**SUBJECT NAME: ADVANCED ALGORITHMS**

**OBJECTIVE:** This course is to teach the students the basics of algorithms and the different techniques to solve problems.

**Unit-I**

Introduction to Algorithms, Analyzing algorithms, Complexity of algorithms, Asymptotic notation: Big Oh, Omega, and Theta, Worst, Average, and Best-case analysis; Recurrence relation: Master method, Substitution method

**Unit-II**

**Brute-force approach:** Insertion sort, Count sort, Linear search

**Divide and Conquer approach:** Quick-sort, Merge sort, Binary search

**Unit-III**

**Dynamic Programming:** Longest common subsequence, single-source shortest path, 0/1 Knapsack problem, Travelling Salesman problem.

**Unit-IV**

**Greedy Algorithm:** Job sequencing with deadlines, minimum spanning tree (Prim's and Kruskal's algorithms), Sudoku

**Unit-V**

**Backtracking and Branch and Bound strategy:** Tic-Tac-Toe,Graph Coloring, n-Queen Problem.

**String Matching:** Naïve string matching

**Text Book:** Introduction to Algorithms 3rd Edition Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, Clifford Stein Prentice Hall Publications

**Reference Book:** Fundamental of Computer Algorithms 2nd Ellis Horowitz, Sartaj Sahni, Sanguthevar Rajasekaran W. H. Freeman Silicon Press