MAULANA AZAD NATIONAL INSTITUTE OF TECHNOLOGY
BHOPAL - 462003

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

Name of Course Data Structures
Course Code CSE 211
Core / Elective / Other Core

Prerequisite:
1. Programming Languages

Course Outcomes:
On successful completion of the course, students should be able to
1. Describe the concepts and importance of data structures.
2. Implement various types of data structures.
3. Determine the algorithm correctness and its efficiency.

Description of Contents in brief:

Introduction to Data Structures, Algorithm Evaluation, Arrays, Multi-dimensional Arrays, Sparse Matrices, Structure, Pointers, Stacks: representation of stacks and basic operations, applications of Stacks, Prefix, Postfix and Infix notations and conversion, Recursion, Towers of Hanoi. Queues: Types of Queue and its application. Linked lists: Types of Linked list, implementation of Stack and Queue using Linked list, Polynomial representation and Arithmetic. Trees: binary tree, n-ary Tree, Tree Traversal, AVL Trees, Binary Search trees, Graphs: Representation, Traversing. Searching: Sequential Search, Binary Search, and Hashing. Sorting: External and Internal Sort, Selection Sort, Bubble Sort, Insertion Sort, Radix Sort, and Bucket Sort.

List of Text Books:
1. Fundamentals of Data Structures by E.Horowitz and S.Sahni, Computer Science Press.
2. Data Structure Using C by A. M. Tanenbaum, PHI.

List of Reference Books:
1. Data Structures and Algorithms in C (Second edition) by M. T. Goodriche and R. Tamassia, John Wiley & Sons.
2. Data Structures and Algorithm Analysis in C (Second Edition), by M. A. Weiss, Addison-Wesley, 2013.
3. Classic Data Structures by D. Samantha, PHI.
4. Data Structures, Schaum's Series

URLs:
1. NOC:Programming, Data Structures and Algorithms - https://nptel.ac.in/courses/106102064/
2. Stanford CS166: Data Structures - http://web.stanford.edu/class/cs166/