Course No.: MCA – 2T2
Course Title: Data & File Structures

Unit I
Introduction: Structure and problem solving, Primitive Data Structures: Operation On primitive Data Structures, Recursion Function and its examples.
String Manipulation, String Matching Techniques & Applications(examples: Text Editing, Lexical Analysis).

Unit II
Concept of Stack and Queue. Singly and Doubly-Linked Lists, Circular Linked List, their implementation and comparison. Array based and Linked List based Implementation of stack and Queues and their applications.

Unit III
Searching: Sequential and Binary Search on Array-based ordered lists. Binary Trees, their implementation and traversal. Binary Search Trees: Searching, Insertion and Deletion of nodes. Height Balance and Concept of AVL Trees. Concept and purpose of B-Trees.

Unit IV
Concept of Hash Functions, Hash-tables and Hashing with Chaining. Sorting Techniques: Insertion Sort, Selection Sort, Quick Sort, Heap Sort. External Sorting: k-Way Merge Strategy.
File Structure: Sequential Files, Indexed Files, Direct Files.

Unit V
Graphs: Definition, Terminology and representation using Adjacency Matrix and linked list. Shortest Path Algorithms and their implementation. Graph Traversals: BFS and DFS Algorithms and their Implementations.

Reference Books:
1. Trebley and Sorenson: "An Introduction to Data Structures with Applications" McGraw Hill, Kongakusha 1976.
2. Horowitz and Sahni: "Data Structures" SBCS Publication, 1980.
3. Michael J.Folk et al "File Structure an Object Oriented Approach with C++.