

Programme Structure & Syllabus for M.Sc. I.T. Programme

Programme Structure

First Semester

Subject Code	Subject Title	Type of Course	Credits	CIA	Ext.	Total Marks
MIT 101	Introduction to Information Technology	C	4	40	60	100
MIT 102	Introduction to Programming Language through C (C)	C	4	40	60	100
MIT 103	Operating Systems and System Software (OS)	C	4	40	60	100
MIT 104	Data Structures and Algorithms	C	4	40	60	100
MIT 105	Basic Electronics and Communication (E&C)	C	4	40	60	100
MIT 106	Lab 1 (based on C, OS and E&C)	C	4	40	60	100
SS	Soft Skill Elective	SS	4	40	60	100

Second Semester

MIT 201	Computer Organization & Architecture	C	4	40	60	100
MIT 202	Data Base Management System (DBMS)	C	4	40	60	100
MIT 203	Object Oriented Programming Structures (OOPS)	C	4	40	60	100
MIT 204	Data Communication and Computer Networks	C	4	40	60	100
MIT 205	Lab 2 (based on DBMS)	C	4	40	60	100
MIT 206	Lab 3 (based on OOPS)	C	4	40	60	100
SO	Social Orientation Elective	SO	4	40	60	100

Third Semester

MIT 301	Software Engineering	C	4	40	60	100
MIT 302	Formal Languages and Automata Theory	C	4	40	60	100
MIT 303	Introduction to Java	C	4	40	60	100
MIT 304	Visual Language Programming	C	4	40	60	100
Elective	Elective Course- I	E	4	40	60	100
MIT 306	Lab 4 (based on Java)	C	4	40	60	100
MIT 307	Lab 5 (based on Visual Programming)	C	4	40	60	100

Fourth Semester

MIT 401	Computer Graphics	C	4	40	60	100
Elective	Elective Course– II	E	4	40	60	100
MIT 403	Lab 6 (based on Computer Graphics)	C	4	40	60	100
MIT 404	Industrial Training	C	4	40	60	100
MIT 405	Project	C	12	120	180	300

Notes:

C: Core

E: Elective

SS: Soft Skill

SO: Social Orientation

1. Soft Skill Electives:

SS 01 - I T Skills (Not available to MSc. I.T students.)

SS 02 - Communication Skills (Not available to MA English students.)

SS 03- Management Skills (Not available to MBA students.)

2. Social Orientation Electives:

SO 01 - Human Rights

SO 02 - Disaster Management

SO 03 - Environment and sustainable Development

3. List of Electives for Elective Course I and Elective Course II.

MIT E01 - Web design & development

MIT E02 - Artificial Intelligence

MIT E03 - Network Security

MIT E04 - Distributed Computing

MIT E05 - E-Commerce

MIT E06 - Compiler Design

MIT E07 - Object Oriented Analysis and Design

MIT E08 - Bioinformatics

MIT E09 - Pattern Recognition

MIT E10 - Multimedia Database Systems

MIT E11 - Soft Computing

MIT E12 - Embedded Systems

MIT E13 - Mobile Computing

MIT E14 - Data Mining

MIT E15 - Multimedia Technologies

MIT E16 - Managing Information System

MIT E17 - Management Science

MIT E18 - Enterprise Resource Planning (ERP)

MIT E19 - Open Elective

ELECTIVES WILL BE OFFERED SUBJECT TO THE AVAILABILITY OF FACULTY

Detailed Syllabus

MIT-101 Introduction to Information Technology

Unit-I

Introduction to computers: Computer system concepts, characteristics of computer, generations and types of computer, components of computer system, Booting process, classification of digital computer system, organization of computers. Input and Output devices, Storage devices.

Unit-II

Computer software : System software, application software, firmware, Programming languages classification: machine language, assembly language & high-level language. Evolution of programming languages: first generation, second generation, third generation & fourth generation languages, Language translator: Compiler, Interpreter, Assembler. Operating System - Definition, Job, Objective and evolution of operating system, Types of operating systems.

Unit-III

Network Communication : Definition, Criteria, advantages and limitations of computer networking, Communication process, Communication types, Types of computer network, Network topology, LAN and other network related protocols, OSI model, TCP/IP model, Networking Components.

Unit-IV

Network Applications- Internet: Introduction, Internet basic, Internet protocols, Internet addressing, Browser WWW, E-mail, telnet, ftp, application, benefits and limitation of internet, electronic conferencing, and teleconferencing.

Unit-V

Latest IT Trends:-e-Commerce, M-Commerce, Artificial Intelligence, Computational Intelligence, Geographic Information System (GIS), Data Mining. Role of IT in different Area - Education, Industry, Banking, Marketing, Public Services and others.

References:

1. Computer fundamentals: By V. Rajaraman ; PHI
2. Fundamentals of IT: Leon and Leon; Leon Tec World
3. Fundamentals of Information Technology, Alexis Lean and Mathews Leon, Vikas Publication House, Delhi
4. Information Technology - inside and outside, Cyganski, Pearson Publication
5. Introduction to computer Science, IITL ESL, Pearson Education

MIT-102 Introduction to Programming Language through 'C'

Unit-I

Basic Programming Concepts: Introduction to the basic ideas of problem solving and programming using principles of top-down modular design, Flowcharts, Compilation of a Program with examples

Unit-II

Introduction to Programming Language C: Data Types, Instruction and its Types, Storage Classes, Operators and Hierarchy of Operations, Expressions in C, Control and Repetitive Statements, break, continue, Arrays, Strings,

Unit-III

Functions: User Defined Functions and Library Functions, Local and Global Variables, Parameter Passing, Pointers, C Preprocessors, Structures, Union,

Unit- IV

Input and Output in C, C-Library, File: Introduction, Streams and File types, file Operations, File I/O, Low level Disk I/O, Command line Arguments, and Software Interrupts.

Unit V

Graphics Library: initgraph function, clrscr(), Pixel Drawing, line(), circle(), rectangle(), closegraph(), setcolor(), setlinestyle(), setfillstyle(), floodfill(), sound and motion.

References:

1. Y. Kanetkar, Let us C, BPB Publications.
2. Programming in ANSI C by E Balaguruswami, Tata McGraw Hill
3. Schaum's Outline of Theory and Problems of programming with C, B.S.Gottfried, McGraw-Hill.
4. C Made Easy, H.Schildt, Osborne McGraw-Hill.
5. A Structured Programming Approach Using C, Behrouz A Forouzan, Cengage Learning

Unit-I

Introduction: Definition, Design Goals, Evolution; Concept of User, job and Resources; Batch processing, Multi-programming, Time sharing; Structure and Functions of Operating System. Process Management: Process states, State Transitions, Process Control block, Context Switching, Process Scheduling, Scheduling algorithm, Threads.

