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 Act 19
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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
20CS3T01	Data Structures	III (R20)	IT	6	2023-2024	07/08/2023

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	Demonstrate the implementation of various types of Graphs and Graph Traversals.
5	Implement various Searching and Sorting techniques.

UNIT	Out Comes / Bloom's Level	Topic No.	Topics/ Activity	Text Book/ Reference	Contact Hour	Delivery Method
I	CO – 1	1.1	**Introduction:** Introduction & Definition of data structure	T1,T2	1	Chalk & Board Power point presentations Assignment Test
		1.2	Types and overview of data structures	T1,T2	1	
		1.3	**Algorithm:** Preliminaries of algorithm	T1,T2	1	
		1.4	Algorithm analysis and complexity	T1,T2	1	
		1.5	Stack Representation using Arrays	T1,R1	1	
		1.6	operations on stack	T1,R1	1	
		1.7	Applications of stacks - Factorial Calculation, Infix to postfix conversion algorithm	T1,R1	1	
		1.8	Infix to postfix Transformation examples	T1,R1	1	
		1.9	Evaluating Arithmetic Expressions	T1,R1	1	
		1.10	Queue Representation using Arrays	T1,R1	1	
		1.11	operations on queues	T1,T2	1	
		1.12	Applications of queues	T1,T2	1	
		1.13	Circular queues	T1,T2	1	
		1.14	Priority queues	T1,T2	1	
		1.15	Implementation of queue using stack	T1,T2	1	

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Content beyond syllabus		1.16	Dictionaries	R2	1	
				Total	16	
II	CO – 2	2.1	**Linked Lists:** Introduction, 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- Merging and reverse	T1,R2	1	
		2.7	Applications of single linked list	T1,R2	1	
		2.8	Double linked list, Operations	T1,R2	1	
		2.9	Operations on a double linked list	T1,R2	1	
		2.10	Circular linked list	T1,R2	1	
		2.11	Operations on a circular linked list	T1,R2	1	
Content beyond syllabus		2.12	Implementation of stack using linked list	R1	1	
		2.13	Implementation of queue using linked list	R1	1	
				Total	**13**	
III	CO – 3	3.1	**Trees:** Basic tree concepts	T1,R2	1	Chalk & Board Power point presentations Assignment Test
		3.2	Tree terminologies	T1,R2	1	
		3.3	**Binary Trees:** Properties	T1,R2	1	
		3.4	Representation of Binary Trees using Arrays and Linked List	T1,R2	1	
		3.5	Binary Tree Traversals	T1,R2	1	
		3.6	Binary Tree Traversals	T1,R2	1	
		3.7	Creation of binary tree from in, pre and post order traversals	T1,R2	1	
		3.8	Threaded binary tree	T1,R2	1	
		3.9	**Binary search trees:** Basic concepts	T1,T2	1	
		3.10	BST operations: Search, insertion	T1,T2	1	
		3.11	deletion and traversals	T1,R2	1	
		3.12	Creation of binary search tree from in-order and pre	T1,T2	1	

Code :

Unit / Item No.		Topic	Book Reference	No. of periods	

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			(post)order traversals			
		3.13	AVL Trees	T1,T2	1	
				Total	**13**	
IV	CO – 4	4.1	**Graphs:** Basic concepts	T1,R2	1	Chalk & Board Power point presentations Assignment Test
		4.2	Representations of Graphs: using Linked list	T1,R2	1	
		4.3	Representations of Graphs: using adjacency matrix	T1,R2	1	
		4.4	Graph Traversals - BFS	T1,R2	1	
		4.5	Graph Traversals – DFS	T1,R2	1	
		4.6	Dijkstra's shortest path algorithm	T1,R2	1	
		4.7	Spanning Tree and Minimum Spanning Tree	T1,R2	1	
		4.8	Minimum Spanning Tree using Prim's algorithm	T1,R2	1	
		4.9	Minimum Spanning Tree using Kruskal's algorithm	T1,R2	1	
		4.10	Transitive closure	T1,R2	1	
		4.11	Warshall's algorithm	T1,R2	1	
Content beyond syllabus		4.12	Travelling sales person problem	R3	1	
				Total	**12**	
V	CO-5	5.1	**Searching:** Linear Search	T1,T3	1	Chalk & Board Power point presentations Assignment Test
		5.2	Binary Search	T1,T3	1	
		5.3	Fibonacci search	T1,T3	1	
		5.4	**Sorting:** Bubble Sort	T1,T3	1	
		5.5	Selection Sort	T1,T3	1	
		5.6	Insertion Sort	T1,T3	1	
		5.7	Quick Sort	T1,T3	1	
		5.8	Merge Sort	T1,T3	1	
		5.9	Radix sort	T1,T3	1	
		5.10	Hashing Introduction, Hash function	T1,T3	1	
		5.11	Collision Resolution Techniques: Linear Probing	T1,T3	1	
		5.12	Quadratic Probing	T1,T3	1	
		5.13	Double Hashing	T1,T3	1	
		5.14	Rehashing	T1,T3	1	
		5.15	Separate Chaining	T1,T3	1	
		5.16	Extendible Hashing	T1,T3	1	
				Total	**16**	
			CUMULATIVE PROPOSED PERIODS		**70**	

No. of periods	Unit / Item No.	Topic	Book Reference	No. of periods

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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, 2nd edition, 2nd Edition, 2016
3	Yashavant Kanetker, Data Structures through C, 2nd 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, 2nd 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

		Name	Signature with date
i.	Faculty	Mr. CH. R K Raju	7/8/23
ii.	Module Coordinator	Mr. CH. R K Raju	7/8/23
iii.	Programme Coordinator	Dr. RVVSV Prasad	7/8/23

Principal