C. U. SHAH UNIVERSITY, WADHWAN CITY.

Faculty of: **Computer Science**
Course: **Bachelor of Computer Applications**
Semester**: II**
Subject Code**: CAM204-1C**
Subject Name: **DATA STRUCTURES**

Sr. No	Category	Subject Code	Subject Name	Teaching hours/Week			Credit hours	Credit Points	Evaluation Scheme/ Semester								Total
									Theory				Practical				
									Continuous and Comprehensive Evaluation		End Semester Exams		Internal Assessment		End Semester Exams		
				Th	Tu	Pr			Marks	Marks							
									Marks	Marks	Marks	Duration	Marks	Duration	Marks	Duration	
2	MAJOR– IV	CAM204-1C	DATA STRUCTURES	3	--	2	5	4	10 10 05	Assignment MCQ Attendance	50	2	25	1	-	-	100

AIM: To develop proficiency in problem solving and programming. • Achieve an understanding of fundamental data structures and algorithms • To get a good understanding of applications of Data Structures. • To develop a base for advanced study in Computer Science.

COURSE CONTENTS

- **Unit -1 : User Define Functions** (08 Lectures)
  [a] Introduction to UDF, Types of UDF
  [b] Call by reference, call by value
  [c] Passing array as parameters to Function.
  [d] Declaring and initializing Pointers
  [e] Advantage and disadvantage of pointers
  [f] Passing pointer to function
  [g] Relationship between pointer and arrays

- **Unit -2 : Dynamic memory allocation** (05 Lectures)
  [a] Dynamic memory allocation in C
  [b] malloc( ), calloc ( ), realloc( ) and free( ) function.
  [c] Characteristics of data structure.
  [d] Types of data structure.

- **Unit -3 : Searching and Sorting** (08 Lectures)
  [a] Linear Search, Binary Search.
  [b] Bubble sort, Selection sort, merge sort, Insertion sort

- **Unit -4 : Stack and Queue** (08 Lectures)
  [a] Introduction to stack.
  [b] Stack representation and implementation

[c] Operations on stack, push, pop, peek

[d] Application of stack.

[e] Introduction to Queue

[f] Implementation of Queue using Array.

[g] Operations on Queue: Create, add, delete

[h] Introduction and implementation of Circular queue.

[i] Introduction to De-queue.

- **Unit -5 : Linked List**   **(08 Lectures)**
  [a] Introduction to Linked List.
  [b] Representation and implementation of Singly Linked List
  [c] Traversing and searching of singly Linked List
  [d] Insertion and deletion in singly linked list,
  [e] Types of linked list

- **Unit -6 : Tree**   **(08 Lectures)**
  [a] Introduction to tree, basic terminology used in Tree.
  [b] Binary tree, properties of binary tree
  [c] Traversal of binary tree: pre, post and in-order
  [d] Concept of Binary search tree,

Arrangement of lectures duration and practical session as per defined credit numbers:

Units	Lecture Duration (In Hrs.)		Calculation of Credits (In Numbers)		Total Lecture Duration	Credit Calculation
	Theory	Practical	Theory	Practical	Theory + Practical	Theory + Practical
Unit -1	08	5			13	
Unit -2	05	3			08	
Unit -3	08	4	3	1	12	4
Unit -4	08	6			14	
Unit -5	08	6			14	
Unit -6	08	6			14	
Total	**45**	**30**	**3**	**1**	**75**	**4**

Evaluation:

Theory Marks	Practical Marks	Total Marks
75	**25**	**100**

REFERENCE BOOKS:

- *"Data Structure through C/C++",*R.B.Patel, Khanna Publication
- *"Data and File Structure"*, Trembley & Sorenson, TMH Publication
- *"Data Structure & algorithms Using C"*, R.S.Salaria, Khanna Publication
- *"Data structure through C/C++"*, Tennaunbuam
- *"Let us C"*, Y Kanetkar, BPB Publication (3rd Edition).

NPTEL COURSE (https://nptel.ac.in/):
Introduction to data structure and algorithms. IIT Delhi, Prof. Naveen Garg
- https://nptel.ac.in/courses/106102064