Unit-II

Inter process synchronization and communication: need, Mutual exclusion, semaphore and hardware support for mutual exclusion, queuing implementation, and classical problem in concurrent programming, critical region and conditional critical region, Monitors, Messages, Deadlock

Unit-III

Management (Contiguous and non contiguous) : Address Binding, Dynamic Loading and Linking Concepts, Logical and Physical Addresses, Contiguous Allocation, Fragmentation, Paging, Segmentation, Virtual Memory, Demand Paging, Page fault, Page replacement algorithms, Global Vs Local Allocation, Thrashing, Working Set Model, Paging.

Unit- IV

File : File Attributes, File Types, File Access Methods, Directory Structure, File System Organization and Mounting, Allocation Methods, Free Space management; Secondary.

Unit-V

Storage Management: Disk Structure, Logical and Physical View, Disk Head Scheduling, Formatting, Swap Management. Protection & Security. System Software: Definition, their types, Loader, linker, editor, Assembler, Compiler, Interpreter.

References:

1. Silberschatz and Galvin, Operating System Concepts, Addison Wesley 6/ed.
2. Modern operating Systems, A S Tanenbaum, , PHI.
3. Operating System Concepts, Peterson and Silberschatz, , Addison Wesley.
4. Operating Systems: Internals and Design Principles , William Stalling, PHI.
5. System Software ,Dhamdhare, , TMH.

MIT- 104: Data Structures and Algorithms

Unit I

Basics: Basic terminologies; introduction to basic data Structures: Arrays, linked list, trees, stack, queue, Graph; Data structure operations; Algorithm complexity: definition, types and notations .

Unit II

Stacks, Queues and Recursion: Stacks; Array representation of stack; Linked representation of stack; Various polish notation's-Prefix, Postfix, infix; Evaluation of a postfix & Prefix expression; Conversion from one another; Application of stack; Recursion; Towers of Hanoi; Implementation of recursive procedures by stacks; Queues; Linked representation of queues; Dequeues; Circular queue; Priority queue; Singly Linked list- Operation on it; Doubly linked list- Operation on it; Circular linked list.

Unit III

Trees: Binary trees; Representation of binary tree in memory; Traversing binary tree; Traversing using stack; Header nodes; Binary search trees; Searching and inserting in binary search trees; Deleting in a binary search tree; AVL search trees; Insertion and deletion in binary search trees; m-way search trees: searching, insertion, deletion; B trees: searching, insertion, deletion; Heap.

Unit IV

Algorithm Design techniques: Divide and Conquer, Greedy, Dynamic programming, back Tracking. Searching algorithm: linear search, binary search; Sorting algorithms: Bubble sort, Insertion sort, Selection sort, Quick Sort, Merge sort and Heap sort, Hashing, Hash function.

Unit- V

Graphs: Terminology & representation; Linked representation of graph; Operation on graph; Traversing a graph. Depth First Search, BFS, Warshall algorithm, Dijkstara algorithm, Minimum spanning tree; Kruskal & Prim's algorithm,

References:

1. Data Structure , Lipschutz , Mc Graw Hill.
2. Data Structures with C++", John R. Hubbard, Schaum's Outline, Tata McGraw
3. Hill.
4. Data Structure using C, AM Tanenbaum, Y Langsam and MJ Augenstein, Prentice-Hall, India
5. Data structures, Algorithms, and Applications in Java", Sahani, McGraw Hill

MIT-105: Basic Electronics and Communication

Unit I Analogue Electronics

Basic components and Circuits: R, C and L, Current and Voltage, AC and DC Fundamentals. PN junction and diode action, Rectifier: Half wave and Full wave rectifier, Uses in Power Supplies, Basics of Regulated and Switched Mode Power Supply (SMPS). Transistors: Brief introduction and applications in Amplifiers, Feed Back Amplifier, Oscillators and Operational Amplifier. Basics of Linear Integrated Circuits, Construction and working of Cathode Ray oscilloscope (CRO).

Unit II Digital Electronics – I

Number System, Conversion from one number system to another, Binary arithmetic and codes, Representation of Floating point, 1's, 2's complement and signed binary numbers. Logic gates, Boolean algebra and logic design, Karnaugh map method of simplification of logic expressions, Flip-Flops, Latches, Registers, Shift registers, Buffers and Drivers.

Unit III Digital Electronic II

Arithmetic circuits: Half-adder, Full- Adder, n-bit adder, subtraction, Multiplication of binary number, Encoders, Decoders, Code converters, Multiplexer, De-Multiplexers, Counters analogue to digital and digital to analogue converter (ADC and DAC)

Unit IV Electronic Communication

Brief description of elements of Communication Systems: Transmitter, Receiver, Communication Channel, Noise and Signals, Modems . Basic principles of Analogue and Digital Communication, Modulation techniques and types with brief introduction to Amplitude Frequency and Phase modulation, Amplitude, Frequency and Phase Shift Keying. Pulse code modulation. Concept of bandwidth, basics of microwave communication.

Unit V Selected Advanced topics

Topics like very large scale integration (VLSI) circuits, optical fibre communication, communication satellites, very small aperture terminal (V-Sat) and cellular communication .

References:

1. Principles of Linear Electronics ,A P Malvino , TMH Publishing Company
2. Electronics made simple , Henery Jacobowitz – Vakils, Feffer and Simons Pvt Ltd Bombay
3. Digital Principle and Applications , A.P. Malvino and Leech , TMH Publishing Co
4. Digital logic and Computer Design , M.Morris Mano , Pearson Education
5. Electronic communication systems , Wayne Tomasi , Pearson Education
6. Analogue communication A P Godse and U A Bakshi –,Technical publications Pune
7. Digital Communication , Harold Kolimbiris , Pearson Publications.

MIT-201: Computer Organization and Architecture

Unit- I

Register transfer language, Bus and memory transfer, Arithmetic, micro operation, Logic micro operation, Shift micro operation, Arithmetic logic shift unit

Unit- II

Instruction codes, Computer registers, Computer instructions, Timing and control, Instruction cycle, Memory reference instruction, I/O and interrupt, Design of basic computer and Accumulator logic.

Unit- III

Machine language, assembly language, Assembler programming, arithmetic and logic operation, I/O programming. Micro programmed and hardwired control unit, General register organization of C.P.U, Stack organization, Instruction format, Addressing modes, Program control, RISC v/s CISC.

Unit- IV

Parallel processing, Pipelining, Arithmetic pipelining, Instruction pipeline, RISC pipeline, Vector processing, Memory interleaving, Array processor, multiprocessor.

Unit- V

Peripheral devices, I/O interfaces, Asynchronous Data transfer DMA, Priority Interrupt, I/O processor, Multiprocessor system organization and Data communication processor. Auxiliary memory, Microcomputer, memory, Memory hierarchy, Associative memory, Virtual memory, Cache memory, Memory management hardware.

References:

1. Morris Mano "computer System Architecture",
2. Computer Organization & Architecture, W. Stallings, " , PHI.
3. Computer Architecture and Organization, J. P. Hayes, McGraw Hill,
4. Computer Architecture, A Quantitative Approach, John L. Hennessy & David A. Patterson," ,Morgan Kaufmann, .
5. Modern Computer Architecture ,Rafiquzamman and Chandra,". Galgotia Publication.

