of presentation - Presentation tools – Voice Modulation – Audience analysis - Body language – Video samples
3. Soft Skills: (2)
   Time management – Articulateness – Assertiveness – Psychometrics – Innovation and Creativity – Stress Management & Poise – Video Samples

4. Group Discussion: (1)
   Why is GD part of selection process ? - Structure of GD – Moderator – led and other GDs - Strategies in GD – Team work - Body Language - Mock GD - Video samples

5. Interview Skills: (1)
   Kinds of interviews – Required Key Skills – Corporate culture – Mock interviews - Video samples.

I. PC based session (Weightage 40%) 24 periods
II. Practice Session (Weightage – 60%) 24 periods
20
1. Resume / Report Preparation / Letter writing: Students prepare their own resume and report.
2. Presentation Skills: Students make presentations on given topics. (8)
3. **Group Discussion**: Students participate in group discussions. (6)
4. **Interview Skills**: Students participate in Mock Interviews (8)

**REFERENCES:**


**Lab Requirements:**

1. Teacher console and systems for students.

2. English Language Lab Software

3. Career Lab Software
UNIT I INTRODUCTION
Managerial Economics - Relationship with other disciplines - Firms: Types, objectives and goals - Managerial decisions - Decision analysis.

UNIT II DEMAND AND SUPPLY ANALYSIS
Demand - Types of demand - Determinants of demand - Demand function – Demand elasticity - Demand forecasting - Supply - Determinants of supply - Supply function -Supply elasticity.

UNIT III PRODUCTION AND COST ANALYSIS

UNIT IV PRICING
Determinants of Price - Pricing under different objectives and different market structures - Price discrimination - Pricing methods in practice – role of Government in pricing control.

UNIT V FINANCIAL ACCOUNTING (ELEMENTARY TREATMENT)

TEXT BOOKS:

REFERENCES:
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

Color Models – RGB, YIQ, CMY, HSV – Animations – General Computer Animation, Raster, Key frame - Graphics programming using OPENGL – Basic graphics primitives –Drawing three dimensional objects - Drawing three dimensional scenes

UNIT IV  MULTIMEDIA SYSTEM DESIGN


UNIT V  MULTI MEDIA FILE HANDLING


TOTAL = 45 PERIODS

TEXT BOOKS:


REFERENCES

UNIT I MOBILE NETWORKS
9

UNIT II WIRELESS NETWORKS
9
Wireless LANs and PANs – IEEE 802.11 Standard – Architecture – Services – Network – Hiper LAN – Blue Tooth- Wi-Fi – Wi MAX

UNIT III ROUTING
9

UNIT IV TRANSPORT AND APPLICATION LAYERS
9

UNIT V PERVERSIVE COMPUTING
9
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

TEXT BOOKS:

REFERENCES:
UNIT I  FUZZY SET THEORY  10
Introduction to Neuro – Fuzzy and Soft Computing – Fuzzy Sets – Basic Definition and Terminology –
Set-theoretic Operations – Member Function Formulation and Parameterization – Fuzzy Rules and Fuzzy
Input Space Partitioning and Fuzzy Modeling.

UNIT II  OPTIMIZATION  8
Derivative-based Optimization – Descent Methods – The Method of Steepest Descent – Classical

UNIT III  GENETIC ALGORITHMS  10
Introduction, Biological background – Creation of off springs – Encoding – binary, octal, hexa decimal,
permutation, value and tree encoding. Fitness function- reproduction – Roulette-wheel, Boltzmann,
tournament, rank, steady state selection – Generation gap and steady state replacement – Genetic
modeling – Inheritance operators – Cross over – single site – two point – multi point, uniform cross over-
Inversion and deletion – duplication – regeneration – mutation operator – bitwise operators –
Generational cycle – Convergence of GA – Applications – Multi level optimization – Advances in GA.

UNIT IV  NEURO FUZZY MODELING  9
Adaptive Neuro-Fuzzy Inference Systems – Architecture – Hybrid Learning Algorithm – Learning
Methods that Cross-fertilize ANFIS and RBFN – Coactive Neuro Fuzzy Modeling – Framework Neuron
Functions for Adaptive Networks – Neuro Fuzzy Spectrum.

