**Sardar Vallabhbhai Patel Institute of Technology, Vasad**.

Information Technology Department

MID TERM EXAM COURSE

Subject Name: **ANALYSIS & DESIGN of ALGORITHM (** **2150703)**

|  |  |
| --- | --- |
| **SR. NO** | **TOPIC** |
| **1** | |  | | --- | | **Basics of Algorithms and Mathematics:**  What is an algorithm?, Mathematics for Algorithmic Sets, Functions and Relations, Vectors and Matrices, Linear Inequalities and Linear Equations | |
| **2** | |  | | --- | | **Analysis of Algorithm:**  The efficient algorithm, Average, Best and worst case analysis, Amortized analysis , Asymptotic Notations, Analyzing control statement, Loop invariant and the correctness of the algorithm, Sorting Algorithms and analysis: Bubble sort, Selection sort, Insertion sort, Shell sort Heap sort, Sorting in linear time : Bucket sort, Radix sort and Counting sort | |
| **3** | |  | | --- | | **Divide and Conquer Algorithm:**  Introduction, Recurrence and different methods to solve recurrence, Multiplying large Integers Problem, Problem Solving using divide and conquer algorithm - Binary Search, Max-Min problem, Sorting (Merge Sort, Quick Sort), Matrix Multiplication, Exponential. | |
| **4** | |  | | --- | | **Dynamic Programming:**  Introduction, The Principle of Optimality, Problem Solving using Dynamic Programming – Calculating the Binomial Coefficient, Making Change Problem, Assembly Line-Scheduling, Knapsack problem, All Points Shortest path, Matrix chain multiplication, Longest Common Subsequence. | |
| **5** | |  |  |  | | --- | --- | --- | | **Greedy Algorithm**  General Characteristics of greedy algorithms, Problem solving using  Greedy Algorithm  - Activity selection problem, Elements of Greedy Strategy, Minimum Spanning trees (Kruskal’s algorithm, Prim’s algorithm), Graphs: Shortest paths, The Knapsack Problem, Job Scheduling Problem, Huffman code. |  |  | |
| **6** | **Exploring Graphs:**  An introduction using graphs and games, Undirected Graph, Directed Graph, Traversing Graphs, Depth First Search, Breath First Search, |

**Prof. Sneha Gaywala**

**Prof. Amit Chaudhari Prof.Virendra Barot,**

**Course Co-ordinator Subject Teacher**

**IT Dept. IT Dept.**