

SO9153 DATA STRUCTURES AND ALGORITHMS

L T P C
3 0 0 3
9

UNIT I

Data Structures – Data Structure Operations – Arrays – Records – Pointers – Linked Lists – Stacks – Queues – Trees – Graphs – Applications of Data Structures – Sorting and Searching – Hashing.

UNIT II

Fundamentals of the Analysis of Algorithm Efficiency – Running Time Calculations – Good Programming Practice – Structured and Modular Programming – Algorithm Analysis Techniques – Solving Recurrence Equations

UNIT III

Algorithm Design Techniques – Divide and Conquer – Decrease and Conquer – Transform and Conquer – Dynamic Programming – Greedy Method – Backtracking – Branch and Bound.

UNIT IV

Introduction to Parallel Algorithm Design - Decomposition Techniques - Characteristics of Tasks and Interactions - Mapping Techniques for Load Balancing - Methods for Containing Interaction Overheads - Parallel Algorithm Models - Performance Metrics for Parallel Systems.

UNIT V

Solving Sparse Systems of Linear Equations - Basic Concepts and Operations-Iterative Methods for Sparse Linear Systems - Direct Methods for Sparse Linear Systems - Preconditioning Techniques - Applications of Sparse Linear System Solvers.

TOTAL = 45

TEXT BOOKS

1. A.V. Aho, J.E. Hopcroft and J.D. Ullman, "Data Structures and Algorithms", Pearson Education, 2003.
2. Anshul Gupta, Ananth Grama, George Karypis and Vipin Kumar, "An Introduction to Parallel Computing: Design and Analysis of Algorithms", Addison Wesley, 2003.

REFERENCE BOOKS

1. Anany V. Levitin, "Introduction to the Design and Analysis of Algorithms", 2/E Addison - Wesley, 2007.
2. A.V. Aho, J.E. Hopcroft and J.D. Ullman, "The Design and Analysis of Computer Algorithms", Pearson Education, 2004.
3. E. Horowitz, S. Sahni and S. Rajasekaran, "Computer Algorithms/C++", Galgotia Publications, 2004.
4. E. Horowitz and S. Sahni, "Fundamentals of Data Structures", Galgotia Publications, 2004.
5. Mark Allen Weiss, "Data Structures and Algorithm Analysis in C", Addison Wesley, 2004.