DATA STRUCTURES LAB
(Common to CSE&IT)

Course Code :13CT1107	L	T	P	C
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Course Educational Objectives:

To teach the students how to write programs that implement data structures concepts.

❖ Write programs to implement various data structures concepts like Searching, Sorting, Trees, and Graphs.

❖ Solving the problems regarding large data structures like stack and queue.

❖ To know programming about linked stacks and linked queues.

❖ Advanced programming

❖ Solve the problem regarding memory locations practically so that the student will be benefitted in the usage of pointers.

Course Outcomes:

At the end of the course student will be able to

❖ Gain knowledge on how to develop programs using c .

❖ Implement various data structures using arrays.

❖ Implement linked lists , queues, trees and graphs.

❖ To obtain minimum cost spanning tree.

❖ Find shortest path using algorithms.

List of Programmes :

1. Write C programs that uses recursive function to:i) Compute factorial of a given number ii) Solve the towers of Hanoi problem.

2. Write C programs that implement the following data structures using arrays:i) Stack ii) Queue.

3. Write C programs to implement the following Stack applications i) Factorial ii) Evaluations of postfix expression.

4. Write C programto implement the following types of queues i) Priority Queue ii) Circular Queue.

5. Write C programs to implement the following types of Lists i) Singly linked list ii) Circularly Linked list iii) Doubly linked list.

6. Write C programs to implement the following data structures using Lists i) Stack ii) Queue.

7. Write C programsto implement the following search algorithms: i) Linear Search iv) Binary Search v) Fibonacci Search.

8. Write C programs to implement the following sorting algorithms i) Bubble Sort ii) Insertion Sort iii) Selection Sort.

9. Write C programs to implement the following sorting algorithms i) Merge Sort ii) Quick Sort.

10. Write a Cprogram to implement binary tree using arrays and to perform binary tree traversals i) inorder ii) postorder iii) preorder.

11. Write a C program to perform the following operations using linked lists: i)insert an element into a binary search tree. ii) Delete an elementfrom a binary search tree. iii) Search for a key element in abinary search tree.

12. Write a C program to perform the following operations using linked lists :i) Insert an element into an AVL tree. ii) Delete an element from an AVL tree.

13. Write C programs for the implementation of bfs and dfs fora given graph.

14. Write a C program for the implementation of Prim's algorithm to obtain the minimum cost spanning tree from a connected undirected graph.

15. Write a C program to implement Dijkstra's algorithm for the single source shortest path problem.

REFERENCES:

1.   G A V PAI, *"Data Structures and Algorithms, Concepts, Techniques and Applications"*, Volume 1, 1st Edition, Tata McGraw-Hill, 2008.

2.   Richard F. Gilberg & Behrouz A. Forouzan, *"Data Structures, A Pseudo code Approach with C"*, 2nd Edition, Cengage Learning India Edition, 2007.