Analysis and Design of Algorithm

UNIT-1

Algorithm paradigms, Asymptotic notations, Recurrences, Divide and conquer (Merge sort, Heap sort, Quick sort and its correctness proofs) Lower bounds of sorting, Counting sort.

UNIT-II

Randomization (Randomization quick sort, Primality testing), Dynamic Programming (Floyd-Warshall Algorithm, Longest Common Subsequence, Matrix chain multiplication), Greedy Method (Single source shortest path, M, Knapsack problem, Minimum cost spanning trees, Task scheduling),

UNIT- III

Polynomial time, Polynomial-time verification, NP completeness and reducibility, NP completeness proofs,, Cook's theorem, NP complete problem

UNIT – IV

Geometric algorithms (range searching, convex hulls, segment intersections, closest pairs), Numerical algorithms (integer, matrix and polynomial multiplication, FFT, extended Euclid's algorithm), Internet algorithm (text pattern matching, tries, Ukonnen's algorithm).

Books:

1. Michael Goodrich and Roberto Tamassia, "Algorithm Design", John Wiley & Sons, 2002.
2. Mark Allen Weiss, "Data Structures & Algorithm Analysis in C/C++", Pearson Edu. India.
3. T. H. Cormen, C. E. Leiserson, and R. L. Rivest, " Introduction to Algorithms", PHI.
4. Horowitz, Sahni, Rajasekaran, "Fundamentals of Computer Algorithms", Galgotia publ., 1999.