C. U. SHAH UNIVERSITY, WADHWAN CITY.

Faculty of: **Computer Science**
Course: **Bachelor of Computer Applications**
Semester**: IV**
Subject Code**: 4CS04ADT1**
Subject Name: **Data Structure using C**

Sr. No	Branch Code	Subject Code	Subject Name	Teaching hours/ Week			Credit hours	Credit Points	Evaluation Scheme/ Semester								Total
									Theory				Practical				
				Th	Tu	Pr			Internal Assessment		End Semester Exams		Internal Assessment		End Semester Exams		
									Marks	Duration	Marks	Duration	Marks	Duration	Marks	Duration	
1	2	4CS04ADT1	Data Structure using C	4	--	4	8	6	15(SE) 15(CE)	1Hr.	70	2½ Hrs.	50 (IP) 50 (CE)	1½ Hrs.	--	--	200

AIM :

The aim of this subject is to make student to use different type's data structure in software development. The students would be able to know searching and sorting mechanism. Student are familiar with stack, queue and tree type data structure for implementation in software development.

COURSE CONTENTS

Unit I UDF   **8 Hrs.**
- Introduction to UDF, Types of UDF.
- Call by reference, call by value.
- Passing array as parameters to Function.
- Declaring and initializing Pointers.
- Advantage and disadvantage of pointers.
- Passing pointer to function.
- Relationship between pointer and arrays

Unit II Memory allocation   **8 Hrs.**
- Dynamic memory allocation in C
- malloc( ) and calloc ( ) function.
- realloc( ) and free( ) function.
- Characteristics of data structure.
- Types of data structure.

Unit III Searching and Sorting   **8 Hrs.**
- Linear search, Binary search
- Bubble sort, Selection sort, merge sort, Insertion sort, Quick sort

Unit IV Stack and Queue   **8 Hrs.**
- Introduction to stack.
- Stack representation and implementation

- Operations on stack, push, pop, peek
- Application of stack.
- Introduction to Queue
- Implementation of Queue using Array.
- Operations on Queue: Create, add, delete
- Introduction and implementation of Circular queue.
- Introduction to De-queue.

Unit V Linked List   **8 Hrs.**
- Introduction to Linked List.
- Representation and implementation of Singly Linked List.
- Traversing and searching of singly Linked List.
- Insertion and deletion in singly linked list.
- Types of linked list.

Unit VI Tree   **8 Hrs.**
- Introduction to tree, basic terminology used in Tree.
- Binary tree, properties of binary tree.
- Traversal of binary tree: pre, post and in-order
- Binary search tree.

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