MIT-202: Data Base Management System.

Unit- I

Overview of Database Management : Data processing versus data management , File oriented approach versus database oriented approach to data management ,Data independence , Database administration, DBMS architecture, Importance of data dictionary ,Contents of data dictionary, Data Models, Object oriented database

Unit-II

Design Theory for Relational Database: E-R Model, Concept of Keys, Normalization, Functional Dependencies, Decomposition of Relation schemes, Normal Forms for Relations, Multivalued and other kinds of Dependencies.

UNIT-III

Query Optimization: Relational algebra Queries , SQL Queries ,Basic Optimization Strategies, Algebraic Manipulation, Optimization of Selections in System, Exact Optimization for a Subset of Relational Queries, Optimization under Weak Equivalence.

Unit-IV

Database Protection: Protecting the database- Integrity, Security and recovery Security in query-by-Example, Domain constraints, Referential integrity, Assertion, Triggers, Security and authorization in SQL. Concurrent Operations on the Database: Basic Concepts, A simple Transaction Model, Model with Read and Write-Locks, Read-only, Write-only Model, Concurrency for Hierarchically Structured Items, Protection against Crashes, Optimistic Concurrency Control.

UNIT-V

Principles of Distributed Data Bases: Framework for distribution. Translation of global queries into fragment queries. Query optimization and management of distributed transaction. Concurrency control and reliability in distributed databases. Administration of Distributed Data Bases.

References:

1. An Introduction to Data base Systems , C J Dates, / Kannan, Pearson Education.
2. Database system concepts By H.Korth and A. Silberschatz ,TMH Publication
3. Data Base Systems , J.D.Ullman, Galgotia, New Delhi.
4. Distributed Databases ,S.Ceri and G. Relagatti, McGraw-Hill.
5. The Theory of Database concurrency Control C.Papadimitriou , , Computer Science Press.

MIT-203: Object Oriented Programming Structures

Unit-I

Principal of OOP ,Procedure oriented Vs Object oriented, OOP paradigm, Features of OOP , Basic Data types Tokens, Keywords, Constant ,Variables, Operator I/O statements , Structure of C++ program, Arrays, pointers, Object modelling technique (OMT)

UNIT-II

Function, Object and Class, Defining class, Abstract class ,Function prototype, Function with parameter ,Passing object as a parameter, Constructor function ,Types of constructor, Destructor Friend function , Friend class, Dynamic allocation operator new and delete.

UNIT-III

Polymorphism and Inheritance ,Types of polymorphism, Constructor overloading ,Operator overloading, Template function Template class, Types of inheritance ,Private ,protected and public derivation of class ,Resolving ambiguity Pointer to object, This pointer ,Virtual class , virtual function

UNIT-IV

Input - output and File handling I/O classes ,File and stream classes ,Opening and closing file Detecting end of file, String I/O, Char I/O, Object I/O, I/O with multiple object ,File pointer, Disk I/O.

UNIT-V

Exception handling, Name spaces and Standard Template library (STL), Need of Exception handling, try, catch and throws keywords, defining namespace, benefit of namespace, Component of STL.

References:

1. Object Oriented Programming with C++ programming ,E.Balaguruswamy,Mc Graw Hill .
2. C++ Complete reference. By Herbert Schildt, Mc Graw Hill
3. Principles and Practices using C++ , Bjarne Stroustrup, Addison Wesley
4. Mastering C++ b, Venugopal , Mc Graw Hill
5. Object Oriented Programming in C++ , Robert Lafore, Galgotia Pub.

MIT-204: Data Communication and Computer Networks

Unit-I

Introduction: Goal and application Network Hardware and Software , Protocol hierarchies, Design Issue of the layers, Interfaces and services, Connection oriented and connection less services, Service Primitives, Reference Models – The OSI Reference model, The TCP/IP Reference Model ,Types of computer Network :LAN,MAN,WAN, Topologies, Transmission mode .Physical Layer: Transmission Media ,Concept of data transmission ,Switching Techniques ,Communication Satellites – Geosynchronous Satellite – VSAT, Low Orbit Satellites, ISDN and ATM. Digital Modulation and Demodulation Techniques

Unit-II

Data Link Layer: Data Link Layer design issues, Framing, Flow control, Error Detection and Correction DLL Protocol: Stop and Wait Protocol, Sliding window protocol, A Simplex protocol for noisy channel, Medium access sublayer: Channel allocation –static and dynamic ,Multiple access protocol FDDI, Data Link Layer in the Internet – SLIP,PPP.

Unit-III

Network Layer: The Network Layer Design Issue, comparison of virtual circuits and datagram subnets, connectionless internetworking, Tunnelling, Internetwork routing, Routing algorithm , Fragmentation, The Network Layer in the Internet – The IP Protocol, IP Address, subnets, Internet control protocols, internet multicasting.

Unit-IV

Transport Layer: The Transport layer services, The concept of client and server in terms of socket addressing Quality, of service, Transport service primitives and buffering, Multiplexing, Crash Recovery. The Internet Transport Protocols (TCP/IP) – The TCP Service Model, The TCP protocol, The TCP segment header, TCP connection management, TCP transmission policy, TCP congestion control, TCP timer management, UDP.

Unit-V

Presentation and Application Layer: Network Security – Traditional Cryptography, Two fundamental Cryptographic Principles, Secret Key Algorithms Public key Algorithms, Authentication protocols, DNS,E-mail.

References:

1. Computer Networks ,A.S. Tanenbaum, Pearson Education
2. Data Communications and Networking ,Forouzan, Tata McGraw Hill Company
3. Computer Network , S.S.Shinde ,New Age International Publisher.
4. Data and computer Communication , Shashi banzal ,Firewall media
5. Data & Computer communication, William Stallings, Pearson

MIT- 301: Software Engineering

Unit-I

Software Engineering Fundamentals: Software Engineering, Software Product: Software development paradigms, software Characteristics and Application. Software Development life cycle, water fall model, Prototyping, Incremental & Spiral model, 4th Generation Techniques. Project Management: Concepts, Software Process and Project Metrics; Software Measurements; Software Projects Planning: Objectives, Scope and Resources. Empirical Estimation Models: COCOMO Model, Software Equation, Project Scheduling and Tracking.

Unit-II

Software Requirement System(SRS) and Analysis: System Engineering, Product Engineering: Characteristics of a Good SRS, Requirement analysis, Principal, Software prototyping. Analysis modelling: data modelling, mechanics for structured analysis, system analysis tools and techniques, DFD, ER- Diagrams. Data Dictionary (DD), System Design: Design concept and principles and its elements, effective modular design, Cohesion & Coupling, Feature of modern graphics interface (GUI). Design Methods: data design, interface design guidelines, procedural design.

Unit-III

Software Quality Assurance(SQA): Quality and factors, Quality Assurance, Software Quality Metrics, Process and Product Quality, Capability Maturity Model (CMM). Software Quality Assurance(SQA), Need for SQA, SQA Activities, Building blocks of SQA, SQA Planning & Standards, Software Reliability, Reliability Measures. Introduction to Software Testing: Need of software(s/w) testing, Error, fault and failure. s/w Testing fundamentals, Testing objectives, test information flows, Testing lifecycle, Test Cases.

