



SWARNANDHRA

COLLEGE OF ENGINEERING & TECHNOLOGY

(AUTONOMOUS)

Accredited by National Board of Accreditation, AICTE, New Delhi, Accredited by NAAC with "A" Grade – 3.32 CGPA, Recognized under 2(f) & 12(B) of UGC Ad 1956, Approved by AICTE, New Delhi, Permanent Affiliation to JNTUK, Kakinada Seetharampuram, W.G.DT., Narsapur-534280, (Andhra Pradesh)

DEPARTMENT OF INFORMATION TECHNOLOGY

TEACHING PLAN

Course Code	Course Title	Semester/Regulation	Branch	Contact Periods /Week	Academic Year	Date of commencement of Semester
20AM3T01	Data Structures	III(R20)	CSE-DS, AI&DS	6	2023-2024	07-08-23
COURSE OUTCOMES						
1	Design applications using Stacks and implement various types of Queues.					
2	Analyze and implement operations on Linked lists and demonstrate their applications.					
3	Implement various operations on Binary trees.					
4	Implement various Searching and Sorting techniques.					
5	Demonstrate the implementation of various types of Graphs and Graph Traversals.					
UNIT	Out Comes / Bloom's Level	Topics No.	Topics/ Activity	Text Book/ Reference	Contact Hour	Delivery Method
I	CO - 1	1.1	Introduction: Data vs information	T1,T2	1	Chalk & Board Power point presentations Assignment Test
		1.2	Classification of data structures	T1,T2	1	
		1.3	Preliminaries of algorithm	T1,T2	1	
		1.4	Abstraction	T1,T2	1	
		1.5	Abstraction data type(ADT)	T1,R1	1	
		1.6	Introduction to arrays	T1,R1	1	
		1.7	Array characteristics	T1,R1	1	
		1.8	Storage representation of arrays	T1,R1	1	
		1.9	Array order reversal	T1,R1	1	
		1.10	Recursion in arrays	T1,R1	1	
		1.11	Array operations	T1,T2	1	
		1.12	Algorithms	T1,T2	1	
		1.13	Complexity	T1,T2	1	
		1.14	Time and space trade off	T1,T2	1	
Content beyond syllabus			Dictionaries	R2	1	
Total					14	



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II	CO – 2	2.1	Linked Lists: Introduction, Array vs linked list, Single linked list	T1,R2	1	Chalk & Board Power point presentations Assignment Test
		2.2	representation of a linked list in memory	T1,R2	1	
		2.3	Operations on a single linked list- Creation and insertion	T1,R2	1	
		2.4	Operations on a single linked list- Insertion	T1,R2	1	
		2.5	Operations on a single linked list-Deletion	T1,R2	1	
		2.6	Operations on a single linked list-Deletion	T1,R2	1	
		2.7	Operations on a single linked list- Merging and reverse	T1,R2	1	
		2.8	Polynomial Manipulation using list	T1,R2	1	
		2.9	Advantages and Disadvantages of single linked list	T1,R2	1	
		2.10	Circular linked list	T1,R2	1	
		2.11	Double linked list	T1,R2	1	
		2.12	Circular double linked list	T1,R2	1	
Content beyond syllabus		2.13	Implementation of stack using linked list	R1	1	
		2.14	Implementation of queue using linked list	R1	1	
Total					14	
III	CO – 3	3.1	Stacks and Queues: introduction	T1,R2	1	Chalk & Board Power point presentations Assignment
		3.2	Array representation of stack	T1,R2	1	
		3.3	Linked list representation of a stack	T1,R2	1	
		3.4	Stack operations	T1,R2	1	
		3.5	Algorithm for stack operations	T1,R2	1	
		3.6	Stack applications	T1,R2	1	
		3.7	Tower of honoi ,infix to postfix transformation	T1,R2	1	
		3.8	Evaluating arithmetic expressions	T1,R2	1	