UNIT V  APPLICATIONS OF COMPUTATIONAL INTELLIGENCE  8
Printed Character Recognition – Inverse Kinematics Problems – Automobile Fuel Efficiency Prediction –
Soft Computing for Color Recipe Prediction.

TOTAL: 45 PERIODS

TEXT BOOKS:
Education 2004.

REFERENCES:
Comp., 2006, New Delhi.
PHI Learning, 2010.
5. R.Eberhart, P.Simpson and R.Dobbins, “Computational Intelligence - PC Tools”, AP Professional,
Boston, 1996.
1. Implementation of Bresenhams Algorithm – Line, Circle, Ellipse.

2. Implementation of Line, Circle and ellipse Attributes

3. Two Dimensional transformations - Translation, Rotation, Scaling, Reflection, Shear.

4. Composite 2D Transformations

5. Cohen Sutherland 2D line clipping and Windowing

6. Sutherland – Hodgeman Polygon clipping Algorithm

7. Three dimensional transformations - Translation, Rotation, Scaling

8. Composite 3D transformations

9. Drawing three dimensional objects and Scenes

10. Generating Fractal images

TOTAL: 45 PERIODS

LIST OF EQUIPMENTS:

1) Turbo C

2) Visual C++ with OPENGL

3) Any 3D animation software like 3DSMAX, Maya, Blender
OBJECTIVE:
To expose students to FOSS environment and introduce them to use open source packages
1. Kernel configuration, compilation and installation: Download / access the latest kernel source code from kernel.org, compile the kernel and install it in the local system. Try to view the source code of the kernel
2. Virtualisation environment (e.g., xen, kqemu or lguest) to test an applications, new kernels and isolate applications. It could also be used to expose students to other alternate OSs like *BSD
3. Compiling from source: learn about the various build systems used like the auto* family, cmake, ant etc. instead of just running the commands. This could involve the full process like fetching from a cvs and also include autoconf, automake etc.,
4. Introduction to packet management system: Given a set of RPM or DEB, how to build and maintain, serve packages over http or ftp. and also how do you configure client systems to access the package repository.
5. Installing various software packages
Either the package is yet to be installed or an older version is existing. The student can practice installing the latest version. Of course, this might need internet access.
Install samba and share files to windows
Install Common Unix Printing System (CUPS)
6. Write userspace drivers using fuse -- easier to debug and less dangerous to the system (Writing full-fledged drivers is difficult at student level)
7. GUI programming: a sample programme – using Gambas since the students have VB knowledge. However, one should try using GTK or QT
8. Version Control System setup and usage using RCS, CVS, SVN
9. Text processing with Perl: simple programs, connecting with database e.g., MYSQL
10. Running PHP: simple applications like login forms after setting up a LAMP stack
11. Running Python: some simple exercise – e.g. Connecting with MySql database
12. Set up the complete network interface using ifconfig command like setting gateway, DNS, IP tables, etc.,

Resources:
An environment like FOSS Lab Server (developed by NRCFOSS containing the various packages)
OR
Equivalent system with Linux distro supplemented with relevant packages

Note:
Once the list of experiments are finalized, NRCFOSS can generate full lab manuals complete with exercises, necessary downloads, etc. These could be made available on NRCFOSS web portal.

TOTAL: 45 PERIODS

LIST OF EQUIPMENTS:
Hardware:
Minimum Requirements:
- 700 Mhz X86 Processor
- 384 MB of system memory (RAM)
- 40 GB of disk space
- Graphics card capable of 1024*768 resolution
- Sound Card
- Network or Internet Connection

Software:
Latest distribution of Linux 27
UNIT I CLIENT / SERVER CONCEPTS


UNIT II EJB ARCHITECTURE

EJB - EJB architecture - Overview of EJB software architecture - View of EJB - Conversation - Building and deploying EJBs - Roles in EJB.

UNIT III EJB APPLICATIONS

EJB session beans - EJB entity beans - EJB clients - EJB deployment - Building an application with EJB.

UNIT IV CORBA

CORBA - Distributed systems - Purpose - Exploring CORBA alternatives - Architecture overview - CORBA and networking Model - CORBA object model - IDL - ORB - Building an application with CORBA.