Unit-IV

Levels of Testing: Unit Testing, Integration Testing, System Testing, Acceptance Testing, Alpha testing & Beta testing, Static vs. Dynamic testing, Manual vs. Automatic testing, Different types of Testing: Installation Testing, Usability testing, Regression testing, Performance testing, Load testing, stress testing, Security testing, Static & Dynamic testing, Static testing techniques, Review types : Informal Review, Technical or peer review, Walkthrough, Inspection, static analysis, Review meeting and reporting , Review guidelines & Review checklist, Data flow analysis, Control flow analysis, Cyclometric Analysis, Dynamic testing – need & Advantages

Unit-V

Black Box & White Box Testing (Test Case Design Techniques):Functional Testing (Black Box), Equivalence partitioning, BVA, Decision table based testing, Cause-Effect graphing, Syntax testing (Concept & Test case generation only), Structural Testing (White Box), Coverage testing, Statement coverage, Branch & decision coverage, Path coverage, Validation testing Activities, Low level testing, High level testing, Black box Vs. White Box

References:

1. Software Engineering – A Practitioners Approach Roger S. Pressman, Mcgraw Hill, International Education.
2. An Integrated Approach To software Engineering, Pankaj Jolote, ,Narosa
3. Software Engineering – A Programming Approach, D. Belie I. Moray, J. Rough, PHI.
4. Software Testing Techniques, Barrios Bier, Van N Ostrand Reinhold.
5. Software Engineering Concepts-Richard Fairley, CDAC. Tata McGraw-Hill Series.

MIT 302 Formal Languages and Automata Theory

Unit- I

Introduction to theory of computation: Significance of theoretical computer science, Mathematical model of computer and programming languages, Automata, historical aspect of automata, application of Automata theory. Mathematical preliminaries & Notation: Sets, Cartesian product (cross product of two sets), various operations on sets, Relation and Functions, Graphs and Trees.

Unit- II

Basics of Languages: Informal & formal definitions. Alphabets, Strings, Languages, Grammar, automata and other related definitions, various operation on languages: - union, concatenation, negation, reverse, star closure, Positive closure properties. Grammar: Informal and formal definitions. Illustrations for generating grammar for various languages

Unit- III

Finite Automata: Components of Automata, types of Automata, Deterministic Automata, Non- Deterministic Automata, Representation of Finite Automata, Deterministic Finite Automata (DFA), Representation of Deterministic Finite Automata using Transition Graphs, Transition diagraphs, Transition Tables, Languages generated by Deterministic Automata.

Unit- IV

Regular Languages: Definition of Regular Languages, Application of Finite Automata, Non-Deterministic Finite Automata (NFA): Definition of Non- Deterministic Automata, Properties of Transitive function, λ -NFA, Conversion of NFA to DFA. Finite Automata with λ -transition, λ -Closure, λ -NFA. Regular Expression : Formal Definition of Regular Expression, Languages Associated with Regular Language. Relationship between Regular Expression and Regular Language. Conversion of Regular Expression to λ -NFA, Conversion of Finite Automata (DFA or NFA) to Regular Expression (Kleen's theorem).

Unit- V

Types of grammars, Classification of Chomsky Hierarchy, Phase structured grammars, context free grammar, context sensitive grimmer, regular grammar. Pushdown Automata: Definition and Representation of Pushdown automata, Non Deterministic Pushdown automata, operations on Pushdown automata. Turing machine: Basic Model, definition and representation of Turing Machine. Application of Turing Machine.

References:

1. Introduction to Automata Theory, Languages and Computation, J. E. Hopcroft and J. D. Ullman and Rajeev Motwani: Pearson Education Asia
2. Elements of the Theory of Computation, H. R. Lewis and C. H. Papadimitriou: Pearson education asia.
3. Introduction to languages and the Theory of Computation , J. C. Martin, Tata Mc-Graw Hill
4. Introduction Formal Languages and Automata , Peter Linz, Narosa,.
5. Theory of Computer Science: Automata, Language and Computation, M. Chandrasekaran, and K.L.P. Mishra: Prentice Hall of India .

MIT-303 Introduction to JAVA

Unit-I

Overview of JAVA: The genesis of java, An overview of java, java virtual machine (JVM) ,Java development kit(JDK) ,Java Vs C++, Data types, Literals, Variables, and Arrays, Operators, Control statements, Introducing Class, closer look at Methods and class ,Nested and inner class , String handling ,Constructor ,Garbage collection and finalize() method.

Unit-II

Inheritance, Packages and interface-Types of inheritance ,Access specifiers class inheritance, using super, method overriding ,Abstract class ,constructor in multilevel inheritance ,using final with inheritance ,Dynamic method dispatch, Defining package, CLASSPATH, Access protection ,Importing package ,Defining and implementing interface, Extending interface, Nested interface.

Unit-III

Exception handling and Using try and catch ,multiple catch classes, Nested try statements , throw throws and finally ,Built in exception ,Uncaught exception , Creating own exception class . Multithreading: Java Thread Model – Main thread, Creating own Thread, Life cycle of thread, Thread priorities ,Synchronization and messaging , communication ,Suspending ,Resuming and stopping thread.

Unit-IV

Input Output: Byte stream and character stream, Predefined stream, reading console input, writing console output, Print Writer class, Reading and writing files

Unit- V

Applet , AWT and Event handling – Applet life cycle, Creating an applet, Using image and sound in applet ,passing parameter. AWT- Overview of java.awt package, Component and Containers, control component and layout manager Event handling –The delegation-event model, Event classes, Source of event, Event listener interfaces, handling mouse and keyboard event, Adapter class.

References:

1. Java: The complete reference, Naughton P and schildt H., TMH Publication.
2. Simply JAVA :An Introduction to JAVA programming , James R. Levenick ,Firewall Media Publication New,Delhi
3. Java Programming, Balguruswami , Mc Graw Hill.
4. Core JAVA for beginners ,RashmiKantaDas ,Vikas Publication.
5. Core Java , Horstmen, Pearson.

MIT 304 Visual Language Programming

Unit I

Introduction to .Net Framework, Pre Microsoft.Net days, Microsoft.net, .Net Architecture and framework, VB.Net as Programming language.

Unit II

VB.Net Language Fundamentals, Data Types, constant and variable declarations, Operators, Built in methods ,Decision structures, Loops, Arrays manipulation in VB.Net, MDI and SDI, Dynamic Programming in VB.Net , Using Modules and Procedures .

Unit III

Menu and Dialog controls in VB.Net, Menu bar implementation In VB.Net, OpenFileDialog, SaveFileDialog, Colordialog, Font Dialog, Input and Output Using Stream Reader and stream Writer.

Unit IV

Common Controls and Application Development in VB.Net, Performing File input / output operations, implementing Multi threading, Exception Handling.

