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 1956,
Approved by AICTE, New Delhi, Permanent Affiliation to JNTUK, Kakinada
Seetharampuram, W.G.DT., Narsapur-534280, (Andhra Pradesh)

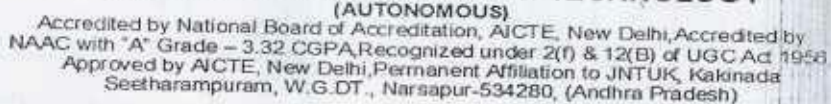## DEPARTMENT OF INFORMATION TECHNOLOGY

TEACHING PLAN

Course Code	Course Title	Semester	Branch	Contact Periods /Week	Academic Year	Date o commence
20CS3T01	DATA STRUCTURES	III	CSE-BS	6	2023-2024	07-08-2

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	Demonstrate operations on trees.
4	Demonstrate implementation of various types of Graphs and Graph Traversals.
5	Implement various searching and sorting techniques.

UNIT	Out Comes	Topic S. No.	Topics/ Activity	Text Book/ Ref	Contact Hour	Delive Metho
			Introduction to Data Structures and Algorithms			
		1.1	Definition of data structure	T1	1	
		1.2	types of data structures	T1	1	
		1.3	types and overview of data structures	T1	1	
		1.4	Preliminaries of algorithm, Algorithm analysis and complexity	T1	2	
			Stacks and Queues			Chal &
I	CO – 1	1.5	Stack Representation using Arrays, operations on stack,	T1	1	Boar
		1.6	Applications of stacks - Factorial Calculation, Infix to postfix Transformation, Evaluating Arithmetic Expressions.	T1	2	Power presenta
		1.7	Queue Representation using Arrays, operations on queues.	T1	2	Assignn
		1.8	Applications of queues, Circular queues,	T1	2	Tes
		1.9	Priority queues, Implementation of queue using stack.	T1	2	
Content beyond syllabus		1.10	Operations on Circular Queues and Priority queues	T1	1	
				Total	15	

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II	CO – 2	**Introduction to Linked Lists**				Chall & Boar
		2.1	Single linked list, representation of a linked list in memory, Operations on a single linked list.	T1, T2	3	Power p presenta
		2.2	Double linked list, Operations on a double linked list.	T1, T2	2	
		2.3	Circular linked list, Operations on a circular linked list.	T1, T2	2	Assignn Test
		2.4	Applications of single linked list	T1, T2	2	
Content beyond syllabus		2.5	Additional examples on linked lists	T1, T2	1	
				Total	11	
III	CO – 3	**Trees & Binary Trees**				
		3.1	Basic tree concepts.	T1, T2	1	
		3.2	Properties, Representation of Binary Trees using Arrays and Linked List,	T1, T2	2	
		3.3	Binary Tree Traversals,	T1, T2	2	
		3.4	Creation of binary tree from pre-order, in-order and post order traversals.	T1, T2	2	Cha & Boa
		3.5	threaded binary tree.	T1, T2	1	
		Binary search trees & AVL Trees				
		3.4	Basic concepts,	T1, T2	1	Power
		3.5	BST operations: Search, insertion, deletion and traversals	T1, T2	2	presenta
		3.6	Creation of binary search tree from in-order and pre (post)order traversals.	T1, T2	2	Assign Te
		3.7	AVL Trees: Self Balanced Trees,	T1, T2	1	
		3.8	Height of an AVL Trees	T1, T2	1	
		3.9	AVL Tree Rotations.	T1, T2	1	
Content beyond syllabus		3.10	Radix Trees Introduction	T1, R2	1	
					17	
IV	CO – 4	**Graphs**				
		4.1	Basic concepts, Representations of Graphs: using Linked list and adjacency matrix,	T1, T3	2	Cha & Boa
		4.2	Graph Traversals - BFS & DFS,	T1, T3	2	
		4.3	Applications: Dijkstra's shortest path algorithm	T1, T3	2	Power presen
		4.4	Minimum Spanning Tree using Prims's algorithm and Kruskal"s algorithm,	T1, T3	2	Assig T
		4.5	Transitive closure, Warshall"s algorithm.	T1, T3	2	
Content beyond syllabus		4.6	Single Source Shortest Path algorithm	T1, T3	1	
				Total	11	

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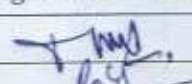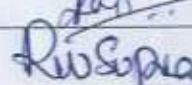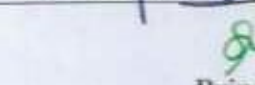COLLEGE OF ENGINEERING & TECHNOLOGY
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			Searching, Sorting & Hashing			
V	CO – 5	5.1	Linear Search, Binary Search and Fibonacci search.	T1,T3	1	Ch & Bo Power presen Assig Te
		5.2	Sorting: Bubble Sort, Selection Sort, Insertion Sort, Quick Sort, Merge Sort and Radix sort.	T1, T3	1	
		5.3	Hashing: Introduction, Hash Function,	T1, T3	2	
		5.4	Collision Resolution Techniques: Linear Probing, Quadratic Probing,	T1, T3	1	
		5.5	Double Hashing, Rehashing,	T1, T3	1	
		5.6	Separate Chaining, Extendible Hashing.	T1, T3	2	
Content beyond syllabus		5.7	Division and Mid Square Method	T1, R1	1	
			Total		09	
			Cumulative Proposed Periods		63	

Text Books:

S.No.	AUTHORS, BOOK TITLE, EDITION, PUBLISHER, YEAR OF PUBLICATION
1	Richard F. Gilberg and Behrouz.A. ForouzanData Structures: A Pseudo code approach with C nd edition, Cengage, 2012.
2	Debasissamanta, Classic Data Structures, PHI, 2 nd edition, 2016
3	YashavantKanetker, Data Structures through C, 2 nd edition BPB publications, 2017.
4	Alfred V Aho, John E Hopcraft, Jeffery D Ullman, Data Structures & Algorithms, Pearson Education Ltd., Second Edition, 2016.

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, Sahani, Anderson Freed,Fundamentals of Data Structure in C, University Press, 2 edition, 2018.

Web Details:

1	Data Structures | DS Tutorial - javatpoint
2	Introduction to Data Structures - GeeksforGeeks
3	NPTEL :: Computer Science and Engineering - Data Structures And Algorithms

		Name	Signature with Date
i.	Faculty	Mr M.N.V.L. NARAYANA	
ii.	Module Coordinator	Mr.Ch. Rama Krishna Raju	
iii.	Programme Coordinator	Dr. RVVSV Prasad	

Principal