BVSD 3.1: Computer Networks

Unit 1

Communication System, Concept and Terminology, Analog and Digital Transmission, Half-Duplex and Full-Duplex, Analog Modulation (AM, FM, PM), Modulation of Digital data (ASK, FSK, PSK), Signals, Attenuation, Delay Distortion and Noise, Synchronous and Asynchronous Transmission.

Unit II

Guided and Unguided Media, Transmission Characteristics of Media, Channel Capacity, Switching, Multiplexing, FDM and TDM, Multiplexing, Topology (Ring, Star, Bus, Tree, Mesh).

Unit III

LAN, MAN, WAN, Wireless Network, Internet, Distributed Networking, Client-Server Architecture, WWW.Layered Architecture, Protocol Hierarchies, Interface and Services, OSI Reference Model, TCP/IP Reference Model.

Unit IV

Introduction to Security, SSL, Cryptography, Public Key, Private Key, Digital Signature.

Recommended Texts:

1. Data and Computer Communication: Stallings (Pearson Education)
2. Computer Networks: Tanenbaum, Wetherall and Pearson (Pearson Education)
3. Internetworking TCP/IP-Principles, Practices and Architecture: Comer (Prentice Hall)
4. Local Area Network: Basandra and Jaiswal (Galgotia)
5. Data Communications and Networking: Behrouz Forouzan (McGraw Hill)
6. Telecommunication and the Computer: James Martin (PHI)
7. Data Communications, Computer Networks and OSI: Fred Halsall (Addison-Wesley)

BVSD 3.2: Operating Systems

Unit I

Definition and Types of Operating Systems; Batch Processing Systems, Multi programming, Time–Sharing, Parallel, Distributedand Real-Time Systems; Operating System Structure; Operating System Components and Services, System Calls, System Programs, Virtual Machines.

Unit II

The Critical-Section Problem, Synchronization, Semaphores, Classical Problems of Synchronization, Critical Regions, Monitors, Deadlocks-System Model, Characterization, Deadlock Prevention, Avoidance and Detection, Recovery from Deadlock, Combined Approach To Deadlock Handling.

Unit III

Memory Management: Background, Logical versus Physical Address Space, Swapping, Contiguous allocation, Paging, Segmentation Virtual Memory: Demand Paging, Page Replacement, Page- replacement Algorithms, Performance of Demand Paging, Allocation of Frames, Thrashing.Concept of File System, General Model of a File System, Access Control Verification, Logical and Physical File System, Access Methods, Directory Structure, Protection, File System Structure, Allocation Methods, Free- Space Management

Unit IV

Techniques for Device Management, Shared Devices, Virtual Devices, Storage Devices, Buffering, Secondary Storage Structure: Disk Structure, Disk Scheduling, Disk Management, Swap- Space Management, Disk Reliability

Recommended Texts:

1. Operating System Concepts: Silbersachatz and Galvin(Person)
2. OperatingSystems: Madnick& Donovan (Tata McGraw Hill)
3. ModernOperating Systems: Tanenbaum (PHI)
4. Operating Systems Design and Implementation: Tanenbaum and Woodhull (PHI)
5. Operating Systems Principles: Silbersachatz , Galvin, and Gagne (John Wiley & Sons)
6. Operating Systems: A Modern Approach: Gary Nutt (Addison-Wesley)

BVSD 3.3: Data Structures Using C

Unit I

Representation of Single and Multidimensional Arrays; SparseArrays– Lower and Upper Triangular Matrices and Tridiagonal Space Matrices with Vector Representation.

Unit II

Stack, Queues, Singly Linked List, Doubly Linked List, Circular Linked Lists, Implementing Pointers and Objects, Representing Rooted Trees.

Unit III

Heap Sort, Quick Sort, Counting Sort, Radix Sort, Bucket Sort, Median and Order Statistics.

Unit IV

Introduction and Terminology; Traversal of Binary Trees; Recursive Algorithms for Tree Operations such As Traversal, Insertion, Deletion; Binary Search Tree; B-Tree; Indexing with Binary Search Trees.Direct Address Tables, Hash Tables, Hash Functions, Open Addressing.

Recommended Texts:

1. Fundamentals of Data structures Using C: Horwitz and Sahni (Silicon Press)
2. Data Structures & Algorithms: R.S.Salaria (KhannaPublishers)
3. Data Structures using C and C++: Langsam, Augenstein, and Tenenbaum (PHI)
4. Introduction to Algorithms: Thomas H. Coreman, Charles E.Leiserson and Ronald L. Rivest (MIT Press)

BVSD 3.4: Relational Database Management System using Oracle

Unit I

An overview of Relational database management system, Advantages of RDBMS, DBMS vs. RDBMS, Relational Database System Architecture, Codd Rules.

Unit II

Functional dependencies, normal forms, first, second, third normal forms, BCNF, inclusion dependencies, loss less join decompositions, normalization using FD, MVD, and JDs, alternative approaches to database design.

Unit III

PL/SQL: Variables, Data types, composite data types, Array, Flow control, PL Block structure, function, procedures, parameter types, Exception Handling, Cursor & their types: implicit & explicit, Packages, Creating & Managing Triggers, Locking, Managing Subprograms, Row Level/ Table level Locking, BLOB, CLOB etc, Records, Execute, Cursor.

