Course Title: Data Structure and Algorithms LAB   **Credit: 1**

Course No.: CSIT.121

Nature of the Course: LAB

Level: B.Sc. CSIT Year: First   **Semester: Second**

Laboratory Work Guidelines: Students will have to complete the assigned practical work throughout the semester and Practical examination will be conducted at the end of academic semester. The practical exam will be graded on the basis of the following marking scheme:

In-Semester Evaluation (Lab Book or Journal)	25 %
Final Exam Written	50 %
Final Exam Oral	25 %

Following are the guideline for the lab work:

1. There should be a lab book for the practical work related to the subject

2. The lab book will contain details of all practical's to be conducted in the lab

3. Students should read the lab book before coming to the lab

4. Every practical should have:

    a. Title

    b. Objectives

    c. Description

    d. Examples

    e. Self Activities

        i. Objective questions

        ii. Sample programs to be typed and executed

    f. Task list to be decided by the lab in-charge.

    g. Outputs to be verified by the lab in-charge.

5. Each practical should be conducted in the following manner:

    a. Explanation by lab in-charge – 10 minutes

    b. Self activities by students

    c. Lab in-charge will allocate tasks to each student (selection from a list / modify given task / specify new task)

d. At the end of the slot, the lab in-charge has to verify the outputs and give a remark (Complete / Incomplete / Needs Improvement)

Assignment List for Lab Work

All the students will have to complete the following set of programming using the "C" Programming language. Lab in-charge may assign additional assignment depending upon the time available.

1. Sorting Algorithms – Bubble sort, Insertion, selection, quick sort and merge.
2. Static/Dynamic stack implementation, infix to postfix, infix to prefix and evaluation of Postfix.
3. Static and Dynamic Queue Implementation.
4. Singly Linked List, Doubly Linked List and Circular Linked List.
5. Polynomial addition (Using Linked list).
6. Binary Tree Traversal: Create, add, delete, and display nodes.
7. Graph: in degree, out degree, DFS, BFS.
8. Shortest path Dijkstra algorithm.
9. Adjacency matrix to adjacency list conversion.

Recommended Books

5. Horowitz Sahani, **Fundamentals of Data Structures,** Galgotia Publication
6. ISRD Group, **Data Structures using C,** Tata McGraw Hill
7. Ashok Kamthane, **Introduction to Data Structures using C**
8. Bandopadhyay & Dey, **Data Structures using C,** Pearson
9. Nitin Upadhyay, SK, **The Design and Analysis of Algorithm**, Kataria & Sons