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		3.9	Queues: introduction	T1,T2	1	Test
		3.10	Array representation of queue	T1,T2	1	
		3.11	Linked list representation of queue	T1,R2	1	
		3.12	Queue operations	T1,T2	1	
		3.13	Algorithm for queue operations	T1,T2	1	
		3.14	Queue applications	T1,T2	1	
		3.15	Priority queue	T1,T2	1	
	Content beyond syllabus	3.16	AVL Trees	R2	1	
Total					16	
IV	CO - 4	4.1	Trees & Graphs: preliminaries of tree ADT	T1,R2	1	Chalk & Board
		4.2	Binary trees	T1,R2	1	
		4.3	The search tree ADT	T1,R2	1	
		4.4	Binary search trees	T1,R2	1	
		4.5	AVL trees, tree Traversals	T1,R2	1	
		4.6	B -trees ,heap tree	T1,R2	1	Power point presentations
		4.7	Preliminaries of graph ADT	T1,R2	1	
		4.8	Representation of graph	T1,R2	1	
		4.9	Graph traversal	T1,R2	1	
		4.10	BFS,DFS	T1,R2	1	Assignment
		4.11	Application of graph	T1,R2	1	
4.12	Shortest path algorithms	T1,R2	1			
		4.13	Dijktras algorithms	T1,R2	1	Test
		4.14	Minimum spanning tree	T1,R2	1	
		4.15	Prims algorithms	T1,R2	1	
	Content beyond syllabus	4.16	Travelling sales person problem	R3	1	
Total					16	
CO-5		5.1	Algorithm Design Techniques & Searching and Sorting Techniques: Divide and conquer strategy	T1,T3	1	Chalk & Board Power point



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	5.2	Greedy algorithm	T1,T3	1	presentations Assignment Test
	5.3	Dynamic programming	T1,T3	1	
	5.4	Backtracking strategy	T1,T3	1	
	5.5	List searches using linear search	T1,T3	1	
	5.6	Binary search	T1,T3	1	
	5.7	Fibonacci search	T1,T3	1	
	5.8	Sorting: Insertion sort	T1,T3	1	
	5.9	Heap sort	T1,T3	1	
	5.10	Bubble sort	T1,T3	1	
	5.11	Quick sort	T1,T3	1	
	5.12	Merge sort	T1,T3	1	
	5.13	Analysis of sorting techniques	T1,T3	1	
Total				13	
CUMULATIVE PROPOSED PERIODS				73	
Text Books:					
S.No	AUTHORS, BOOK TITLE, EDITION, PUBLISHER, YEAR OF PUBLICATION				
1	Richard F. Gilberg and Behrouz.A. Forouzan, Data Structures: A Pseudo code approach with C, 2nd edition, Cengage, 2012				
2	Debasissamanta , Classic Data Structures, 2 nd edition, 2 nd Edition, 2016				
3	Yashavant Kanetker, Data Structures through C, 2 nd edition, BPB publications, 2017				
Reference Books:					
S.No.	AUTHORS, BOOK TITLE, EDITION, PUBLISHER, YEAR OF PUBLICATION				
1	Seymour Lipschutz , Data Structure with C, TMH, 2017				
2	G. A. V. Pai, Data Structures and Algorithms, TMH, 2017				
3	Horowitz, Sahni, Anderson Freed, Fundamentals of Data Structure in C, 2 nd Edition, University Press, 2018				
Web Details:					
1	https://www.geeksforgeeks.org/data-structures/				
2	https://www.tutorialspoint.com/data_structures_algorithms/data_structures_basics.htm				
3	https://www.programiz.com/dsa				
4	https://www.javatpoint.com/data-structure-tutorial				



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	Name	Signature with Date
i. Faculty	G.Jhansi	
ii. Module Coordinator	Dr.G.Sudhakar	
iii. Programme Coordinator	Dr.B.Ramakrishna	

Principal

