

**DATA STRUCTURE & ALGORITHMS**

**UNIT- I**

Designs and Analysis of Algorithms: From Problems to Programs "Abstract Data Types – Data Types, Data Structures, and Abstract Data Types- Basic Data Types: The Data Type "List" Implementation of Lists -Stacks - Queues -Mappings - Stacks and Recursive Procedures.

**UNIT -II**

Trees: Basic Terminology -The ADT TREE -Implementations of Trees - Binary Trees - Basic Operations On Sets: Introduction to Sets -An ADT with Union, Intersection and Difference - A Bit - Vector Implementation of Sets - A Linked - List Implementation of Sets - The Dictionary - Simple Dictionary Implementations - The Hash Table Data Structure - Estimating the Efficiency of Hash Functions - Implementation of the Mapping ADT Priority Queues - Implementations of Priority Queues.

**UNIT- III**

Advanced Set Representation Methods : Binary Search Trees – Time Analysis of Binary search tree operations – Tries – Balanced Tree Implementations of Sets – Sets with the MERGE and FIND operations – An ADT with MERGE and SPLIT – Directed Graphs : Basic Definitions – Representations For Directed Graphs – The Single – Source Shortest Paths Problems – The All – Pairs Shortest Path Problem – Traversals of Directed Graphs – Directed Acyclic Graphs – Strong Components.

**UNIT -IV**

Undirected Graphs: Definitions - Minimum -Cost Spanning Trees *l* *Traversals* -- *Articulation Points* and Biconnected Components -graph matching -Sorting: The Internal Sorting Model Some Simple Sorting Schemes – Quick sort – Heap sort -Bin Sorting - A Lower Bound for Sorting by comparisons - Order Statistics -Algorithm Analysis Techniques: Efficiency of Algorithms.- Analysis of Recursive Programs ~ Solving Recurrence Equations - A General Solution for a Large Class

**UNIT-V**

Algorithm Design Techniques: Divide -and -Conquer Algorithms - Dynamic Programming - Greedy Algorithms -Backtracking - Local Search Algorithms - Data Structures and Algorithms For External Storage: A Model of External Computation - External Sorting- Storing Information in; Files- External Search Trees.

**Text Book:**

Alfred V .AHO John E.Hopcroft, Jeffrey D.Ullman, "Data Structures and Algorithms", Addison Wesley Longman Inc. Third Indian Reprint 2000.

**Reference Book**

1. S.Sahni, "Data structures and Algorithms and Applications in C++", McGraw Hill, 1998.
2. Tremblay & Soreson, "An Introduction to Data structures with applications", Second Edition, 1999.