I. Mid Semester I

1. Introduction - Complexity, Substitution, Recursion Tree, Master Theorem. **- Mod 1**
2. Divide and Conquer - Merge Sort and Quick Sort, Strassen's matrix multiplication algorithm. **- Mod 2**
3. Graph traversal - BFS, DFS, cycle detection using BFS for an undirected graph. **- Mod 3**
4. Greedy - Properties, Fractional Knapsack, Job sequencing, MST (Prim's and Kruskal's). **- Mod 2**
5. DP - Properties, Matrix Chain Multiplication problem, 0-1 Knapsack. **- Mod 3**

II. Mid Semester II

1. DP - Properties, Matrix Chain Multiplication problem, 0-1 Knapsack, TSP. **- Mod 3**
2. Backtracking - N Queens, Graph coloring, Subset-Sum problem. **- Mod 3**
3. Branch and Bound - 0/1 Knapsack, 15-puzzle. **- Mod 4**
4. Shortest paths problem - Dijkstra, Bellman-Ford, Floyd-Warshall. **- Mod 3**
5. Network Flow using Ford-Fulkerson. **- Mod 4**
6. Notion of NP, NP Completeness, Proofs (2-CNF SAT is polynomial time solvable, 3-CNF SAT is NP Hard). **- Mod 4**

Additional Topics for End Semester:

1. Approximation algorithm (Vertex cover problem) - Mod 3

2. KMP - Mod 3