DATA AND FILE STRUCTURES

1. Introduction

Objective: The course would equips the students with knowledge about various basic data structures and their appropriate use in specific applications.

Credits: 3-1-0

2. Course Outline

UNIT - I: Introduction

Introduction to data structures and data types, Tracing of the algorithms, Time complexity analysis of algorithms with respect to data structure operations

UNIT – II: Linear data structures

Arrays, Row-major and Column major order, Polynomial Manipulations Stacks, Recursion with examples from mathematics, graphics, and languages, Infix to Postfix conversion Queues, Priority queues , Linked Lists and their variations (Circular linked list, Double linked list)

UNIT - III: Non-linear Data Structures

Trees, Traversals, Binary Search Trees, Heaps, Splay trees, Graphs, Representations of the graphs, Graph Traversals

UNIT - IV: Search Mechanisms

Linear Search, Binary Search, Hash Tables

UNIT - V: Sorting

Bubble sort, Selection sort, Merge Sort, Heap sort

UNIT - VI: File structures

Indexing, B-trees, B^+ trees

3. Reading Material

Reference Books

1. An introduction to Data Structures with Applications (Second edition), Tremblay and Sorenson, Tata Mecgrahill
2. Data Structures and Algorithms in Java (4th edition), Michael T. Goodrich and Roberto Tamassia, John Wiley and sons
3. A Practical Introduction to Data Structures and Algorithm Analysis, Clifford A Schaffer, Prentice Hall

Suggested Assignments

Constuction of a city database using a linked list and binary search tree and the appropriateness of these structures under various demands for the data. Some problems of similar nature.