



DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
LESSON PLAN

Course Code	Course Name	Regulation	Academic year	Year / Semester	Branches	Contact Periods/Week	Sections
23CS2T01	Data Structures	R23	2024- 2025	B.Tech / II Sem	Common to CSE, IT,AI&ML, CSE-DS,CSE-CS,CSE-BS,AIDS	5	All

COURSE OUTCOMES

At the end of the course, student will be able to

CO1: Acquire the basic concepts of data structures in organizing and accessing data efficiently in algorithms. **(K2)**

CO2: Design, implement, and apply linked lists for dynamic data storage, demonstrating understanding of memory allocation. **(K3)**

CO3: Develop programs using stacks to handle recursive algorithms, manage program states, and solve related problems. **(K3)**

CO4: Apply queue-based algorithms for efficient task scheduling and breadth-first traversal in graphs and distinguish between deques and priority queues, and apply them appropriately to solve data management challenges. **(K4)**

CO5: Devise novel solutions to small scale programming challenges involving data structures such as stacks, queues, Trees. **(K3)**

CO6: Design hash-based solutions for specific problems. **(K2)**

UNIT- I

Unit No.	Course Outcomes	Topics/Activity	Ref Text Book	No. of Periods	Total Periods	Delivery Method	
1	CO1: Acquire the basic concepts of data structures in organizing and accessing data efficiently in algorithms. (K2)	Introduction to Data Structures					Lecture, Assignment, Interaction
		1.1	Definition	T1, R2	1	14	
		1.2	Classification of data structures	T1, R2	1		
		1.3	Abstract data types (ADTs) and their implementation	T1, R2	1		
		1.4	Overview of time and space complexity analysis	T1, R2	1		
		1.5	Searching Techniques: Linear	T1, R2	1		
		1.6	Binary Search	T1, R2	1		
		1.7	Sorting Techniques: Bubble sort,	T1, R2	1		

		1.8	Selection sort,	T1, R2	1		
		1.9	Insertion Sort	T1, R2	1		
		1.10	Quick Sort	T1, R2	2		
		1.11	Merge Sort	T1, R2	2		
		1.12	Time Complexity Ananalysis for Sorting Techniques	T1, R2	1		

UNIT- II

Unit No.	Course Outcomes	Topics/Activity	Ref Text Book	No. of Periods	Total Periods	Delivery Method	
2	CO2:Design, implement, and apply linked lists for dynamic data storage, demonstrating understanding of memory allocation. (K3)	Linked Lists				10	Lecture, Assignment, Interaction
		2.1	Singly linked lists: representation	T2,R3	3		
		2.2	Operations	T2, R3			
		2.3	Doubly linked lists	T2, R3	2		
		2.4	Circular linked lists,	T2, R3	2		
		2.5	Comparing arrays and linked lists	T2, R3	2		
		2.6	Applications of linked lists.	T2, R3	1		
		MID I EXAMINATION 18th week					

UNIT- III

Unit No.	Course Outcomes	Topics/Activity	Ref Text Book	No. of Periods	Total Periods	Delivery Method	
3	CO3:Develop programs using stacks to handle recursive algorithms, manage program states, and solve related problems. (K3)	Stacks				12	Lecture, Assignment, Interaction
		3.1	Introduction to stacks: properties and operations,	T2,R3	4		
		3.2	implementing stacks using arrays and linked lists	T2,R3			
		3.3	Applications of stacks: reversing list and Factorial Calculation	T2,R3	2		
		3.4	expression evaluation,	T2,R3	2		
		3.5	backtracking,	T2,R3	2		
		3.6	reversing list and factorial calculation.	T2,R3	2		

