

## **DATA STRUCTURES LAB**

### **Course Description and Objectives:**

The course is designed to develop skills to design and analyze simple linear and non linear data structures. It strengthens the ability to the students to identify and apply the suitable data structure for the given real world problem. It enables them to gain knowledge in practical applications of data structures .

### **Course Outcomes:**

At the end of this lab session, the student will

- Be able to design and analyze the time and space efficiency of the data structure
- Be capable to identify the appropriate data structure for given problem
- Have practical knowledge on the applications of data structures

### **List of Experiments:**

1. Design and Implement List data structure using i) array ii) singly linked list.
2. Design and Implement basic operations on doubly linked list.
3. Design and Implement stack using i) array ii) singly linked list
4. Design and Implement Queue using i) array ii) singly linked list
5. Design and Implement basic operations on Circular Queue
6. Design and Implement basic operations(insertion, deletion, search, findmin and findmax) on Binary Search trees.
7. Implementation of Breadth First Search Techniques.
8. Implementation of Depth First Search Techniques.
9. Implementation of Dijkstra's Algorithm.
10. Implementation of Kruskal's Algorithm.
11. Implementation of MergeSort.
12. Implementation of Binary Search using arrays.

### **Reference Books**

1. Brian W. Kernighan and Dennis M. Ritchie, The C Programming Language, Prentice Hall of India.
2. E. Balaguruswamy, Programming in ANSI C, Tata McGraw-Hill.
3. Byron Gottfried, Schaum's Outline of Programming with C, McGraw-Hill.
4. Seymour Lipschutz, Data Structures, Schaum's Outlines Series, Tata McGraw-Hill.
5. Ellis Horowitz, Satraj Sahni and Susan Anderson-Freed, Fundamentals of Data Structures in C, W. H. Freeman and Company.
6. R. G. Dromey, How to Solve it by Computer, Prentice-Hall of India.