UNIT V COM

COM - Data types - Interfaces - Proxy and stub - Marshalling – Implementing Server/Client - Interface pointers - Object creation - Invocation - Destruction - Comparison COM and CORBA - Introduction to .NET - Overview of .NET architecture - Marshalling - Remoting.

TEXT BOOKS


REFERENCES


UNIT I 9

UNIT II 9

UNIT III 9

UNIT IV 9

UNIT V 9

TOTAL: 45 PERIODS

TEXT BOOK:

REFERENCES:
10144CSE11 MULTICORE PROGRAMMING 3 0 0 3

UNIT I INTRODUCTION TO MULTIPROCESSORS AND SCALABILITY ISSUES 9


UNIT II PARALLEL PROGRAMMING 9


UNIT III OPEN MP 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:


UNIT I


UNIT II

Controls – Modal and Modeless Dialog – Property – Data I/O – Sound – Timer

UNIT III

Memory management – SDI – MDI – MFC for Advanced windows user Interface – status bar and Toolbars – Tree view – List view – Threads

UNIT IV

ODBC – MFC Database classes – DAO - DLLs – Working with Images

UNIT V

COM Fundamentals – ActiveX control – ATL – Internet Programming

TOTAL: 45 PERIODS

TEXT BOOK


REFERENCES

UNIT I JAVA FUNDAMENTALS


UNIT II NETWORK PROGRAMMING IN JAVA


UNIT III APPLICATIONS IN DISTRIBUTED ENVIRONMENT


UNIT IV MULTI-TIER APPLICATION DEVELOPMENT


UNIT V ENTERPRISE APPLICATIONS


TOTAL: 45 PERIODS

TEXT BOOKS


REFERENCES


UNIT I  PARALLEL PROGRAMMING  


UNIT II MESSAGE-PASSING PROGRAMMING

The message-passing model – the message-passing interface – MPI standard – basic concepts of MPI: MPI_Init, MPI_Comm_size, MPI_Comm_rank, MPI_Send, MPI_Recv, MPI_Finalize – timing the MPI programs: MPI_Wtime, MPI_Wtick – collective communication: MPI_Bcast, MPI_Gather, MPI_Scatter – case studies: the sieve of Eratosthenes, Floyd's algorithm, Matrix-vector multiplication

UNIT III SHARED-MEMORY PROGRAMMING


UNIT IV PARALLEL ALGORITHMS – I


UNIT V PARALLEL ALGORITHMS – II


TOTAL: 45 PERIODS

TEXT BOOK:


REFERENCES:


UNIT I  INTRODUCTION  9

UNIT II  TEST CASE DESIGN  9

UNIT III  LEVELS OF TESTING  9

UNIT IV  TEST MANAGEMENT  9

UNIT V  CONTROLLING AND MONITORING  9

TOTAL: 45 PERIODS

TEXT BOOKS:

REFERENCES:
UNIT – I  INTRODUCTION  9


UNIT – II  LOGIC DESIGN  9


UNIT – III COMBINATIONAL AND SEQUENTIAL LOGIC  9


UNIT – IV DATA PATH CONTROLLERS, LOGIC AND STORAGE DEVICE  9


UNIT-V DIGITAL AND ARITHMETIC PROCESSOR  9


TOTAL : 45 PERIODS

TEXT BOOK :

1. Michael D.Ciletti “ Advanced Digital Design With the Verilog HDL “, PHI Learning, New Delhi-1, 2009
UNIT I SOLUTION OF EQUATIONS AND EIGENVALUE PROBLEMS


UNIT II INTERPOLATION AND APPROXIMATION

Lagrange Polynomials – Divided differences – Interpolating with a cubic spline – Newton’s forward and backward difference formulas.

UNIT III NUMERICAL DIFFERENTIATION AND INTEGRATION


UNIT IV INITIAL VALUE PROBLEMS FOR ORDINARY DIFFERENTIAL EQUATIONS


UNIT V BOUNDARY VALUE PROBLEMS IN ORDINARY AND PARTIAL DIFFERENTIAL EQUATIONS

Finite difference solution of second order ordinary differential equation – Finite difference solution of one dimensional heat equation by explicit and implicit methods – One dimensional wave equation and two dimensional Laplace and Poisson equations.