UNIT- IV

Unit No.	Course Outcomes	Topics/Activity	Ref Text Book	No. of Periods	Total Periods	Delivery Method	
4	CO4: Apply queue-based algorithms for efficient task scheduling and breadth-first traversal in graphs and distinguish between dequeues and priority queues, and apply them appropriately to solve data management challenges. (K4)	Queues				15	Lecture, Assignment, Interaction
		4.1	Introduction to queues: properties	T2,R3,R2	2		
		4.2	operations	T2,R3,R2	1		
		4.3	implementing queues using arrays and linked lists,	T2,R3,R2	3		
		4.4	circular queue	T2,R3,R2	2		
		4.5	priority queue	T2,R3,R2	2		
		4.6	Applications of queues in breadth-first search, scheduling.	T2,R3,R2	2		
		4.7	Dequeues: Introduction to dequeues (double-ended dequeues),	T2,R3,R2	1		
4.8	Operations on dequeues and their applications	T2,R3,R2	2				

UNIT- V

Unit No.	Course Outcomes	Topics/Activity	Ref Text Book	No. of Periods	Total Periods	Delivery Method	
5	CO5: Devise novel solutions to small scale programming challenges involving data structures such as stacks, queues, Trees. (K3) CO6: Design hash-based solutions for specific problems. (K2)	Trees				16	Lecture, Assignment, Interaction
		5.1	Introduction to Trees	T2,R2,R3	2		
		5.2	Properties of Trees	T2,R2,R3	1		
		5.3	Binary Search Tree – Insertion, Deletion & Traversal Graphs.	T2,R2,R3	2		
		5.4	Introduction to graphs, properties	T2,R2,R3	1		

	5.5	representation, Traversal	T2,R2,R3	2	
	Hashing				
	5.6	Brief introduction to hashing	T2,R2,R3	1	
	5.7	Collision resolution techniques: chaining	T2,R2,R3	1	
	5.8	open addressing,	T2,R2,R3	1	
	5.9	Hash tables: basic implementation	T2,R2,R3	1	
	5.10	operations,	T2,R2,R3	2	
	5.11	Applications of hashing in unique identifier generation,	T2,R2,R3	1	
	5.12	caching.	T2,R2,R3	1	
Total no. of periods					67
MID - II Examination during 14th Week					
END EXAMINATIONS					

TEXT BOOKS


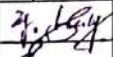



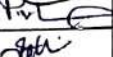







- T1. Mark Allen Weiss, Data Structures and Algorithms in C, Pearson, 2nd Edition.
T2. Ellis Horowitz, Sartaj Sahni, Susan Anderson-Freed, Fundamentals of data structures in C, Silicon Press, 2008

REFERENCE BOOKS

- R1. Kurt Mehlhorn and Peter Sanders, Algorithms and Data Structures: The Basic Toolbox , Springer; 2008 edition.
R2. Brad Miller and David Ranum, " Problem Solving with Algorithms and Data Structures" , Franklin, Beedle & Associates (2011) .
R3. Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, and Clifford Stein , Introduction to Algorithms, Third Edition, 2009.

WEB LINKS

- <https://www.geeksforgeeks.org/datastructures/>
<https://www.javatpoint.com/data-structure-tutorial>
https://www.w3schools.com/dsa/dsa_intro.php
<https://www.techtarget.com/searchdatamanagement/definition/data-structure>

S.No.	Course Lecturer	Branch & Section	Sign
1	Mr. K.John Paul	CSE - D & I	
2	Ms. Y.Sherly Priscilla	CSE - A & H	
3	Mr. A.Satish	AIDS	
4	Ms. V.Anusha	AIML -A & B	
5	Mrs. M. Sumalatha	CSE - E & G	
6	Mrs. V.P.V Kumari	DS - A & B	
7	Mrs. K. Swathi	IT- B	
8	Mrs. G.Swapna	CSE - B & F	
9	Mrs. B. Sri lakshmi	CCS	
10.	Ms. M. Teja Sree	IT-A	
11.	Ms. D. Swathi	CBS	
12.	Ms. M. Doctor Pranati	CSE - C	
Course Coordinator		Mr. K.John Paul	


Course Coordinator


HOD


Principal