# PVP SIDDHARTHA INSTITUTE OF TEHNOLOGY, KANURU, VIJAYAWADA (AUTONOMOUS)

## INFORMATION TECHNOLOGY

Data Structures Lab (Common to CSE & IT)

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

	Course Outcomes					
Upon successful completion of the course, the student will be able to						
CO1	Apply Linear and non-linear data structures for solving problems.	L2				
CO2	Implement programs as an individual on different IDEs	L3				
CO3	Develop an effective report based on various programs implemented	L3				
CO4	Apply technical knowledge for a given problem and express with an effective oral communication	L3				
CO5	Analyze outputs using given constraints/test cases	L4				

# Contribution of Course Outcomes towards achievement of Program Outcomes & Strength of correlations (3:Substantial, 2: Moderate, 1:Slight)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3											2	3	3
CO2	3				3									
CO3	3													
CO4	3									3				
CO5		3												

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

### **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.algomation.com/algorithm/single-linked-list-insert-delete
- 3. http://www.algomation.com/algorithm/binary-tree-insert-delete-display
- 4. https://www.youtube.com/watch?v=AfYqN3fGapc
- 5. https://www.youtube.com/watch?v=7vw2iIdqHlM
- 6. http://littlesvr.ca/dsa-html5-animations/sorting.php