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

TEXT BOOKS:


REFERENCES:

UNIT I

UNIT II
The Buffer Cache-Headers-Buffer Pool-Buffer Retrieval-Reading and Writing Disk Blocks-Advantages and Disadvantages. Internal Representation of Files-Inodes- Structure-Directories-Path Name to Inode-Super Block-Inode Assignment-Allocation of Disk Blocks -Other File Types.

UNIT III

UNIT IV

UNIT V
Memory Management Policies-Swapping-Demand Paging-a Hybrid System- I/OSubsystem-Driver Interfaces- Disk Drivers - Terminal Drivers.

TOTAL: 45 PERIODS

TEXTBOOK

REFERENCES
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:


UNIT I  CISC PRINCIPLES


UNIT II  PENTIUM PROCESSORS


UNIT III  RISC PRINCIPLES


UNIT IV  RISC PROCESSOR


UNIT V  SPECIAL PURPOSE PROCESSORS


TOTAL: 45 PERIODS

TEXT BOOK:


REFERENCES:


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:


UNIT I EMBEDDED COMPUTING


UNIT II MEMORY AND INPUT / OUTPUT MANAGEMENT

Programming Input and Output – Memory system mechanisms – Memory and I/O devices and interfacing – Interrupts handling.

UNIT III PROCESSES AND OPERATING SYSTEMS

Multiple tasks and processes – Context switching – Scheduling policies – Inter process communication mechanisms – Performance issues.

UNIT IV EMBEDDED SOFTWARE

Programming embedded systems in assembly and C – Meeting real time constraints – Multi-state systems and function sequences. Embedded software development tools – Emulators and debuggers.

UNIT V EMBEDDED SYSTEM DEVELOPMENT

Design issues and techniques – Case studies – Complete design of example embedded systems.

TOTAL = 45 PERIODS

TEXT BOOK:


REFERENCES:


3. Santanu Chattopadhyay, Embedded System Design”, PHI Learning, India 2010

UNIT I  LINEAR PROGRAMMING  

UNIT II  DUALITY AND NETWORKS  

UNIT III  INTEGER PROGRAMMING  
Cutting plan algorithm – Branch and bound methods, Multistage (Dynamic) programming.

UNIT IV  CLASSICAL OPTIMISATION THEORY  

UNIT V  OBJECT SCHEDULING:  
Network diagram representation – Critical path method – Time charts and resource leveling – PERT.

TOTAL: 45 PERIODS

TEXT BOOK:

REFERENCES:
UNIT I DATA WAREHOUSING


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 Back propagation – 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:

UNIT I  INTRODUCTION  

UNIT II  PROGRAMMING LANGUAGES AND TOOLS  

UNIT III  REAL TIME DATABASES  
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  

UNIT V  EVALUATION TECHNIQUES  

TOTAL= 45 PERIODS

TEXT BOOKS:

REFERENCES:
UNIT I   INTRODUCTION


UNIT II   TCP


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


TOTAL: 45 PERIODS

TEXT BOOKS:


REFERENCES:


UNIT I

Introduction – Models -and Algorithms - The Turing Test -Regular Expressions Basic Regular Expression Patterns -Finite State Automata -Regular Languages and FSAs – Morphology -Inflectional Morphology -Derivational Morphology -Finite-State Morphological Parsing - Combining an FST Lexicon and Rules - Porter Stemmer

UNIT II

N-grams Models of Syntax - Counting Words - Unsmoothed N-grams – Smoothing- Backoff - Deleted Interpolation – Entropy - English Word Classes - Tagsets for English -Part of Speech Tagging -Rule-Based Part of Speech Tagging - Stochastic Part of Speech Tagging - Transformation-Based Tagging -

UNIT III


UNIT IV


UNIT V


TOTAL: 45 PERIODS

TEXT BOOKS:

1. D. Jurafsky and J. Martin “Speech and Language Processing: An Introduction to Natural Language Processing, Computational Linguistics, and Speech Recognition”,

2. C. Manning and H. Schutze, “Foundations of Statistical Natural Language Processing”,

REFERENCE:

