SWARNANDHRA
COLLEGE OF ENGINEERING & TECHNOLOGY (Autonomous)

SEETHARAMAPURAM, NARSAPUR-534280 W.G.DT. AP

DEPARTMENT OF BACHELOR OF COMPUTER APPLICATIONS(Honours)

TEACHING PLAN

Course Code	Course Title	Year/Sem	Branch	Contact hr/week	Academic Year
24BC2T05	Data Structures	I/II	BCA(Honours)	6	2024-2025

Course Objectives:

- Solve problems using data structures such as linear lists, stacks, queues, hash tables
- Be familiar with advanced data structures such as binary search trees

Course Outcome(co's) : At the end of the course, student will be able to:

CO No.	Course Outcome	Knowledge Level (K)
CO1	Implement and analyze various search and sorting algorithms, and understand list ADTs including their implementations..	K4
CO2	Implement and apply stack and queue data structures using both arrays and linked lists, and understand their real-world applications.	K4
CO3	Apply hashing techniques and collision resolution strategies to efficiently manage and retrieve data.	K4
CO4	Implement heap operations and apply heaps in problem-solving, and understand the various types of tries.	K3
CO5	Implement and analyze binary trees and binary search trees, and understand basic graph concepts and algorithms for minimum cost spanning trees.	K3

Week No	Outcome	Blooms Level		Topic / Activity	Text Books	Contact Hours	Delivery Method
				UNIT-I			
1,2	Implement and analyze various search and sorting algorithms, and understand list ADTs including their implement ations..	K4	1.1	**Searching:** Linear and Binary Search Methods.	T1	1	Chalk & Board, PPT , Interactive Whit eboarding
			1.2	**Sorting:** Selection Sort, Insertion Sort,	T1	1	
			1.3	Quick Sort, Merge Sort, Heap sort.	T1	2	
			1.4	Introduction to Data Structures: Abstract Data Types (ADTs),	T1	3	
			1.5	The List ADT:Simple Array Implementation of Lists,	T1	2	
			1.6	Simple Linked Lists,	T1	1	
			1.7	Doubly Linked Lists,	T1	1	
			1.8	Circularly Linked Lists.	T1	1	
				UNIT-II			
3,4	Implement and apply stack and queue data structures using both arrays and linked lists,	K4	2.1	**The Stack ADT:** The Stack Model	T1	2	Chalk & Board, PPT , Interactive Whit eboarding
			2.2	Implementation of Stacks, Applications of Stack.	T1	3	
			2.3	**The Queue ADT:** Queue	T1	4	

	and understand their real-world applications.			Model, Array Implementation of Queues,			
			2.4	Application of Queues, Stacks and Queue. implementation of stacks and queues using linked list.	T1	5	
Mid I Exam							
UNIT-III							
5, 6	Apply hashing techniques and collision resolution strategies to efficiently manage and retrieve data.	K4	3.1	**Hashing:** Hash Function,	T1	1	Chalk & Board, PPT , Interactive Whiteboarding
			3.2	Separate Chaining,	T1	2	
			3.3	Collision Resolution-Separate Chaining	T1	2	
			3.4	Open Addressing: Linear Probing,	T1	2	
			3.5	quadratic probing, Double Hashing, rehashing, Extendible Hashing.	T1	4	
UNIT-IV							
7,8	Implement heap operations and apply heaps in problem-solving,	K3	4.1	**Heap:** Structure Property,	T1	2	Chalk & Board,
			4.2	Heap-Order Property, Basic Heap Operations.	T1	3	

	and understand the various types of tries.		4.3	Applications: The Selection problem	T1	2	PPT , Interactive Whit eboarding
			4.4	Event Simulation.	T1	2	
			4.5	Tries, Standard Tries, Compressed Tries, Suffix Tries. (Examples only)	T1	3	
UNIT-V							
9, 10	Implement and analyze binary trees and binary search trees, and understand basic graph concepts and algorithms for minimum cost spanning trees.	K3	5.1	**Trees:** Binary Trees-traversals	T1	3	Chalk & Board, PPT , Interactive Whit eboarding
			5.2	Implementation, Expression Trees.	T1	3	
			5.3	Binary Search Trees- find, find Min and find Max, insert, delete operations.	T1	4	
			5.4	Graphs-Basic Concepts Storage Structures and Traversals, minimum cost spanning trees	T1	4	
Mid II Exam							
Total No. of Classes						**63**	

Recommended Text Books for Reading:

Text Book 1 : Data Structures and Algorithm Analysis, 4th Edition, Mark Allen Weiss, Pearson.

Text Book 2 : Data Structures: A Pseudo Code Approach with C, 2nd Edition, Richard F.Gilberg, &Behrouz A. Forouzon, Cengage.

Text Book 3 :C and Data Structures: A Snap Shot Oriented Treatise Using Live Engineering Examples, N.B.Venkateswarulu, E.V.Prasad, S Chand &Co ,2009.

References Books:

1. Data Structures, Algorithms and Applications in java, 2/e, SartajSahni, University Press.

2. Data Structures using C, 2/e, ReemaThareja

R.Sunitha

Faculty

Head of the Department

Principal