Unit V

Data Access with ADO.Net: Database Access Using Wizard, Database Access Using Code, On-Line Connection, Off-Line connection, Understanding the role of Dataset, Data Adapter, Datareader, NonExecutequery, Execute scalar, Minor Project development.

References:

1. Beginning VB .Net , Richard Blair, Matthew Reynolds, Jonathan Crossland, Wrox Publications.
2. Applied Microsoft .Net Frame Work Programming, Jeffrey Richter, Microsoft Press.
3. Microsoft.Net for Programmers, Fergal Grimes, Microsoft Press.
4. Understanding the .Net Frame work, TonyBaer, Kent Tegels, Wrox Publications.
5. Visual Basic. Net Programming , Steven Holzner. Paraglyph press

MIT 401 Computer Graphics

Unit -I

Overview of Graphics Systems: Video Display Devices , Refresh cathode ray tubes, Refresh scan displays, Random scan displays, color CRT Monitors, DVST, Flat- Panel displays, Three Dimensional viewing devices, Raster scan systems, Input Devices: Keyboards, Mouse, Track ball, Joysticks, Data Glove, Touch Panels, Light pens.

UNIT –II

Curves and Surfaces:Line Drawing Algorithm, DDA Algorithm, Bresenham's Line Drawing Algorithm, Bresenham's Circle Drawing Algorithm, Ellipse Drawing Algorithm, Pixel Addressing and object geometry: Screen Grid coordinates, Maintaning Goemetry properties of Displayed objects.

UNIT –III

Geometric Transformation:Homogeneous Coordinate System for 2D and 3D, Various 2D, 3D Transformation matrices (Translation, Scaling, Rotation, Shear), Rotation about an arbitrary point (2D), Rotation about an arbitrary axis (3D), Computing location of V.P, Clipping Algorithms, Sutherland-Cohen Clipping Algorithm.

UNIT-IV

Curves and Visible Surface Detection Methods: Bezier Curves, 4 point and 5 point Bezier curves using Bernstein Polynomials, B-Spline Curves, Computing control points given end slopes for a specified curve segment. Back Face Detection, Depth Buffer (Z-Buffer, A-Buffer) Method, Scan Line Method, Depth Sorting Method, Area Subdivision Method.

UNIT –V

Illumination Model and Surface Rendering: Basic Illumination models, shading models for curve surfaces, Half tone Pattern and Dithering Techniques, Rendering, Color Models: XYZ Color Model, RGB, YIQ, CMY, HSV, HLS.

References:

1. Computer Graphics, D. Hearn and P. Baker, Prentice Hall.
2. Computer Graphics, R. Plastock and Z.Xiang, Schaum's Series, McGraw Hill.
3. Computer Graphics Principles & Practice, Foley et. al., Addison Wesley.
4. Procedural Elements for Computer Graphics, David F. Rogers, McGraw Hill.
5. Principles of Interactive Computer Graphics, W. Newman and R. Sproul, McGraw-Hill.

Electives

Web Design and Development

UNIT-I:

Basic web designing: Introduction to web browser, architecture of web browser, web page, static & dynamic web pages, home page, web-site. Web-servers & clients. www. Introduction to HTML: History, structure of HTML document, creating & executing HTML. Tags of HTML. Tables and Frames:Creating Table with <TABLE> tag,,spanning cells with rowspan, colspan attributes. <FRAMESET>&<FRAME> tag, it's attributes, using nested <frameset>tag, Inline frame.

UNIT II

Forms and CSS:Understanding Form, <FORM> tag, creating text boxes, buttons, checkboxes, radio buttons, hidden control, password, lists & dropdown list,textarea. Submitting a form, get & post method. Creating CSS, applying CSS toHTML documents. Use of <META> Tag. Event Handling & Form Validation: onClick, onChange, onLoad, onSelect, onSubmit, onMouseOver, onFocus, onBlur, Validation of text box entries, checkboxes, radio buttons, e-mail address validation, date validation.

UNIT III

C#.NET : Features, Data Types ,Variables, Arrays, Namespaces, Enumeration, Operators, Control flow structures, Arrays manipulation in C#.Net, MDI and SDI, Dynamic programming in C#.Net, Using Modules and Procedures ,Object Oriented Concepts & features, Class, Object, Data Binding

UNIT-IV

Creating WEB Application: ASP.NET Tools, Advanced Tools & Features, User Interface, Creating Master Pages, Creating Web Pages, User Controls, Data Binding Controls, Query String, and Session State.

UNIT-V:

Data Access with ADO.Net: Database Access Using Wizard, Database Access Using Code, On-Line Connection, Off-Line connection, Understanding the role of Dataset, Data Adapter, Datareader, NonExecutequery, Execute scalar, creating connections , connecting to SQL server , connection to MS-Access, closing an open connection, Executing SQL statements with connection object –creating, inserting, updating, deleting database table.

References:

1. HTML 4.0, E. Stephen Mac, J. Platt, bpb
2. Completer Reference HTML - Thomas A. Powell ,TMH
3. Applied Microsoft .Net Frame Work Programming, Jeffrey Richter, Microsoft Press.
4. Microsoft.Net for Programmers, Fergal Grimes, Microsoft Press.
5. Teach yourself ASP programming in 21 days – Fleet, Warret, Hen Stojanovic , Techmedia.

Artificial Intelligence

Unit-I

Introduction, AI problems, foundation of AI and history of AI intelligent agents: Agents and Environments, the concept of rationality, the nature of environments, structure of agents, problem solving agents, and problem formulation.

Unit-II

Searching for solutions, uniformed search strategies – Breadth first search, depth first search, Depth limited search, Iterative-deepening depth first search bi-direction search - comparison. Search with partial information (Heuristic search) Greedy best first search, A* search, Memory bounded heuristic search, Heuristic functions. Local search Algorithms: Hill climbing, simulated, annealing search, local beam search, genetical algorithms. Constrain satisfaction problems: Backtracking search for CSPs local search for constraint satisfaction problems.

Unit-III

Game Playing: Adversial search, Games, minimax, algorithm, optimal decisions in multiplayer games, Alpha-Beta pruning, Evaluation functions, cutting of search., Knowledge representation Reasoning and Agents :knowledge – Based Agents, the Wumpus world, logic, propositional logic, Resolution patterns in propos ional logic, Resolution, Forward & Backward. Chaining. First order logic. Inference in first order logic, propositional Vs. first order inference, unification & lifts forward chaining, Backward chaining, Resolution.

Unit-IV

Planning: Classical planning problem, Language of planning problems, Expressiveness and extension, planning with state – space search, Forward states spare search, Backward states space search, Heuristics for stats space search. Planning search, planning with state space search, partial order planning Graphs.

Unit-V

Learning :Forms of learning, Induction learning, Learning Decision Tree, Statistical learning methods, learning with complex data, learning with Hidden variables – The EM Algorithm, Instance Based learning, Neural Networks.

