Andhra Pradesh State Council of Higher Education
M.Sc. Computer Science Syllabus

MCS 205 - DESIGN & ANALYSIS OF ALGORITHMS

Unit I

Introduction to Computer Algorithms- Algorithm Specification, Performance Analysis, Randomized algorithms Elementary Data Structures- Stacks and Queues, Tree, Dictionaries, Priority Queues, Sets and Disjoint Set Union, graphs

Unit - II

Divide - And – Conquer - General Method, Binary Search, Maximum and Minimum, Merge Sort, Quick Sort, Selection Strassen's Matrix Multiplication, Convex Hull.
The Greedy Method - Knapsack Problem, Tree vertex splitting, Job sequencing, with dead lines, Minimum-cost spanning trees, Optimal storage on tapes, Optimal merge pattern, Single source shortest paths.

Unit-III

Dynamic Programming - General method, Multistage graph, All pairs shortest path, Single-source shortest path, Optimal Binary search trees, nString Editing, 0/1 Knapsack, Reliability design, The traveling salesman problem, Flow shop scheduling. Basic Traversal and Search Techniques - Basic traversal & earch techniques - Techniques for binary trees, techniques for graphs, connected components & spanning trees, Biconnected components & DFS.

Unit-IV

Backtracking - Back tracking - The General Method, The 8- Queens Problem, Sum of subsets, Graph coloring, Hamiltonian cycle, Knapsack problem. Branch and Bound - The method, 0/1 Knapsack problem, Traveling salesperson, Efficiency considerations.

Prescribed Book:

L Ellis Horwitz, Sartaj Sahani , 'Fundamentals of Computer
Algorithms', Universities Press, The following topics in the
prescribed book Topics 1,2,3,4,5,6,7,8

Reference Books:

1. Bases S. & Gelder A.V - computer Algorithms,Addision
Wesley(200)
2. Cormen TH et al - Introduction to Algorithms, PHI(2001)
3. Brassard & Bralley - Fundamentals of Algorithms, PHI(2001)