20ES022 - Data Structures and Algorithms for Embedded Programming

UNIT I

Overview of Data Structures: Introduction,Abstract Data Types, Lists ADT, Stacks ADT, Queues ADT

Algorithm Analysis: Mathematical Background, Model, What to Analyse, Running Time Calculations

UNIT II

Trees: Introduction, Binary trees, The Search Tree ADT-Binary SearchTrees, AVL Trees, Splay Trees and B-Trees.

UNIT III

Hashing: Introduction,Hash Tables, Hash Functions and Open Hashing, Close Hashing, Rehashing.

Priority Queues (Heaps): Introduction, Binary Heaps, Applications of Priority Queues, d-Heaps, Leftist Heaps, Skew Heaps, Binomial Queues,

UNIT IV

Sorting: Introduction, Insertion Sort, A Lower Bound for Simple SortingAlgorithms, Shell Sort, Heap Sort, Merge Sort, Quick Sort, Sorting Large Structures, Bucket Sort

Graph Theory: Introduction, Topological Sort, Shortest Path Algorithm, Network Flow Problems, Minimum Spanning Tree, Applications of Depth-First Search, Introduction to NP-Completeness

UNIT V

Algorithm Design Techniques: Greedy Algorithms, Divide and Conquer, Dynamic Programming, Randomized Algorithms, Backtracking Algorithms

Text Books:

1. Mark Allen Weiss, ―Data Structures and Algorithm Analysis in C, Pearson Education, 1997.
2. Kruse R.L., Data Structure and Program Design, PHI
3. Data structures and Algorithms in C++, Michael T.Goodrich, R.Tamassia and Mount, Wiley student edition, John Wiley andSons.

References:

1. Rivest, Cormen, Introduction to Algorithms, MIT Press
2. Ellis Horowitz, SartajSahni, Fundamentals of Data Structures
3. Aaron M. Tenenbaum, Y. Langsam, Moshe J. Augenstein, Data Structures Using C