Diploma (Computer Science)
Fourth Semester

Course Title: DATA STRUCTURE USING C

Course Code: EDA-403

Pre-requisites, if any: Basic knowledge of programming.

Course Description:

The purpose of this course is to provide basic concepts of data structures and algorithms. The main goal of the course is to teach the students how to select and design data structures for algorithms that are appropriate for problems that they might encounter. This course is also to learn abstracts data types, graphs, tree and its traversal, and different searching and sorting techniques. This also provides knowledge of Hashing techniques and Garbage Collection and Compaction.

Course Objective:

This course is designed to provide a better understanding of the theoretical and practical knowledge of data structure. Each student will enable themselves:

1. To impart the basic concepts of data structures and algorithms.
2. To understand concepts about searching and sorting techniques
3. To understand basic concepts about stacks, queues, lists, trees and graphs.
4. To enable them to write algorithms for solving problems with the help of fundamental data structures
5. Introduce students to data abstraction and fundamental data structures.

Course Outcomes (COs): After the completion of this course, students will be able to:-

CO1- Use and implement appropriate data structure for the required problems using a programming language such as C/C++.
CO2- Analyze step by step and develop algorithms to solve real world problems.
CO3- Implementing various data structures viz. Stacks, Queues, Linked Lists, Trees and Graphs.
CO4 - Understand various searching & sorting techniques.

Mapping COs with POs:

	PO 1	PO 2	PO 3	PO 4	PO5	PO6	PSO 1	PSO 2
CO 1	S	S			M		S	M
CO 2			S	M		M	M	M
CO 3	W		M			M	W	
CO 4		M		W				S

Course Content:

Unit-1

Introduction to Data Structure and its Characteristics Array: Introduction: Basic Terminology, Elementary Data Organization, Abstract Data Types (ADT), Representation of single and multidimensional arrays, Application of arrays, Array representations.

Unit-2

Stacks and Queues: Stacks: Abstract Data Type, Primitive Stack operations: Push & Pop, Array and Linked Implementation of Stack in C; Stack application; Infix, postfix, prefix expressions; Evaluation of

postfix expression; Operations on Queue: Create, Add, Delete, Full and Empty, Circular queues, Array and linked implementation of queues in C

Unit-3

Lists: Array Implementation and Pointer Implementation of Singly Linked Lists, Doubly Linked List, Circularly Linked List, Operations on a Linked List. Insertion, Deletion, Traversal.

Unit-4

Trees: Introduction and terminology; Binary Trees, Binary Tree Representation: Array Representation and Dynamic Representation, Complete Binary Tree; Traversal of binary trees; Binary Search Tree. Concept of Hashing & Collision resolution Techniques used in Hashing

TEXT BOOK(S):

1. RajeshK.Shukla,"DataStructureUsingCandC++"WileyDreamTechPublication.

REFERENCES:

1. A.K. Sharma, Data Structure Using C, Pearson Education India.

Assessment Scheme:

- Continuous Internal Evaluation (CIA) consisting of:
  - Class Attendance (C): 5Marks
  - Home Assignment (H): 5Marks
  - Sessional Examination (T): 20Marks
- End Semester Examination (ESE): 70Marks

Mapping Assessment Components to COs:

	CO 1	CO 2	CO 3	CO 4
C	S	M	S	M
H	S		M	
Sessional Exam (T)		S	M	W
ESE	S	M		S

Note:

- CIA can have more components depending on the nature of course.
- The guidelines for all assessment components are as per MUIT Guidelines & Rules (2.3-curriculum development).