BCSC1807: DESIGN & ANALYSIS OF ALGORITHMS LAB

Objective: *The objective of this course is that students will understand and implement simple data structures, able demonstrate different sorting and searching techniques. and will be familiar with graphs and their applications.*

Credits:01   **L-T-P-J:0-0-2-0**

Module No.	Content	Teaching Hours

I& II	• Implementation of sorting algorithms:
	  o Insertion Sort
	  o Bubble Sort
	  o Selection Sort
	• Divide and conquer approach:
	  o Quick Sort
	  o Merge Sort
	• Implementation of sorting algorithms:
	  o Heap Sort
	  o Counting Sort
	• Implementation of Searching Techniques:
	  o Linear Search
	  o Binary Search
	• Implementation of Matrix Multiplication
	• Implementation of Convex Hull
	• Implementation of Breadth First Search
	• Implementation of Depth First Search
	• Implementation of Greedy approaches:
	  o Optimal Reliability Allocation.
	  o Knapsack. Minimum
	  o Minimum Spanning trees:
	• Prim's and Kruskal's algorithms.
	  o Single source shortest paths –
	• Dijkstra's and Bellman Ford algorithms.
	• Implementation of Dynamic Programming:
	  o Longest Increasing Subsequence.
	  o Finding best path in maze.
	  o Matrix Chain Multiplication
	  o 0/1 Knapsack Problem
	  o Resource Allocation Problem
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Note: All Code must be done in Java as well as Python

Focus: This Course focuses on Employability under CO1, CO2, CO3.

Outcome: After completion of course, student will be able to:
- CO1: Implementation the sorting algorithms like Selection Sort, Bubble Sort, Insertion Sort, Merge Sort, Quick Sort and Heap Sort.
- CO2: Demonstrate and use the appropriate data structures for a given problem
- CO3: Implement the algorithms based on Greedy approach and Dynamic Programming.

Mapping of Course Outcomes (COs) with Program Outcomes (POs) and Program Specific Outcomes (PSOs):

COs	POs/PSOs
CO1	PO1,PO2,PO4/PSO1,PSO2,PSO4
CO2	PO1,PO3,PO4/PSO1,PSO2,PSO3
CO3	PO2,PO3,PO5/PSO1,PSO2,PSO4

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