Course Code (BCA-CR2101)   Semester-II   **Maximum Marks: 60**
Course Title: Data Structures using C
Total Credits: 04

Course Objective

The objective is that the students will learn how to use and manipulate
several core data structures.

Unit-I

Introduction to Data Structures: Definition, Classification and various operations.
Introduction to time & space complexity: concept of best case, worst case and average
case.

Arrays: Introduction, representation of 1D & 2D array, implementation of stack & queue
using arrays: various operation on stack and queue.

UNIT II

Searching and Sorting Algorithms: Linear Search & Binary Search; Bubble Sort, Insertion Sort,

Selection Sort, Quick Sort, Merge Sort.

UNIT III

Polish Notation: Infix, prefix, postfix representation and their evaluation using stack

Linked Lists: Introduction, Types (Single, Double & Circular) and their Operations
(creation, insertion, deletion); Implementation of stack and queue using linked list.

UNIT IV

Trees: Basic Terminology: Binary Tree, node, Strictly Binary Tree, level, depth Complete
Binary Tree, Traverse a binary tree (Pre-order, In-order and Post-order)
Binary search Tree and its Representation in Memory;

Graphs: Introduction to graph, BFS and DFS algorithms.

References:

1. **Robert L Kruse,** "Data Structures and Program Design in C",PHI.
2. **Alfred V. Aho and Jeffrey D. Ullman** "Data Structures and Algorithms",Addison-
   Wesley.
3. **Trebley and Sorenson**,"An Introduction to Data Structure with Application",TMH.
4. **Sahni Horowitz,** "Fundamentals of Data Structures in C" ,University Press.
5. **Seymour Lipschutz**,"Data Structures with C (Schaum's Outline Series)",TMH.