

## **MIT(CS)-401**

### **Data Structure**

#### **Block -1**

##### **Unit-1**

Introduction to Data Structure , Methods of Interpreting bit setting, Types of Data Structure, Dynamic Memory Allocation, Abstract Data Types,

##### **Unit-2**

Introduction to Algorithms, Algorithmic Complexity , Space Complexity ,Time Complexity, Asymptotic Notation, Big Omega Notation  $\Omega (f)$ , Big Oh Notation  $o(f)$ , Big Theta Notation  $\Theta(f)$

##### **Unit-3**

Introduction Linear Data Structure, Stack, Queue

##### **Unit-4**

Introduction to Linked Lists, Inserting and Removing Nodes from a list Linked ,Implemented of Stacks , Getnode and Freenode Operation ,Linked Implemented of Queue ,List Implementation of Priority Queue, Header Nodes, Circular Lists , Doubly linked list

#### **Block -2**

##### **Unit-1**

Introduction to Sorting Algorithm , Insertion Sort, Selection Sort, Bubble Sort ,Merge Sort Quick sort, Radix Sort

##### **Unit-2**

Introduction to searching algorithm, Linear Search, Binary Search, Performance and Complexity

##### **Unit-3**

Introduction of a graph, Terminologies of Graph, Types of Graph, Representation of Graph, Sequential Representation of Graph, Linked Representation of Graph, Traversal in Graphs, Depth First Search, Breadth First Search, Königsberg Bridge Problem.

##### **Unit-4**

Minimum Spanning Tree , Single Source Shortest Path

### **Block-3**

#### **Unit-1**

Introduction of a tree, Binary Tree, Binary Tree Representation, Tree Traversal Algorithms, Preorder Traversal, Inorder Traversal, Postorder Traversal, Prefix, Postfix and Infix Notations

#### **Unit-2**

Introduction to Heap sort, Heap Representation Priority Queue

#### **Unit-3**

Introduction Avl- Tree, Representation of AVL Tree, B-Tree, Operations on B – Tree,

#### **Unit-4**

Introduction to Hashing Techniques, Methods of Dealing with Hash Clash , DOUBLE HASHING, Clustering, DYNAMIC AND EXTENDIBLE HASHING

### **Block-4**

#### **Unit-1**

Introduction to Bit Vector Representation, Linked list representation

#### **Unit-2**

Introduction to STRING ALGORITHM, String Function, STRING LENGTH ,STRING ,CONCATENATION, String Copy, Pattern Matching, Brute Force String Matching algorithm, Knuth-Morris-Pratt(KMP) string matching algorithm

#### **Unit-3**

Introduction to PROGRAM DEVELOPMENT& PROGRAM TESTING AND VERIFICATION, Life Cycle, Code Designing, Coding, Programming Style, Testing Method ,Verification Procedure