

KL University
Department of Electronics & Computer Engineering
M.Tech (wcsn) 2015-2017

Course Code : 15-EM5216
Course Title : Design & Analysis of Algorithms
Course Structure : 3-2-0
Credits : 4

SYLLABUS:

UNIT-I

Introduction: Algorithm, Pseudo code for expressing algorithms, performance Analysis- Space complexity, Time complexity, Asymptotic Notation-Big oh notation. Omega notation, Theta notation and little oh notation.

UNIT-II

Divide and conquer: General method, applications-Binary search, Quick sort, Merge sort, Strassen's Matrix Multiplication.

Greedy method: General method, applications-Job sequencing with dead lines, 0/1 knapsack problem, Minimum cost spanning trees, Single source shortest path problem.

UNIT-III

Dynamic Programming: General method, applications-Matrix chain multiplication, Optimal binary search trees, 0/1 knapsack problem, All pairs shortest path problem, Traveling sales person problem, Reliability design.

UNIT-IV

Search Trees- Balanced search trees-AVL trees, representation, Operations-insertion, deletion and searching, B-Trees-B-Tree of order m, Operations- insertion, deletion and searching.

Backtracking General method -Applications-n-queen problem, sum of subsets problem, graph coloring, Hamiltonian cycles.

UNIT-V

and Branch and Bound: General method, **Applications** - Traveling sales person problem, 0/1 knapsack problem-LC Branch and Bound solution, FIFO Branch and Bound solution.

NP-Hard and NP-Complete problems: Basic concepts, non-deterministic algorithms, NP – Hard and NP- Complete classes

Text Books:

1. Computer Algorithms/C++, E.Horowitz, S.Sahani and S.Rajasekharan, Galgotia Publishers pvt. Limited.
2. Data Structures and Algorithm Analysis in C++, 2nd Edition, Mark Allen Weiss, Pearson Education.

Reference Books:

1. Design and Analysis of algorithms, Aho, Ullman and Hopcroft, Pearson Education.
2. Introduction to the Design and Analysis of Algorithms, A.Levitin, Pearson Education.
3. Data structures, Algorithms and Applications in C++, S.Sahni, University press (India) pvt ltd, 2nd edition, Orient Longman pvt.ltd.
- 4 Object Oriented Programming Using C++, 2nd Edition, I.Pohl, Pearson Education.