Unit IV

Transaction system, Testing of serializability, Serializability of schedules, conflict & view serializable schedule, recoverability, Recovery from transaction failures, log based recovery, checkpoints, deadlock handling, Concurrency control, locking Techniques for concurrency control

Recommended Texts:

1. An Introduction To Database System: Date C. J. (Addision Wesley)
2. Database Concepts: Korth, Silbertz, Sudarshan (Tata Mcgraw-Hill)
3. Fundamentals Of Database Systems: Elmasri, Navathe (Pearson Education)
4. Teach Yourself SQL/PL SQL Using Oracle: Ivan Bayross (BPB Pub)
5. An introduction to Database Systems: Bipin Desai (Galgotia Publication)

BVSD 4.1: Design and Analysis of Algorithms

Unit I

Algorithms, Analysis of Algorithms, Design of Algorithms, Complexity of Algorithms, Asymptotic Notations, Growth of function, Recurrences and their solution methods.

Unit II

Sorting in polynomial Time: Insertion sort, Merge sort, Heap sort, and Quick sort

Unit III

Binomial Heap, AVL, B-Tree, Fibonacci Heap, mergeable heaps, Dictionaries and priority Queues

Unit IV

Elementary Graph Algorithms, Breadth First Search, Depth First Search, Minimum Spanning Tree, Kruskal's Algorithms, Prim's Algorithms, Single Source Shortest Path

Recommended Texts:

1. Design and Analysis of Computer Algorithms, Aho, Pearson Education Pub.
2. Fundamentals of Computer Algorithms by Horowitz and Sahani, Galgotia
3. Introduction to Algorithms by Thomas H CormenLeiserson et al, PHI
4. Fundamental of Algorithms by Brassard Bratley, PHI
5. The Design and analysis of Algorithms by A V Aho et al, Pearson Education

BVSD 4.2: Object Oriented Programming with C++

Unit I

Approaches of Programming; Characteristics of Object Oriented Programming; Objects, Classes, Methods and Message Passing; Data Abstraction, Encapsulation, Inheritance, Polymorphism, and Dynamic Binding; Application and Benefits of Object Oriented Programming.

Unit II

Classes, Access Specifiers, Function and Data Members, Default Arguments , Function Overloading , Cin, Cout, New, Delete, Operators, Default Constructor, Parameterized Constructors,Copy Constructor , Destructors, Dynamic Memory Allocation, Friend Function, this Pointer.

Unit III

Types of Inheritance, Public-Private and Protected Derivations, Virtual Base Class, Abstract Class,CompositeObjects,Runtime Polymorphism, Virtual Functions, Pure Virtual Functions, Operator Overloading.

Unit IV

Function and Class Templates, Streams and Files, File Pointers and their Manipulations,Random Access, Namespaces, Exception Handling, Try-Catch-Throw, Uncaught Exception.

Recommended Texts:

1. Mastering C++: A.R.Venugopal, Rajkumar, T. Ravishanker (TMH)
2. C++ Primer (3rd Edition): S.B.Lippman&J.Lajoi(Addison Wesley)
3. Object Oriented Programming using C++: R.Lafore (Galgotia Publications)
4. Object Oriented Programming with C++: E.Balagurusamy (TMH)
5. Object Oriented Programming using C++: D.Parasons (BPB Publications)

BVSD 4.3: Management and Organizational Behavior Skills

Unit I

Meaning, Nature and Functions of Management; Managerial skills and competencies; Concept of Planning, its type and steps; Goals, objectives, strategies; MBO; Concept of Forecasting and Decision-Making; Concept, meaning and nature of Organizing; Organization Structure; Formal vs Informal Organisations; Departmentation; Span of Control; Authority and Responsibility; Line and Staff Relationships; Delegation and Decentralization; Importance of Coordinating, Staffing, Directing and Supervising.

Unit II

Concept, nature and importance of leadership function; Leadervs Manager; Leadership Styles; Qualities of a good leader; Concept and Importance of Control; Types and Process of Controlling; Requisites for Effective Control Systems.

Unit III

Concept and Determinants of OB; Development of Personality, Personality Traits; Approaches to Learning; Perception – Perceptual Process, Perceptual Organization, and Interpretation; Positive Attitude Development.

Unit IV

Motivation; Transactional Analysis Johari Window; Power, Sources and Bases of Power; Organizational Culture; Working effectively in a team; Working effectively for organization.

Recommended Texts:

1. Principles of Management: NeeruVashishtha (Taxmann)
2. Management: Gupta, C. B. (Sultan Chand)
3. Management: Rao, V. S. P. (Excel Books)
4. Organizational Behavior: Robins (PHI)
5. Organizational Behaviour: Luthans (McGraw Hill)

BVSD 4.4: Management Information Systems

Unit I

Fundamentals of Information Systems, Types of Information Systems, Effectiveness and Efficiency Criteria in Information System, Information Systems in Business, Solving Business Problems with Information Systems.

Unit II

Definition of Management Information System, MIS versus Data processing, MIS & Decision Support Systems, MIS & Information Resources Management, End user computing, Structure of Management Information System.

Unit III

Developing Business/IT Strategies; Planning Fundamentals; Implementing Changes; Developing Business/IT Solutions; Developing Business Systems; Implementing Business Systems; Real World Cases.

Unit IV

Internet & electronic commerce; Intranet, Extranet & Enterprise Solutions; Information System for Business Operations; Information System for Managerial Decision Support; Information System for Strategic Advantage. Enterprise & Global Management, Security & Ethical Challenges, Planning & Implementing Changes.

Recommended Texts:

1. Management Information System: O Brian (TMH)
2. Management Information System: Gordon B. Davis &Margrethe H. Olson (TMH)
3. Introduction to Information System: O Brian (McGraw Hill)
4. Information System for Modern Management: Murdick (PHI)
5. Management Information System: Jawadekar (TMH)