UNIT I INTRODUCTION


UNIT II HUMAN COMPUTER INTERACTION


UNIT III WINDOWS


UNIT IV MULTIMEDIA


UNIT V WINDOWS LAYOUT – TEST


TOTAL: 45 PERIODS

TEXT BOOKS:


REFERENCES:

UNIT I

UNIT II

UNIT III

UNIT IV
SOA platform basics – SOA support in J2EE – Java API for XML-based web services (JAX-WS) - Java architecture for XML binding (JAXB) – Java API for XML Registries (JAXR) - Java API for XML based RPC (JAX-RPC)- Web Services Interoperability Technologies (WSIT) - SOA support in .NET – Common Language Runtime - ASP.NET web forms – ASP.NET web services – Web Services Enhancements (WSE)

UNIT V
WS-BPEL basics – WS-Coordination overview - WS-Choreography, WS-Policy, W S Security

TOTAL: 45 PERIODS

TEXT BOOK:

REFERENCES:
UNIT I

UNIT II

UNIT III

UNIT IV

UNIT V

TOTAL: 45 PERIODS

TEXT BOOK:

REFERENCES:
1. Andrew S.Tanenbaum, "Modern operating system", PHI, 2003
3. Andrew S.Tanenbaum, "Distributed operating system", Pearson education, 2003
UNIT I
9

UNIT II
9

UNIT III
9

UNIT IV
9

UNIT V
9

TOTAL : 45 PERIODS

TEXT BOOKS:


3. Sathiaseelan JGR and N Sasikaladevi, “Programming with C# and .NET”, PHI Learning, India 2009

REFERENCES:


UNIT I WIRELESS COMMUNICATION

Cellular systems- Frequency Management and Channel Assignment- types of handoff and their characteristics, dropped call rates & their evaluation - MAC – SDMA – FDMA – TDMA – CDMA – Cellular Wireless Networks

UNIT II WIRELESS LAN

IEEE 802.11 Standards – Architecture – Services – Mobile Ad hoc Networks- WiFi and WiMAX - Wireless Local Loop

UNIT III MOBILE COMMUNICATION SYSTEMS


UNIT IV MOBILE NETWORK AND TRANSPORT LAYERS


UNIT V APPLICATION LAYER

WAP Model- Mobile Location based services -WAP Gateway –WAP protocols – WAP user agent profile- caching model-wireless bearers for WAP - WML – WML Scripts – WTA - iMode- SyncML

TOTAL : 45 PERIODS

TEXT BOOKS:

REFERENCES:
UNIT I  INTRODUCTION


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:

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:


UNIT I

UNIT II

UNIT III

UNIT IV

UNIT V

TOTAL = 60 PERIODS

TEXT BOOKS:
3. VK Pachghare, ”Cryptography and Information Security”, PHI Learning India, 2010

REFERENCES:
UNIT I ELEMENTARY TCP SOCKETS


UNIT II APPLICATION DEVELOPMENT


UNIT III SOCKET OPTIONS, ELEMENTARY UDP SOCKETS


UNIT IV ADVANCED SOCKETS


UNIT V SIMPLE NETWORK MANAGEMENT


TOTAL : 45 PERIODS

TEXT BOOKS:


REFERENCES:


UNIT I INTRODUCTION


UNIT II TREES, CONNECTIVITY, PLANARITY


UNIT III MATRICES, COLOURING AND DIRECTED GRAPH


UNIT IV ALGORITHMS


UNIT V ALGORITHMS


TOTAL: 45 PERIODS

TEXT BOOKS:


REFERENCES:

UNIT I FUNDAMENTALS OF SOFTWARE QUALITY ASSURANCE


UNIT II MANAGING SOFTWARE QUALITY


UNIT III SOFTWARE QUALITY ASSURANCE METRICS

Software Quality – Total Quality Management (TQM) – Quality Metrics – Software Quality Metrics Analysis

UNIT IV SOFTWARE QUALITY PROGRAM


UNIT V SOFTWARE QUALITY ASSURANCE STANDARDIZATION

Software Standards–ISO 9000 Quality System Standards - Capability Maturity Model and the Role of SQA in Software Development Maturity – SEI CMM Level 5 – Comparison of ISO 9000 Model with SEI’s CMM

TOTAL : 45 PERIODS

TEXT BOOKS:


REFERENCES:


UNIT I


UNIT II

Distributed Objects and Remote Invocation-Introduction-Communication between distributed objects-Remote procedure calls-Events and notifications-Case study: Java RMI. Operating System Support-Introduction-OS layer-Protection-Processes and threads- Communication and invocation OS architecture.