Refrences :

1. Introduction to Artificial Intelligence – Rajendra Akerkar, PHI.
2. Artificial Intelligence – A Modern Approach. Second Edition, Stuart Russel, Peter Norvig, PHI/Pearson Education.
3. Artificial Intelligence, 3rd Edition, Patrick Henry Winston., Pearson Edition,
4. Artificial Intelligence and Expert Systems – Patterson PHI
5. Expert Systems: Principles and Programming- Fourth Edn, Giarrantana/ Riley, Thomson

Network Security

UNIT-I:

Introduction, Security Concepts, Threats and Risks, Attacks – Passive and Active, Security Services, Confidentiality, Authentication, Non-Repudiation, Integrity, Access Control, Availability.

UNIT-II:

Access Control Models, Bell-LaPadula, Non-Interference and Role Base Model. Cryptography, Secret Key and Public Key Cryptosystems, Symmetric Ciphers, Block Ciphers and Stream Ciphers, DES, Triple DES, RSA.

UNIT-III:

Secure Hash and Key management, Digital Signature and Non-repudiation, cryptanalysis. Network Security, Objectives and Architectures, Internet Security Protocols, IP encapsulating Security Protocol, Network and Transport Layer Security

UNIT-IV:

Network Security Applications, Authentication Mechanisms: a) Passwords, b) Cryptographic authentication protocol, c) Smart Card, d) Biometrics, e) Digital Signatures and seals, f) Kerberos, g) X.509 LDAP Directory. Web Security :SSL

UNIT-V:

E-mail Security, PGP / MIME, IP Security, Access and System Security, Intruders, Intrusion Detection and Prevention, Firewall a) Hardware Firewall b) Software Firewall c) Application Firewall d) Packet Filtering. e). Packet Analysis, Proxy Servers, Firewall setting in Proxy, ACL in Proxy

References :

1. Network Security Essentials, William Stallings, Prentice-Hall.
2. Fundamentals of Computer Security Technology, Edward Amoroso, Prentice-Hall.
3. Cryptography and Data Security, Dorothy E. Denning, Addison-Wesley.
4. Computers under Attack, Peter J. Denning, Addison-Wesley.
5. Cryptography: Theory and Practice, Douglas R. Stinson, CRC Press.

Distributed Computing

Unit-I

Distributed Computing-introduction, history; Distributed Computing system: Strength and weaknesses, Different forms of Computing: Minicomputer model, workstation model, workstation server model, Cluster:-definitions,cluster computer system architecture, Windows cluster, distributed Computing System models: Distributed operating system, Introduction to DCE, architecture of Distributed Applications,. Frameworks, and component, Message passing:- Features, Issues in IPC by Message passing, synchronization.

Unit II

Group Communication: Unicasting versus multicasting, Multicast API, Connectionless versus connection oriented Multicast Reliable multicast versus unreliable multicast API, Reliable multicast API, Ordering and their implementation: Absolute, causal, Consistent Distributed Computing Paradigms, Client-server paradigm, Peer to Peer paradigm. Message system paradigm Remote Procedure call model, Network services Paradigm.

Unit-III

Remote Procedure Calls(RPC): Introduction, RPC model its transparency, implementation, stub generation, RPC messages, Marshalling Arguments and result, server management Call semantics, Communication protocols for RPCs, Complicated RPCs, client server binding special RPCs, RPC in heterogeneous environment, Light weight RPC, Datagram Socket API, Stream mode Socket API, sockets with non blocking I/O Operations Secure Socket API Client server paradigm issues, software engineering issues for a network service, Connection Oriented and connectionless Servers Iterative servers and concurrent server, stateful servers

Unit IV

Synchronization :Mutual exclusion, deadlock, election algorithm, Resource Management: Introduction, desirable features of a good global scheduling algorithm, task assignment approach, load balancing approach, Load sharing approach; Process management: introduction, Process migration, threads

Unit V

Distributed file system: introduction, desirable features of a good DFS, file models, File accessing models, file sharing semantics, file caching semantics, file replication, fault tolerance, atomic transaction, design principles, Distributed object: Message passing versus distributed objects, distributed object architecture, distributed object system, RPC, remote method invocation, RMI architecture API for RMI,RMI application, comparison of RMI and socket API, Client Call back, Stub downloading, RMI security manager

References:

1. Distributed Computing Principles and Application,M.L.Liu, Pearson Education
2. Distributed Computing : Concepts and Application, M L Liu, Addison Wesley
3. Distributed Operating system, Pradeep k Singha,PHI
4. Distributed System Concepts and design, Couloouris, Pearson education
5. Distributed System, Principles and paradigm , Tanenbaum,PHI

E- Commerce

Unit I

An introduction to Electronic commerce, E-Commerce (Introduction And Definition), activities of E-Commerce, Goals of E-Commerce, Technical Components of E-Commerce, Functions of E-Commerce, Advantages and disadvantages of E-Commerce, Scope of E-Commerce, Electronic Commerce Applications, Electronic Commerce and Electronic Business(C2C)(2G,G2G, B2G, B2P, B2A, P2P, B2A, C2A, B2B, B2C).

Unit II

The Internet and WWW, Evolution of Internet, Domain Names and Internet Organization (.edu,.com, .mil,.gov, .net etc.), Types of Network, Internet Service Provider, World Wide Web

Unit III

Internet and Security: Internet and Extranet, Definition of Internet, Advantages and Disadvantages of the Internet, Development of a Intranet, Extranet and Intranet Difference, Role of Internet in B2B Application, Secure Transaction, Computer Monitoring, Privacy on Internet, Corporate , Email privacy, Computer Crime(Laws , Types of Crimes), Threats, Attack on Computer System, Software Packages for privacy, Hacking, Computer Virus.

Unit IV

Encryption and Decryption, Secret key Cryptography, DES, Public Key Encryption, RSA, Authorisation and Authentication, Firewall, Digital Signature. Electronic Data Exchange : Introduction, Concepts of EDI and Limitation, Applications of EDI, Disadvantages of EDI, EDI model. Electronic Payment System: Introduction,

Unit V

Electronic Payment System: Types of Electronic Payment System, Payment Type, Traditional Payment, Value Exchange System, Credit Card System, Electronic Fund Transfer, Paperless bill, Modern Payment Cash, Electronic Cash, E – Governance for India: E – Governance of India, Indian customer EDI System, Imports, Exports

References :

1. E-Commerce Concepts, Models, Strategies- :- G.S.V.Murthy Himalaya Publishing House
2. E- Commerce Technology and Management, Kamlesh K Bajaj and Debjani Nag, Mc Graw Hill
3. Electronic commerce :- Gray P. Schneider , Wiley
4. e-Business Essentials : Successful e-Business Practices - From the Experts at PC Magazine, Frank J. Derfler, Pearson.
5. Building E-Commerce Sites With . Net Framework, Bentrum, Pearson.

Compiler Design

Unit

I

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- The role of the parser-Context-free grammars-Writing a grammar-Topdown 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 languages-Declarations-Assignment statements - Boolean expressions- Case statements-Backpatching-Procedure calls

Unit IV

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 codegenerator-Register allocation and assignment-The dag representation of basic blocks - Generating code from DAG.

