MAULANA AZAD NATIONAL INSTITUTE OF TECHNOLOGY
BHOPAL - 462003

Name of Program B.Tech **Semester** IV **Year** II

Name of Course Algorithm Design & Analysis

Course Code CSE 221

Core / Elective / Other Core

Prerequisite:

1. Data Structure
2. Basics of any computer programming knowledge

Course Outcomes:

On successful completion of the course, student be able to:

1. Analyze time and space complexity for the given algorithms.
2. Use various searching, sorting and graph traversal algorithms.
3. Use various techniques for efficient algorithm design like divide and conquer, greedy and dynamic algorithms.
4. Describe minimum spanning tree algorithms, Single source shortest path, all pair shortest path algorithms in a graph and backtracking concepts.
5. Describe polynomial and non-polynomial problems, classify NP hard and NP complete problems with their application.

Description of Contents in brief:

1. Fundamentals of algorithm- analysis of complexity, recurrence relations, disjoint set structure
2. Algorithm design techniques and Masters Theorem to compute algorithms time complexity
3. Greedy algorithm and Dynamic programming concepts
4. Spanning Tree algorithms, graph shortest path algorithms
5. Branch and Bound techniques, Backtracking algorithms and graph traversal algorithms (BFS and DFS)
6. Introduction of NP-completeness and NP-hardness problems

List of Text Books:

1. Fundamentals of Computer Algorithms by Horowitz Ellis and Sartaj Sahni
2. An Introduction to Algorithm by Thoman H. Cormen, Ronald L. Rivest

List of Reference Books:

1. Sanjoy Dasgupta, Christos Papadimitriou, Umesh Vazirani: Algorithms
2. Data Structures and Algorithms Made Easy : Data Structure and Algorithmic Puzzles

URLs:

1. https://nasirmir.files.wordpress.com/2012/09/fundamentals-of-computer-algorithms-by-ellis-horowitz-1984.pdf
2. https://nptel.ac.in/courses/106101060/
3. http://web.stanford.edu/class/cs161/schedule.html
4. https://www.coursera.org/specializations/algorithms