

Data Structure and Program Methodology

DCA-105

Block I

Unit I: Introduction: What is Data Structure, Methods of Interpreting bit setting, Types of Data Structure.

Unit II: Introduction to Algorithms: Time Complexity, Recurrence.

Unit III: Linear Data Structure: Introduction to Stack, Introduction to Queue.

Unit IV: Linked List : Inserting and Removing Nodes from a list, Linked Implemented of Stacks, Getnode and Freenode Operation, Linked Implemented of Queue, List Implementation of Priority Queue, Header Nodes, Circular Lists, Doubly linked list

Block II

Unit V: Sorting: Introduction to Sorting, Sink Sort, Selection Sort, Merge Sort, Quick Sort, Radix Sort.

Unit VI: Searching: Introduction to Searching, Linear Search, Binary Search.

Unit VII: Representation and Traversal: Representation and Traversal, Königsberg Bridge Problem.

Unit VIII: Basic Algorithms: Minimum Spanning Tree, Single Source Shortest Path.

Block III

Unit IX: Binary Tree: Array Representation of Binary Tree, Linked Representation of Binary Tree.

Unit X: Heap Sort.

Unit XI: Search Tree: AVL-Tree, B-Tree.

Unit XII: Tables: Hashing Techniques.

Block IV

Unit XIII: Sets

Unit XIV: String Algorithm: String Copy, Pattern Matching.

Unit XV: Program Development: Life Cycle, Code Designing, Coding, Programming Style

Unit XVI: Program Testing and Verification: Testing Method, Verification Procedure

Reference Books:

1. Richard F. Gilberg and Behrouz A. Forouzan, Data Structures A Pseudocode approach with C, Thomson, 2005.
2. Robert Kruse & Bruce Leung, Data Structures & Program Design in C, Pearson Education, 2007.
3. Hubbard JR: Schaum's outline of Data Structures with C++, TMH.
4. E. Horowitz, Sahni and D. Mehta: Fundamentals of Data Structures in C++, Galgotia Publication.
5. Y. Langsam, M.J. Augenstein and A.M. Tanenbaum: Data Structures Using C and C++, Prentice Hall of India.
6. R.Kruse, C.L.Tonodo and B.Leung: Data Structures and Program Design in C, Pearson Education.