Unit V

Introduction-The principle sources of optimization-Peephole optimization- Optimization of basic blocks-Loops in flow graphs- Introduction to global data-flow analysis-Code improving transformations.

References:

1. Compilers- Principles, Techniques, and Tools”, Alfred V. Aho, Ravi Sethi Jeffrey D. Ullman, , Pearson Education Asia,
2. Modern Compiler Design, David Galles, Pearson Education Asia.
3. Advanced Compiler Design & Implementation, Steven S. Muchnick, Morgan Kaufmann Pulishers,.
4. Crafting a Compiler with C, C. N. Fisher and R. J. LeBlanc “, Pearson Education.
5. Modern Compiler Design, Galles, Pearson.

Object Oriented Analysis and Design

Unit-I

Object Oriented Methodology: Object model - Elements-Class and object - Nature of object/class-Relationship among Object-Relationship among classes-Quality classes and objects - Classification-Classical categorization - Conceptual clustering - prototype theory - Analysis and design .

Unit-II

Unified Modeling Language(UML): Introduction, Model, Use case - usage-class diagrams - Perspectives - Association - Attributes - Operation -CRC cards-Usage -Interaction diagram-Sequence diagrams-Collaboration diagrams-Package diagrams-Concurrent state diagrams-Activity diagrams-Decomposition and activity.

Unit-III

Object and Responsibility Identification: Object Oriented model, traditional techniques-Current techniques-Approach to identify attribute- Service-Method.

Unit-IV

Behaviour Specification: Static behaviour specification techniques-Control-Documenting control-Documenting static behaviour -Dynamic behaviour identification-Specification techniques-Documenting Event specifications-Identifying relationships.

Unit-V

UML and Programming :Domain model-specification model-System design-Detailed design-Coding.

References:

1. UML distilled-Applying the standard object modelling language, Martin Fowler, Kendall Scott., Addison Wesley.
2. "UML and C++ - A practical guide to object oriented development ,Richard C lee, William M Tepfenhart, Prentice Hall.
3. Object Oriented Analysis and design with applications, Grady Booch, ", Addison Wesley.
4. Object Oriented Methods-A foundation , James martin & James J.Odell, Prentice Hall.
5. Object-Oriented Analysis and Design, John Deacon, Addison-Wesley,

Bioinformatics

Unit-I

Introduction: genomes - diversity size and structure - proteins proteomes - Information Content in Biological sequences - Prediction of molecular function and structure.

Unit-II

Internet resources and public data bases:databases and tools -sequence similarity searches - Alignment - Prediction software - Molecular Biology Software - blast-fast-blosum.

Unit-III

Sequence Comparison in Biology: global alignment - local alignment - gaps Multiple sequence comparison - Multiple alignment to Phylogenetic trees.

Unit-III

Maps Mapping and Sequencing :DNA mapping and sequencing problems - Mapping and genome project - Large-scale sequencing and sequence assembly - shotgun sequencing.

Unit-IV

Clones And Evolutionary Trees: Ultra metric Trees and distances - Maximum parsimony - cladistic trees - phylogenetic alignment.

Unit-V

SPECIAL TOPICS IN BIOINFORMATION: Molecular computing - Gene prediction.

References:

1. Bioinformatics : Tools and Applications , Edwards, David; Stajich, Jason; Hansen, David (Eds.)
2. Bioinformatics. Sequence and Genome Analysis Mount D.W. , Cold Spring Harbor, New York.
3. Bioinformatics: A practical guide to the analysis of genes and proteins, John Wiley & Sons, New York.
4. Introduction to Bioinformatics ,Attwood T.K. Smith D.J. Parry:, Addison Wesley .
5. Bioinformatics: sequence structure and data banks , Higgins Des, Taylor, ,Oxford Univ. Press, Oxford

Pattern Recognition

Unit-I

Introduction: Pattern and feature-Training and learning in Pattern recognition approaches-Statistical pattern recognition-Syntactic pattern recognition-Neural pattern recognition-Reasoning driven pattern recognition-Discriminant functions-Linear and Fisher's discriminant functions

Unit-II

Statistical Pattern Recognition: Gaussian model-Supervised learning-Parametric estimation-Maximum likelihood estimation-Bayesian parameters estimation-Perception algorithm-LMSE algorithm-Problems with Bayes approach-Pattern classification by distance functions-Maximum distance pattern classifier

Unit-III

Cluster Analysis: Unsupervised learning-Clustering for Unsupervised learning and classification-C-means algorithm-Hierarchical procedures-Graph theoretic approach to pattern clustering-Validity of clustering solutions

Unit-IV

Syntactic Pattern Recognition: Elements of formal grammar-String generation as pattern description-Recognition of syntactic description- Parsing-Stochastic grammar and applications-Graph based structural representation

Unit-V

Feature Extension And Recent Advances: Entropy minimisation-Karhunen-Loeve transformation-Neural Network structures for pattern recognition-Unsupervised learning -self organising networks-Fuzzy pattern classifiers-Genetic algorithms-Application to pattern recognition

References:

1. Pattern Recognition and Image Analysis Richard, E.G., Johnsonbaugh and Jost .S., Prentice Hall of India Private Ltd.
2. Pattern classification and Scene analysis: Duda R.O. and Hart P.E., Wiley
3. Pattern Recognition Engineering ,Morton Nadler and Eric Smith p, John Wiley and Sons.
4. Pattern Recognition Principles ,Tou and Gonzaler R., Addison Wesley.
5. Pattern Recognition:Statistical and Neural Approaches , Robert J. Schalkoff, " ",John Wesley

Multimedia Database Systems

Unit-I

Introduction To Multimedia Databases:Types of multimedia information, multimedia database applications, characteristics of multimedia object, components of a multimedia database management system.

Unit-II

Multimedia Storage And Retrieval :Image database, text/document database, video database, audio databases, retrieving multimedia data from disks/cd-rom/tapes.

Unit-III

Multimedia Information Modeling :Data analysis, data structuring and accessing, examples of multimedia Structures, Metadata for multimedia, multimedia data access, object-oriented models, temporal models, models and multimedia authoring, relevant data structures (k-D trees, point quadtrees, the MX-quadtrees, r-trees, etc.).

Unit-IV

Querying Multimedia Databases : Operations on multimedia data, Query processing and query languages .

Unit-V

MultiMedia DBMS (MMDBMS) Architecture :Distributed MMDBMS architecture, client-server components, implementation considerations, creating Distributed Multimedia Presentations.

References:

1. Principles of Multimedia Database Systems, V.S. Subrahmanian, , Morgan Kaufmann Publishers.
2. Multimedia Database Management Systems, B.Prabakaran, , Kluwer Academic Publishers, 1997.
3. Modern Database Systems. W.Kim, , Addison-Wesley.
4. Multimedia, computing, communications and applications Ralf Steinmetz, Klara Nahrstedt, , Prentice Hall.

Soft Computing

Unit- I

Introduction :Soft computing paradigms - Neural network - Fuzzy logic - Derivation free optimization methods of genetic algorithms - Soft computing characteristics.

