Programme: CSE-DS					Semester: III
Course Code	Course Name	L	T	P	C
20CS3L02	**DATA STRUCTURES & ALGORITHMS LAB**	0	0	3	1.5
Subject Category :	**PCC LAB**				

Course Outcomes:

At the end of the Course the student shall be able to

CO1:Apply recursive and iterative methodologies to solve complex engineering problems.

CO2: Solve searching and sorting techniques and evaluate time & space complexities.

CO3: Develop solutions to create and implement operations of linear and nonlinear data structures.

CO 4:Identify and apply suitable data structure for a given real time problem

List of Experiments:

Exercise 1:

a) Write a recursive C program to calculate Factorial of an integer.
b) Write a recursive C program which computes the n^{th} Fibonacci number, for appropriate values of n.

Exercise 2:

a) Write a recursive C program to calculate GCD (n, m).
b) Write a recursive C program for Towers of Hanoi: N disks are to be transferred from peg S to peg D with Peg I as the intermediate peg.

Exercise 3:

a) Write a C program that implements Selection sort, to sort a given list of integers in ascending order.
b) Write a C program that implements Insertion sort, to sort a given list of integers in ascending order.

Exercise 4:

a) Write a C program that implements Quick sort, to sort a given list of integers in ascending order.
b) Write a C program that implements Radix sort, to sort a given list of integers in ascending order.
c) Write a C program that implements Merge sort, to sort a given list of integers in ascending order.

Exercise 5:

a) Write a C program that implements Stack (its operations) using arrays.
b) Write a C program that uses Stack operations to convert infix expression into postfix expression

Exercise 6:

a) Write a C program that implements Queue (its operations) using arrays.
b) Write a C program that implements Circular Queue (its operations) using arrays.

Exercise 7:

a) Write a C program that uses functions to create a singly linked list and its operations(insert, delete, search).
b) Write a C program to reverse elements of a singly linked list.

Exercise 8:

a) Write a C program that implements Stack (its operations) using Linked list.
b) Write a C program that implements Queue (its operations) using Linked list.

Exercise 9:

a) Write a C program to create a Circular Linked list and its operations(insert, delete, search).
b) Write a C program to create a Doubly Linked list and its operations(insert, delete, search).

Exercise 10:

a) Write a C program to create a Binary Search Tree and its operations.
b) Write a recursive C program for traversing a Binary Search Tree in preorder, inorder and postorder.

Exercise 11:

a) Write a C program to perform BFS traversal on given graph.
b) Write a C program to perform DFS traversal on given graph.

TEXT BOOKS:

1. Richard F, Gilberg, Forouzan, Data Structures, 2nd edition, Cengage
2. Aaron M. Tenenbaum, YedidyahLangsam, Moshe J Augenstein, Data Structures usingC, Pearson.
3. Mark Allen Weiss, Data structures and Algorithm Analysis in C, 2nd edition, Pearson Education. Ltd.

REFERENCE BOOKS:

1. Jean-Paul Tremblay Paul G. Sorenson, An Introduction to Data Structures with Applications, 2nd edition, Mc Graw Hill Higher Education
2. Seymour Lipschutz, Data Structure with C, TMH
3. ReemaThareja, Data Structures using C, 2nd edition, Oxford