

**Data Structures Lab**

<b>Course Code</b>	20ES1356	<b>Year</b>	II	<b>Semester</b>	I
<b>Course Category</b>	ES Lab	<b>Branch</b>	CSE	<b>Course Type</b>	Practical
<b>Credits</b>	1.5	<b>L-T-P</b>	0-0-3	<b>Prerequisites</b>	Programming for Problem Solving
<b>Continuous Internal Evaluation:</b>	15	<b>Semester end evaluation</b>	35	<b>Total Marks</b>	50

**Course Outcomes**

Upon successful completion of the course, the student will be able to

<b>CO1</b>	Apply Linear and non-linear data structures for solving problems.	<b>L3</b>
<b>CO2</b>	Implement programs as an individual on different IDEs	<b>L3</b>
<b>CO3</b>	Develop an effective report based on various programs implemented	<b>L3</b>
<b>CO4</b>	Apply technical knowledge for a given problem and express with an effective oral communication	
<b>CO5</b>	Analyze outputs using given constraints/test cases	<b>L4</b>

**Contribution of Course Outcomes towards achievement of Program Outcomes & Strength of correlations**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
<b>CO1</b>													√	
<b>CO2</b>					√				√					
<b>CO3</b>										√				
<b>CO4</b>	√									√				
<b>CO5</b>			√											

<b>Syllabus</b>		
<b>Unit No.</b>	<b>Contents</b>	<b>Mapped CO</b>
1.	Demonstrate recursive algorithms with examples.	<b>CO1,CO2,CO3,CO4,CO5</b>
2.	Implement various searching techniques.	<b>CO1,CO2,CO3,CO4,CO5</b>
3.	Develop programs for different sorting techniques	<b>CO1,CO2,CO3,CO4,CO5</b>
4.	Implement and perform different operations on Single, Double and Circular Linked Lists.	<b>CO1,CO2,CO3,CO4,CO5</b>
5.	Develop a program to perform operations of a Stack using arrays and linked Lists.	<b>CO1,CO2,CO3,CO4,CO5</b>
6.	Develop programs to implement Stack applications.	<b>CO1,CO2,CO3,CO4,CO5</b>
7.	Develop a program to perform operations of Linear Queue using arrays and linked Lists.	<b>CO1,CO2,CO3,CO4,CO5</b>
8.	Implement Circular Queues.	<b>CO1,CO2,CO3,CO4,CO5</b>
9.	Develop a program to represent a tree data structure.	<b>CO1,CO2,CO3,CO4,CO5</b>
10.	Develop a program to demonstrate operations on Binary Search Tree.	<b>CO1,CO2,CO3,CO4,CO5</b>
11.	Demonstrate Graph Traversal Techniques.	<b>CO1,CO2,CO3,CO4,CO5</b>
12.	Develop a program to find Minimum cost Spanning tree.	<b>CO1,CO2,CO3,CO4,CO5</b>

### **Learning Resources**

#### **Text Books**

1. Data Structures and Algorithm Analysis in C, Mark Allen Weiss, Second Edition, 2002, Pearson.
2. Introduction to Algorithms, Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, Clifford Stein, Third Edition, 2010, PHI.
3. Data Structures and Algorithms Made Easy by Narasimha Karumanchi, 2020, CareerMonk Publications.

#### **e-Resources & other digital material**

1. <https://www.cs.usfca.edu/~galles/visualization/Algorithms.html>
2. <http://www.algomatic.com/algorithm/single-linked-list-insert-delete>
3. <http://www.algomatic.com/algorithm/binary-tree-insert-delete-display>
4. <https://www.youtube.com/watch?v=AfYqN3fGapc>
5. <https://www.youtube.com/watch?v=7vw2iIdqHIM>
6. <http://littlesvr.ca/dsa-html5-animations/sorting.php>