**SR23 B.Tech. CSE Syllabus SPHN Hyderabad**

**DATA STRUCTURES LAB**

**(S23CS306PC)**

**B.Tech. II Year I Sem. L T P C**

**0 0 3 1.5**

**Prerequisites:** A Course on “Programming for problem solving”.

**Course Objectives :**

• It covers various concepts of C programming language.

• It introduces searching and sorting algorithms

• It provides an understanding of data structures such as stacks and queues.

**Course Outcomes :** After learning the contents, student must be able to,

• Ability to develop C programs for computing and real-life applications using basic elements like

control statements, arrays, functions, pointers and strings.

• Ability to implement to data structures like stacks, queues and linked lists.

• Ability to Implement searching and sorting algorithms.

• Ability to implement Graphs and trees.

• Implement pattern matching algorithms.

**List of Experiments:**

1. Write a program that uses functions to perform the following operations on singly linked list.:

i) Creation ii) Insertion iii) Deletion iv) Traversal

2. Write a program that uses functions to perform the following operations on doubly linked list.:

i) Creation ii) Insertion iii) Deletion iv) Traversal

3. Write a program that uses functions to perform the following operations on circular linked list.:

i) Creation ii) Insertion iii) Deletion iv) Traversal

4. Write a program that implement stack (its operations) using

i) Arrays ii) Pointers

5. Write a program that implement Queue (its operations) using

i) Arrays ii) Pointers

6. Write a program that implements the following sorting methods to sort a given list of integers in ascending order

i) Quick sort ii) Heap sort iii) Merge sort

7. Write a program to implement the tree traversal methods (Recursive and Non Recursive).

8. Write a program to implement

i) Binary Search tree ii) B Trees iii) B+Trees

iv) AVL trees v) Red – Black trees

9. Write a program to implement the graph traversal methods.

10. Implement a Pattern matching algorithms using Boyer-Moore, Knuth-Morris-Pratt

**TEXT BOOKS:**

1. Fundamentals of Data Structures in C, 2nd Edition, E.Horowitz, S.Sahni and Susan Anderson Freed, Universities Press.

2. Data Structures using C – A.S. Tanenbaum, Y. Langsam, and M.J. Augenstein, PHI/Pearson

Education.

**REFERENCE BOOK:**

1. Data Structures: A Pseudocode Approach with C, 2nd Edition, R.F. Gilberg and B.A. Forouzan,

Cengage Learning.