DAA Syllabus

Unit-1	**Introduction**	**Contact Hours:15**
Introduction	Characteristics of algorithm, Algorithm Specification, Analysis Framework	
Performance Analysis	Space complexity, Time complexity	
Asymptotic Notations	Big-Oh notation(O), Omega notation(Ω), Theta notation(Θ), and Little-oh notation(o), Mathematical analysis of Non-Recursive and recursive Algorithms with Examples.	
Searching and Sorting	Searching (Binay and Linear), Sorting (Quick, Bubble, Merge)	
Fundamental Data Structures	Linked lists (Single, double and circular), Operations (Traversing, Insertion and Deletion), Stacks, Queues, Graphs, Trees, Binary Search trees, AVL tree, B Trees.	
Unit-2	**Algorithm Design Paradigm**	**Contact Hours:15**
Divide and conquer	General method, Advantages and disadvantages of divide and conquer. Decrease and Conquer approach: Topological Sort., Divide and conquer vs Decrease and conquer	
Greedy Method	General method, Fractional Knapsack Problem	
Minimum cost Spanning trees	Prim's Algorithm, Kruskal's Algorithm, Single source	
Shortest paths	Dijkstra's Algorithm	
Optimal Tree Problem	Huffman Trees and Codes	
Transform and Conquer Approach	Heap and Heap Sort	
Unit-3	**Dynamic Programming**	**Contact Hours:15**
Dynamic Programming	General method with Examples, Multistage Graphs, Binomial Coefficient	
Transitive Closure	Warshall's Algorithm, All Pairs	
Shortest Paths	Floyd's Algorithm, Optimal Binary Search Trees, Knapsack Problem 0/1, Bellman-Ford Algorithm, Travelling Sales Person problem.	
Backtracking: General method	N-Queens problem, Sum of subset problem, Graph Coloring. Hamilton cycles.	
Branch and Bound	Assignment Problem, Travelling Sales Person problem, Knapsack 0/1.	
Knapsack Problem	LC Branch and Bound solution	
Types of Complexity Classes	P Class, NP Class, CoNP Class, NP-hard, NP-complete	

Suggestive Readings:

Textbooks / Reference Books:

TEXT BOOKS

T1Anany Levitin, "Introduction to the Design and Analysis of Algorithms", 2rdEdition,2009. Pearson.

T2Satraj Sahni and Rajasekaran, "Computer Algorithms/C++", Computer Science Press, 1997

T3 Ellis Horowitz", "fundamentals of computer algorithms ", 2nd Edition, 2014, Universities Press

REFERENCE BOOKS

R1 Thomas H.Cormen, Charles E.Leiserson, Ronal L. Rivest, "Introduction to Algorithms", Clifford Stein, 3rdEdition, PHI

R2 S.Sridhar, "Design and Analysis of Algorithms", Oxford(Higher Education).