



# Techno College of Engineering Agartala

An Engineering College Approved by AICTE, MHRD, Govt. of India

Affiliated to Tripura University (A Central University),

Department of Computer Science & Engineering



## List of Laboratory Experiments

Data Structure Lab							
Course Code	Hours / Week				Maximum Marks		
PC CS 308	L	T	P	C	CIA	SEE	Total
	0	0	2	1	40	60	100
Number of classes: 24 Hours			Prerequisites: ES208				
Branch: CSE			Semester: III				
<b>Course overview:</b> The Data Structures Lab aims to provide hands-on experience in implementing and manipulating various data structures such as arrays, linked lists, stacks, queues, trees, and graphs. Students learn to write efficient, modular, and optimized code to solve real-world problems. The lab strengthens understanding of algorithmic logic, memory management, and performance analysis, forming a strong foundation for advanced programming, algorithm design, and software development in future courses							
<b>Course objectives:</b> <div><div>i.</div><div>To implement linear and non-linear data structures such as arrays linked lists, stacks, queues, trees, and graphs.</div><div>ii.</div><div>To develop problem-solving skills using efficient algorithms and data structure techniques.</div><div>iii.</div><div>To analyze time and space complexity of different data structure operations.</div><div>iv.</div><div>To understand dynamic memory allocation and pointer-based data manipulation.</div><div>v.</div><div>To apply data structures in solving real-world and computational problems effectively.</div></div>							
<b>Course outcomes:</b>							
CO Number	CO Description						K-level
CO-1	Analyze the algorithms to determine the time and computation complexity.						K-3
CO-2	Solve Search problem (Linear Search and Binary Search)						K-3
CO-3	Solve problem of Stacks, Queues and linked list and analyze the same to determine the time and computation complexity						K-4
CO-4	Construct an algorithm using Selection Sort, Bubble Sort, Insertion Sort, Quick Sort, Merge Sort, Heap Sort and compare their performance in term of Space and Time complexity						K-4
CO-5	Apply Graph search and traversal algorithms and determine the time and computation complexity						K-4
Sl. No.	EXPERIMENT NAME						CO
1.	Implementation of array operations						CO-1
2.	Stacks and Queues: adding, deleting elements Circular Queue: Adding & deleting elements						CO-2
3.	Problems to solve using stacks and queues as per the theory subject Data Structure and Algorithm						CO-3



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4.	Implement different operations (insertion, deletion, searching, sorting, reversals) on Single linked list, double linked list, circular linked list.	CO-4
5.	Implement different sorting algorithms as listed in Data Structure and Algorithm subject	CO-4
6.	Implement Graph.	CO-5
7.	Perform Graph search operations	CO-5