UNIT III

Distributed File Systems-Introduction-File service architecture- Case Study: Sun Network File System-Enhancements and further developments. Name Services-Introduction-Name Services and the Domain Name System-Directory Services-Case Study: Global Name Service.

UNIT IV

Time and Global States-Introduction-Clocks, events and process states-Synchronizing physical clocks-Logical time and logical clocks-Global states-Distributed debugging. Coordination and Agreement-Introduction-Distributed mutual exclusion-Elections- Multicast communication-Consensus and related problems.

UNIT V

Distributed Shared Memory-Introduction-Design and implementation issues-Sequential consistency and Ivy case study Release consistency and Munin case study-Other consistency models. CORBA Case Study- Introduction-CORBA RMI-CORBA services.

TOTAL: 45 PERIODS

TEXT BOOK:


REFERENCES:


UNIT I

Decision Making and computerized support: Management support systems. Decision making systems modeling- support.

UNIT II


UNIT III

Collaboration, Communicate Enterprise Decision Support System & Knowledge management – Collaboration Com Technologies Entreprise information system – knowledge management.

UNIT IV


UNIT V


TOTAL: 45 PERIODS

TEXT BOOKS:


REFERENCES:


2. Decision Support systems and Data warehouse Systems by Efrem G Mallach- McGraw Hill
UNIT I  SIGNALS AND SYSTEMS  9

UNIT II  FREQUENCY TRANSFORMATIONS  9

UNIT III  IIR FILTER DESIGN  9
Structures of IIR – Analog filter design – Discrete time IIR filter from analog filter – IIR filter design by Impulse Invariance, Bilinear transformation, Approximation of derivatives – (HPF, BPF, BRF) filter design using frequency translation

UNIT IV  FIR FILTER DESIGN  9
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  9

TOTAL: 45 PERIODS

TEXT BOOKS:

REFERENCES:
UNIT I FUNDAMENTALS OF IMAGE PROCESSING


UNIT II IMAGE ENHANCEMENT


UNIT III IMAGE SEGMENTATION AND FEATURE ANALYSIS


UNIT IV MULTI RESOLUTION ANALYSIS AND COMPRESSIONS


UNIT V APPLICATIONS OF IMAGE PROCESSING


TOTAL : 45 PERIODS

TEXT BOOKS:


REFERENCES:


UNIT I
9
Introduction to molecular biology – the genetic material – gene structure – protein structure – chemical bonds – molecular biology tools – genomic information content

UNIT II
9

UNIT III
9

UNIT IV
9

UNIT V
9

TOTAL: 45 PERIODS

TEXT BOOK

REFERENCES
UNIT I INTRODUCTION


UNIT II SECURITY INVESTIGATION

Need for Security, Business Needs, Threats, Attacks, Legal, Ethical and Professional Issues

UNIT III SECURITY ANALYSIS

Risk Management: Identifying and Assessing Risk, Assessing and Controlling Risk

UNIT IV LOGICAL DESIGN


UNIT V PHYSICAL DESIGN


TOTAL: 45 PERIODS

TEXT BOOK:


REFERENCES:


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:

UNIT I


UNIT II

Union Government – Structures of the Union Government and Functions – President – Vice President – Prime Minister – Cabinet – Parliament – Supreme Court of India – Judicial Review.

UNIT III


UNIT IV

Indian Federal System – Center – State Relations – President’s Rule – Constitutional Amendments – Constitutional Functionaries - Assessment of working of the Parliamentary System in India.

UNIT V

Society : Nature, Meaning and definition; Indian Social Structure; Caste, Religion, Language in India; Constitutional Remedies for citizens – Political Parties and Pressure Groups; Right of Women, Children and Scheduled Castes and Scheduled Tribes and other Weaker Sections.

