

ADVANCED DATA STRUCTURES AND ALGORITHM ANALYSIS LAB

Course Code:	23CS3351	Year:	II	Semester:	I
Course Category:	Professional Core Course	Branch:	CSE	Course Type:	Practical
Credits:	1.5	L-T-P:	0-0-3	Prerequisites:	Data Structures through C / Object Oriented Programming
Continuous Internal Evaluation:	30	Semester End Evaluation:	70	Total Marks:	100

COURSE OUTCOMES

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

CO1	Implement programs as an individual on different IDEs/ online platforms.	L3
CO2	Apply different design techniques for solving problems.	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

Unit No.	SYLLABUS CONTENTS	Mapped CO
1	a) Implement AVL Trees and its operations. b) Develop a solution to the given problem using AVL Trees.	CO1, CO2, CO3, CO4, CO5
2	a) Implement B- Trees and its operations. b) Develop a solution to the given problem using B- Trees.	CO1, CO2, CO3, CO4, CO5
3	a) Implement Binary Heap and its operations. b) Develop a solution to the given problem using Binary Heaps.	CO1, CO2, CO3, CO4, CO5
4	a) Implement Graph and its operations. b) Develop a solution to the given problem using Graphs.	CO1, CO2, CO3, CO4, CO5
5	Develop and implement an algorithm using Divide and Conquer strategy for a given set of problems.	CO1, CO2, CO3, CO4, CO5
6	Make use of Greedy method to implement a solution for a given problem.	CO1, CO2, CO3, CO4, CO5
7	Develop and implement an efficient solution using Dynamic Programming.	CO1, CO2, CO3, CO4, CO5
8	Use Backtracking design technique to implement a solution for a given problem.	CO1, CO2, CO3, CO4, CO5
9	Develop and implement an algorithm using Branch and Bound technique for solving a given problem.	CO1, CO2, CO3, CO4, CO5
10	Case Study-1: Apply the most appropriate design technique to develop and implement an efficient solution for a given problem.	CO1, CO2, CO3, CO4, CO5
11	Case Study-2: Develop and implement an optimal solution for a given problem by applying a suitable design technique.	CO1, CO2, CO3, CO4, CO5

Learning Resources**Text Books**

1. Fundamentals of Data Structures in C++, Horowitz, Ellis; Sahni, Sartaj; Mehta, Dinesh, 2nd Edition Universities Press
2. Computer Algorithms in C++, Ellis Horowitz, Sartaj Sahni, Sanguthevar Rajasekaran, 2nd Edition University Press

References Text Book

1. Introduction to the Design & Analysis of Algorithms, Anany Levitin, Third Edition, 2011, Pearson Education.
2. Data Structures and Algorithm Analysis in C, Mark Allen Weiss, 2002, Pearson.
3. Algorithm Design Techniques, Narasimha Karumanchi, CareerMonk Publications, 2018.

e-Resources and other Digital Material

1. <https://www.cs.usfca.edu/~galles/visualization/Algorithms.html>
2. <http://littlesvr.ca/dsa-html5-animations/sorting.php>
3. <https://www.youtube.com/watch?v=AfYqN3fGapc>