Unit-II

Fuzzy Logic: Sets - properties - Arithmetics - Members function - Fuzzy relations - Relation equations - Fuzzy measures - Types of uncertainty - Members of uncertainties - Measures of fuzziness - Probabilities Vs Possibility - Measures of fuzzy events.

Unit-III

Neural Computing: Neuron modeling - learning in simple neuron - Perception learning curve - Proof - Limitations of perception

Unit-IV

Neural Networks :Multi-level perception - Algorithm - Visualizing network behaviour - Self organizing network -Kohonen algorithm - Hopfield network - Adaptive resonance theory - Pattern classification.

Unit-V

Genetic Algorithms :Introduction - Biological terminology - Search space and fitness landscapes - Elements of genetic algorithms - Genetic algorithms in problem solving.

References:

1. Theory of Fuzzy subsets, Kauffman a, Academic Press.
2. Neural Computing - An Introduction ,R.BealeC.T.Jacson, Adam Hilge.
3. An Introduction to Genetic Algorithms, Melanie Mitchell, PHI.
4. Neuro - Fuzzy and Soft Computing , JS Jang, C.T.Sun, E.Mizutani, , MatlabCurriculum series, Prentice International.
5. Neural Networks-A Comprehensive foundation ,Simon Haykin, Prentice Hall of India.

Embedded Systems

Unit-I

Embedded system:- Definition, components, I/O, Processor, Memory, Characteristics, attributes, design metrics, design challenges, application areas, Issues of designing efficient Embedded system, Difference between ES and PC, Design Technology, Integration and Testing of Embedded Hardware and Firmware, Embedded System Development Environment:-IDE, compiler, assembler, simulator, Emulator, debugging, Target hardware debugging and Boundary Scan, EDLC, Trends in the Embedded Industry:-Processor trends, OS trends, Development languages trends, Open Standard and framework. S/W H/W Co-design.

Unit-II

Microcontroller:-Introduction, criteria for choosing a microcontroller, Overview of 8051 Microcontroller family: Architecture, basic assembly language programming concepts, Memory Organization of 8051, SFR, Addressing Modes, Instruction set including bit manipulating instruction and programming using it, Subroutine, Stack, Time delay generations and calculations, I/O port programming, Programming of 8051 Timers, Counter Programming. Watch Dog Timer, Real Time clock.

Unit -III

8051 hardware connections, basics of Communication with 8051, Basics of Communication, Overview of RS-232, I²C Bus, UART, USB, 8051 connections to RS-232, 8051 serial communication programming, 8051 interrupts, Programming of timer interrupts, Programming of External hardware interrupts, Programming of the serial communication interrupts, Interrupt priority in the 8051

Unit-IV

Basic Concepts of Interfacing, Introduction 8051 Interfacing to an external memory and Accessing External data Memory and External Code Memory, Interfacing to LCD/Keyboard, DAC/ADC, Sensors, a Stepper Motor, Interfacing with 8255

Unit-V

Real-Time Operating Systems: Review of Concepts, Basic Concepts, Types of RTOS, RTOS Issues, Implementing of RTOS, Distributed Processing Systems-Networking with mCAN: Design Approaches, CAN protocol, RTOS:- introduction, type, overview of commercially available RTOS, Introduction to ES design using RTOS.

References:

1. Introduction to Embedded Systems, Shibu K V, TMH.
2. Embedded System Design, Frank Vahid & Tony Givargis, John Wiley & sons.
3. "The 8051 Microcontroller and Embedded Systems", M.A. Mazidi and J. G. Mazidi, PHI.
4. An Embedded Software Primer, David E. Simon, Pearson Education.
5. "Embedded Systems", Raj Kamal, TMH.

Mobile Computing

UNIT – I

Introduction to Personal Communications Services (PCS): PCS Architecture, Mobility management, Networks signalling. Global System for Mobile Communication (GSM) system overview: GSM Architecture, Mobility management, Network signalling, Performance Analysis: Admission control and handoffs

UNIT – II

2.5/3G Mobile Wireless systems: packet switched Data ,Introduction, 3G CDMA cellular standards, Wideband Code Division Multiple Access (W-CDMA), and CDMA 2000, Quality of services in 3G. 2.5/3G TDMA: General Packet Radio Services (GRPS) and EDGE.

UNIT – III

Access Scheduling techniques in cellular systems Slotted Aloha access, integrated access: voice and data, scheduling in packet based cellular systems. Mobile Data Communication: WLANs (Wireless LANs) IEEE 802.11 standard, Mobile IP.

UNIT – IV

Wireless Application Protocol (WAP): The Mobile Internet standard, WAP Gateway and Protocols, wireless mark up Languages (WML).

Unit- V

Wireless Local Loop(WLL): Introduction to WLL Architecture, wireless Local Loop Technologies. Global Mobile Satellite Systems; case studies of the IRIDIUM and GLOBALSTAR systems.

References

1. Yi-Bing and Imrich Chlamtac, “Wireless and Mobile Networks Architectures”, John Wiley & Sons, 2001.
2. Raj Pandya, “Mobile and Personal Communication Systems and Services”, PHI, 2001
3. Mischa Schwartz, “Mobile Wireless Communications”, Cambridge University Press, UK, 2005.
4. Mark Ciampa, “Guide to Designing and Implementing wireless LANs”, Thomson learning, Vikas Publishing House, 2001.

Data Mining

UNIT I

Introduction, Data Warehouse, Multidimensional Data Model, Data Warehouse Architecture, Implementation, Further Development, Data Warehousing to Data Mining

UNIT II

Pre-processing, Cleaning, Integration, Transformation, Reduction, Discretization, Concept Hierarchy Generation, Data Mining Primitives, Query Language, Graphical User Interfaces, Architectures, Concept Description, Data Generalization, Characterizations, Class Comparisons, Descriptive Statistical Measures.

UNIT III

Association Rule Mining, Single-Dimensional Boolean Association Rules from Transactional Databases, Multi-Level Association Rules from Transaction Databases

UNIT IV

Classification and Prediction, Issues, Decision Tree Induction, Bayesian Classification, Association Rule Based, Other Classification Methods, Prediction, Classifier Accuracy, Cluster Analysis, Types of data, Categorisation of methods, Partitioning methods, Outlier Analysis.

UNIT V

Multidimensional Analysis and Descriptive Mining of Complex Data Objects, Spatial Databases, Multimedia Databases, Time Series and Sequence Data, Text Databases, World Wide Web, Applications and Trends in Data Mining

References:

1. Data Mining: Concepts and Techniques, J.Han, M.Kamber, Academic Press, Morgan Kaufman Publishers.
2. Data Mining, Pieter Adrians, DolfZantinge, Addison Wesley.
3. Data Mining with Microsoft SQL Server, Seidman, Prentice Hall of India.
4. Mastering Data Mining: The Art and Science of Customer Relationship Management, Berry and Linoff, John Wiley and Sons.
5. Data Ware housing: Concepts, Techniques, Products and Applications, C.S.R. Prabhu, Prentice Hall of India.