3rd Semester

Data Structure (RCS3C002)

Module – I (12 Hrs.)
Introduction: Basic Terminologies: Elementary Data Organizations, Data Structure Operations: insertion, deletion, traversal etc.; Analysis of an Algorithm, Asymptotic Notations, Time-Space trade off Searching: Linear Search and Binary Search Techniques and their complexity analysis.

Module — II (08 Hrs.)
Stacks and Queues: ADT Stack and its operations: Algorithms and their complexity analysis, Applications of Stacks: Expression Conversion and evaluation corresponding algorithms and complexity analysis. ADT queue, Types of Queue: Simple Queue, Circular Queue, Priority Queue; Operations on each types of Queues: Algorithms and their analysis.

Module – III (08 Hrs.)
Linked Lists: Singly linked lists: Representation in memory, Algorithms of several operations: Traversing, Searching, Insertion into, Deletion from linked list; Linked representation of Stack and Queue, Header nodes, Doubly linked list: operations on it and algorithmic analysis; Circular Linked Lists: all operations their algorithms and the complexity analysis.

Module – IV (10 Hrs.)
Sorting and Hashing: Objective and properties of different sorting algorithms: Selection Sort, Bubble Sort, Insertion Sort, Quick Sort, Merge Sort, Heap Sort; Performance and Comparison among all the methods, Hashing.

Module – V (07 Hrs.)
Trees: Basic Tree Terminologies, Different types of Trees: Binary Tree,Threaded Binary Tree, Binary Search Tree, AVL Tree; Tree operations on each of the trees and their algorithms with complexity analysis. Applications of Binary Trees. B Tree, B+ Tree: definitions, algorithms and analysis.
Graph: Basic Terminologies and Representations, Graph search and traversal algorithms and complexity analysis.

Books:
- "Fundamentals of Data Structures", Illustrated Edition by Ellis Horwitz, Satraj Sahani, Computer Science Press.
- "Algorithms, Data Structures and Problem solving using c++", Illustrated by Mark Allen Weiss, Addision –Wisley Publishing Company.
- "How to solve it by Computer", 2nd Impression by R. G. Dormey, Pearson Education
- "Fundamentals of Data Structures", Illustrated Edition by Ellis Horowitz, Sartaj Salmi, Computer Science Press.
- Algorithms, Data Structures, and Problem Solving with C++", Illustrated Edition by Mark Allen Weiss, Addison-Wesley Publishing Company
- "How to Solve it by Computer", 2nd Impression by R.G. Dromey, Pearson Education