C. U. SHAH UNIVERSITY
Wadhwan City

FACULTY OF:- Computer Science
DEPARTMENT OF: - Master of Computer Applications
SEMESTER: -II
CODE: - 5CS02MDS1
NAME: – DATA STRUCTURES (DS)

Teaching and Evaluation Scheme

Subject Code	Name of the Subject	Teaching Scheme (Hours)				Credits	Evaluation Scheme							
							Theory				Practical (Marks)			
		Th	Tu	Pr	Total		Sessional Exam		University Exam		Internal		University	Total
							Marks	Hrs	Marks	Hrs	Pr/Viva	TW	Pr	
5CS02MDS1	DATA STRUCTURES (DS)	4	-	-	4	4	30	1.5	70	3	-	-	---	**100**

Objectives
- To develop proficiency in the specification, representation, and implementation of Data Structures.
- To get a good understanding of applications of Data Structures.
- To develop a base for advanced computer science study

Prerequisites
Any programming language like C

Course Outline

Sr. No.	Course Contents	Number of Hours
1	**Introduction to Data Structures :** Primitive Data Structures, Non Primitive Data Structure, String Manipulation & Pattern Matching, Storage Representation of Strings, Text Handling , KWIC Indexing	06
2	**Linear Data Structures :** Arrays, Storage Structure for Arrays, Structures & Arrays of Structures , Stack, Applications of Stacks, Polish Notation Conversion, Operation of Stacks, Queues, Circular Queue, Double Ended Queue, Simulation, Priority Queues, Pointers & Linked Allocation , Linked Linear Lists , Circularly Linked Linear Lists , Doubly Linked Linear Lists, Applications of Linked Linear Lists	17
3	**Nonlinear Data Structures :**	17

	Trees , Binary Tree, Operations on Binary Trees , Storage Representation & Manipulation of Binary Trees, Conversion of General Tree to Binary Trees, Sequential & Other Representation of Trees , Manipulation of Arithmetic Expression , Sparse Matrices , Matrix Representation of Graphs , Graphic Representation of List Structures , Other Representation of Graphs ,Breadth First Search (BFS) , Depth First Search (DFS) , Spanning Trees, Prim's Algorithm, Dijkastra's Algorithm	
4	**Sorting Techniques :** Introduction , Insertion Sort, Selection Sort , Bubble Sort , Merge Sort , Heap Sort , Quick Sort , Radix Sort , Shell Sort	4
5	**Searching Techniques :** Introduction, Sequential Searching , Binary Searching , Search Trees – Height Balanced , 2-3 Trees , Weight Balanced	4
	Total hours	48

Books Recommended:

1. An Introduction to Data Structures with Applications, **Jean-Paul Tremblay, Paul G. Sorenson**, 2nd Edittion, Publisher-Tata McGraw-Hill (2007)

2. Introduction to Algorithm, **Cormen, Leiserson, Rivest, Stein**, 2nd Edition, Publisher-PHI(2003)

Reference Books :

1. Classic Data Structures, **Debasis Samanta**, Publisher-PHI

2. Data Structures Using C++, Oxford, **Varsha H. Patil**.

3. Expert Data Structures With C, **Dr. R.B. Patel**, Publisher-Khanna Publications

4. Data Structure Using C and C++, **Y kanitkar**, Publisher-PHI

5. Data Structures Using C and C++, **Tenenbaum**, Publsiher-PHI