INSTITUTE OF ENGINEERING & MANAGEMENT

SALT LAKE, KOLKATA

LAB MANUAL

Year : 2022 - 2026

Course Name : Data Structure & Algorithms Lab

Course Code : BTHPCCCCS391

Semester : III

Branch : CSBS

Data Structure & Algorithms Lab (BTHPCCCS391)

Name: ……..

University Roll No: ……Class Roll……

Year: …… Semester: ……

Session: ……

General Information

Name	Data Structure & Algorithm Lab	**Semester**	5th
Course Code	BTHPCCCS391	**Year with stream**	2nd year CSBS
Course Credit	2	**Session**	
Faculty Instructor/s		**Class hours and total class load**	
Technical assistant/s		**Laboratory**	

Course objectives	1. To be familiar with ADT concept to process and represent data. 2. To be able to analyze different algorithms. 3. To be familiar with several well-known sorting algorithms i.e. heap sort,quick sort, merge sort, bubble sort, selection sort, insertion sort 4. To be familiar with well-known searching algorithm like linear search andbinary search 5. To employ the different data structures to find the solutions for specificproblems

CO1	Represent data for efficient processing using the fundamental concept of Data Structure.
CO2	Develop applications using the search algorithms and sorting algorithms based on their time complexities.
CO3	Implement linear data structure like stack, queue and Linked List for different requirements.
CO4	Develop applications using concepts of different trees and graphs.
CO5	Evaluate the performance of an algorithm in terms of complexity using asymptotic notation.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1												
CO2												
CO3												
CO4												
CO5												

Safety Norms and precautions	
Do's	1.It is a responsibility to read safety and fire alarm posters and follow the instructions during an emergency 2.Know the location of the fire extinguisher, eye wash, and safety shower in your lab and know how to use them. 3.Obtain permission before operating any high voltage equipment. 4.Clean your lab bench and equipment, and lock the door before you leave the laboratory.
Do not's	1. Never eat, drink, or smoke while working in the laboratory. 2.Avoid using extension cords whenever possible. If you must use one, obtain a heavy- duty one that is electrically grounded, with its own fuse, and install it safely. Extension cords should not go under doors, across aisles, be hung from the ceiling, or plugged into other extension cords. 3.Never do unauthorized experiments.

Course policies
1. Attendance Attendance is compulsory. Please be respectful to your classmates by being on time. Cell phones should be turned off and kept out of sight.
2. Plagiarism Collaboration on performing the experiments and taking measurements is strongly encouraged; however, the lab report you hand in must be solely your own. Sharing written work beforehand is considered as academic dishonesty
3. Disability Support If you have a disabling condition which may interfere with your ability to successfully complete this module, please contact Faculty in charge
4. Make-up Experiment Make-up for a missing experiment will not be offered, normally. The only exceptions to that are illness or emergency (e.g., death in family, a traffic accident, etc.), in which case you may contact your faculty in charge.
5. Beyond Syllabus Experiment As per policy you have to perform at least two innovative experiments from the list of innovative experiments to be provided
6.Micro Project As per policy you have to perform at least one micro project in this lab preferably innovative and lab oriented.
7. Experiment in virtual laboratory As per policy you have to perform at least two virtual experiments

Course assessment process
Continuous assessment
Lab reports [20%] Experiment number, Objective, theory, procedure, results, discussion and conclusion
Lab applications & attendance [10%] Performance on method of working, tit-rating, reading data, tabulating data, plotting graph, attendance etc.
Questions and quizzes at the end of each experiment (10%)
Assessment during end semester examination
Lab examination [40%] Experiments are allotted to the students randomly on lottery basis during examination time which they have to complete within stipulated time.
Viva [20%] There is a 10-minute viva-voce during examination time.

Grading Scale	
Grade	***Percent score***
O	*90%-100 %*
E	*80%-89%*
A	*70%-79%*
B	*60%-69%*
C	*50%-59%*
F	*Below 40%*

List of Assignments:

Date of Expt	*Expt No.*	*Name of Experiment*	*Page Number*	*Signature*	*Grade awarded*
	1	Write A Program To Sort An Array Using Bubble Sort, Selection Sort and Insertion Sort			
	2	Write A Program To Sort An Array Using Merge Sort, Quick Sort			
	3	Write Programs To Perform Linear Search & Binary Search			
	4	Write A Program to Perform Addition, Multiplication And Transpose operations on Matrix			
	5	Write A Program To Create A Linked List And Perform Insertion, Deletion And TraversingOperation On That Linked List			
	6	Implement Queue As Linked List			
	7	Implement Stack using Array and using Linked List			
	8	Write a Program To Convert An Infix To Postfix Expression			
	9	Write A Program To Solve Tower of Hanoi Problem			
	10	Write a program to implement BST			
	11	Write program to evaluate Pre order, In order and post order traversal from a given tree			
	12	Implement BFS			
	13	Implement DFS			
		Beyond Syllabus Assignment			
		Micro Project			

Assignment No:

Title:

Objective:

Problem Statement:

Methodology/ Algorithm /Data Structure/ Design:

Output and Program :

Conclusion/ Discussions:

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Teacher's Signature with date