

<b>2018-19 Onwards (MR-18)</b>	<b>MALLA REDDY ENGINEERING COLLEGE (Autonomous)</b>	<b>B.Tech. II Semester</b>		
<b>Code: 80504</b>	<b>DATA STRUCTURES LAB</b> (Common for EEE, ECE, CSE and IT)	<b>L</b>	<b>T</b>	<b>P</b>
<b>Credits: 1</b>		-	-	<b>2</b>

### Course Objectives:

This course will deliver the knowledge in introducing the concepts of various data structures such as linked lists, stacks, queues, trees and graphs along with the applications.

**Software Requirements:** Turbo C

### List of Programs:

- 1 Write a recursive program to solve Towers of Hanoi problem - N disks are to be transferred from peg S to peg D with Peg I as the intermediate peg.
- 2 Write a program to create a single linked list, with the following operations:
  - a) Insertion
  - b) Deletion
  - c) Display the elements
  - d) Count no of elements.
- 3 Write a program to create a circular linked list, with the following operations:
  - a) Insertion
  - b) Deletion
  - c) Display the elements
  - d) Count number of elements.
- 4 Write a program to create a double linked list, with the following operations:
  - a) Insertion
  - b) Deletion
  - c) Display the elements
  - d) Count number of elements.
- 5 Write a program to implements stack operations using:
  - a) Arrays
  - b) Linked list
- 6 Write a program to:
  - a) Evaluate Postfix expression.
  - b) Convert infix expression into postfix expression
- 7 Write a program to implements Linear Queue operations using:
  - a) Arrays
  - b) Linked list
- 8 Write a program to implements Circular Queue operations using Arrays
- 9 Write a program to implements Double-ended Queue operations using:
  - a) Arrays
  - b) Double Linked List

- 10 Write a recursive program to create a Binary Tree of integers, traverse the tree in preorder, in order and post order and also print the number of leaf nodes and height of the tree.
- 11 Write a program to create a Binary Search Tree (BST) and perform insert and search operations on it.
- 12 Write a program for implementing the following graph traversal algorithms:
  - a) Breadth First Search (BFS)
  - b) Depth First Search (DFS)

### **TEXTBOOKS**

1. Jean Paul Tremblay, Paul G Sorenson, “**An Introduction to Data Structures with Applications**”, Tata McGraw Hills, 2nd Edition, 1984.
2. Richard F. Gilberg, Behrouz A. Forouzan, “**Data Structures: A Pseudo code approach with C**”, Thomson (India), 2nd Edition, 2004.

### **REFERENCES**

1. Horowitz, Ellis, Sahni, Sartaj, Anderson-Freed, Susan, “**Fundamentals of Data Structure in C**”, University Press (India), 2nd Edition, 2008..
2. A. K. Sharma, “**Data Structures using C**”, Pearson, 2nd Edition, June, 2013.
3. R. Thareja, “**Data Structures using C**”, Oxford University Press, 2nd Edition, 2014.

### **Course Outcomes:**

At the end of the course, students will be able to

1. Identify the appropriate recursive algorithms and analyze the performance of algorithms.
2. Understand and implement single, double, and circular linked-lists.
3. Implement linear data structures such as Stacks and Queues using array and linked-list representations.
4. Implement non linear data structures such as trees and graphs.