TOTAL: 45 PERIODS

TEXT BOOKS:


REFERENCES:

UNIT I HIGH SPEED NETWORKS


UNIT II CONGESTION AND TRAFFIC MANAGEMENT


UNIT III TCP AND ATM CONGESTION CONTROL


UNIT IV INTEGRATED AND DIFFERENTIATED SERVICES


UNIT V PROTOCOLS FOR QOS SUPPORT


TOTAL: 45 PERIODS

TEXT BOOKS:


REFERENCES:


UNIT I SCOPE OF ROBOTS AND INTELLIGENCE


UNIT II ROBOT COMPONENTS


UNIT III ROBOT PROGRAMMING

Robot Programming - Methods - interlocks textual languages. Characteristics of Robot level languages, characteristic of task level languages.

UNIT IV ROBOT WORK CELL

Robot Cell Design and Control - Remote Center compliance - Safety in Robotics.

UNIT V FUTURE TRENDS


TOTAL: 45 PERIODS

TEXTBOOK:


REFERENCES:


UNIT I FOUNDATION

UNIT II QUBITS AND QUANTUM MODEL OF COMPUTATION

UNIT III QUANTUM ALGORITHMS – I

UNIT IV QUANTUM ALGORITHMS – II

UNIT V QUANTUM COMPUTATIONAL COMPLEXITY AND ERROR CORRECTION

TOTAL: 45 PERIODS

TEXT BOOK:

REFERENCES
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

List of globally available Middlewares - Case Studies-Recent version of Globus Toolkit and gLite - Architecture, Components and Features.

TOTAL: 45 PERIODS

TEXT BOOK:


REFERENCES:


UNIT I  INTRODUCTION


UNIT II  KNOWLEDGE REPRESENTATION AND REASONING

Logical Agents-First order logic-First Order Inference-Unification-Chaining- Resolution Strategies-Knowledge Representation-Objects-Actions-Events

UNIT III  PLANNING AGENTS


UNIT IV  AGENTS AND UNCERTAINTY


UNIT V  HIGHER LEVEL AGENTS

Knowledge in Learning-Relevance Information-Statistical Learning Methods- Reinforcement Learning-Communication-Formal Grammar-Augmented Grammars- Future of AI.

TOTAL: 45 PERIODS

TEXT BOOK:


REFERENCES:


Aim: To understand the technology behind cloud computing, the benefits and applications

Objectives:

To understand the basic concepts and the technology involved in cloud computing

To understand the implementation and service models available for cloud computing

To realize the benefits and advantages of cloud computing

UNIT – I CLOUD COMPUTING BASICS


UNIT – II BUSINESS CASE FOR CLOUD


UNIT – III CLOUD COMPUTING TECHNOLOGY


UNIT – IV CLOUD COMPUTING AT WORK

Software as a service – Overview – driving forces – Company offerings – Industries – Software plus services – Overview – Mobile device integration – Providers – Microsoft online – Developing applications.

UNIT – V THIN CLIENT - CLOUD COMPUTING

Local clouds and thin clients – virtualization in organization – server solutions – Thin clients – Migrating to the cloud – Cloud services for individuals – Cloud services for mid-market – Enterprise class cloud offerings – Migration – Best practices and future of cloud computing.

Total: 45 Periods

TEXT BOOK

UNIT – I  INTRODUCTION


UNIT - II  NETWORKS and SEARCH ENGINES


UNIT – III  DATA VISUALIZATION AND STATISTICS


UNIT - IV  DATA MINING AND PATTERN MATCHING


UNIT –V  MODELING, SIMULATION AND COLLABORATION


Total : 45 Periods

TEXT BOOK:

UNIT I INTRODUCTION TO SOFTWARE PROJECT MANAGEMENT 9

Project Definition – Contract Management – Activities Covered By Software Project Management – Overview Of Project Planning – Stepwise Project Planning.

UNIT II PROJECT EVALUATION 9


UNIT III ACTIVITY PLANNING 9


UNIT IV MONITORING AND CONTROL 9


UNIT V MANAGING PEOPLE AND ORGANIZING TEAMS 9


TOTAL: 45 PERIODS

TEXT BOOK:


REFERENCES:

