

23CS12P1 –DATA STRUCTURES LABORATORY

(Common to CSE, IT, AI&DS, and allied branches)

Course Category:	Professional Core	Credits:	1.5
Course Type:	Practical	Lecture - Tutorial - Practical:	0-0-3
Prerequisite:	Knowledge in programming languages.	Sessional Evaluation:	30
		Univ.Exam Evaluation:	70
		Total Marks:	100
Objectives	The course aims to strengthen the ability of the students to identify and apply the suitable data structure for the given real-world problem. It enables them to gain knowledge in practical applications of data structures.		

Course Outcomes	At the end of the course, Student will be able to	
	CO1	Explain the role of linear data structures in organizing and accessing data efficiently.
	CO2	Design, implement, and apply linked lists for dynamic data storage, demonstrating understanding of memory allocation.
	CO3	Develop programs using stacks and queues to handle recursive algorithms, manage program states, and solve related problems.
	CO4	Devise solutions to small scale programming challenges involving data structures such as Trees, Binary search trees and Height-balanced trees.
	CO5	Describe the fundamentals of graphs and recognize scenarios where hashing is an advantage, and design hash-based solutions for specific problems.
Course Content	<u>LIST OF EXPERIMENTS</u>	
	Exercise 1: Example programs on Array Manipulation	
	Exercise 2: Implementation of Linked List Operations	
	Exercise 3: Implementation of any two applications on Linked Lists .	
	Exercise 4: Implementation of Double Linked List operations and applications.	
	Exercise 5: Implementation of Stack Operations using Arrays and Linked Lists.	
	Exercise 6: Implementation of Queue Operations using Arrays and Linked Lists.	
	Exercise 7: Implementation of Stack and Queue Applications	
	Exercise 8: Implementation of Binary Search Tree using Linked List.	
	Exercise 9: Implementation of Hash table with collision resolution techniques.	
	Exercise 10: Implementation of Simple Cache using hashing.	

Text Books and References	<p>Text Books:</p> <ol style="list-style-type: none"> 1. Data Structures, Algorithms, and Software Principles in C, Thomas A Standish, Addison-Wesley Publishing Company, 1995. 2. Data Structures and algorithm analysis in C, Mark Allen Weiss, Pearson, 2nd Edition. 2. Fundamentals of data structures in C, Ellis Horowitz, SartajSahni, Susan AndersonFreed, Silicon Press, 2008 <p>Reference Books:</p> <ol style="list-style-type: none"> 1. Algorithms and Data Structures: The Basic Toolbox by Kurt Mehlhorn and Peter Sanders 2. C Data Structures and Algorithms by Alfred V. Aho, Jeffrey D. Ullman, and John E. Hopcroft 3. Problem Solving with Algorithms and Data Structures" by Brad Miller and David Ranum 4. Introduction to Algorithms by Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, and Clifford Stein 5. Algorithms in C, Parts 1-5 (Bundle): Fundamentals, Data Structures, Sorting, Searching, and Graph Algorithms by Robert Sedgewick
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