

Course Code	Course Title	H	C	I	E	T
17U3DMC5	DATA STRUCTURES AND COMPUTER ALGORITHMS	5	5	25	75	100

Objectives:

- To impart the knowledge of computer programming with algorithmic approach.
- Learning the concept of data structures and its operations.

UNIT I : Stacks and Queues

(15 hours)

The Stack & Queue abstract data type– A Mazing Problem – Evaluation of Expressions– Multiple Stacks and Queues. **Linked Lists:** Singly Linked Lists –Circular list- Linked Stacks and Queues – Polynomials- Doubly Linked List.

UNIT II : Trees

(15 hours)

Basic Terminology – Binary Trees- Properties - Representations - Binary Tree Traversal – Additional Binary tree operations-Threaded Binary Trees.

UNIT III : Graphs

(15 hours)

Definitions and Representations – Elementary Graph operations-Minimum Cost Spanning Trees – Shortest Path and Transitive Closure – Activity Networks.

UNIT IV: Divide and Conquer

(15 hours)

The General Method – Binary Search – Finding the Maximum and Minimum – Merge Sort – Quick Sort – Selection Sort.

UNIT V: The Greedy Method

(15 hours)

The General Method – Knapsack problem-Tree vertex Splitting-job sequencing with deadlines- Minimum cost spanning trees-optimal storage on tapes-optimal merge patterns-single source shortest path.

Text Books:

1. Ellis Horowitz , Sartaj Sahni & Dinesh Mehta – “Fundamentals of Data structures in C++” - 2nd Edition - Universities Press 2007.
2. Ellis Horowitz , Sartaj Sahni & Sanguthevar Rajasekaran- “Fundamentals Of Computer Algorithms”- 2nd Edition- Universities Press 2007.

Reference Books:

1. Yedidyah langsam, Moshe J.Augenstein and Aaron- “Data structures using C “– PHI.
2. Seymour Lipschutz – “Data Structures” - TataMcGrawhill – Year 2006.
3. Jean Paul Tremblay and Paul G Sorenson – “An Introduction to Data structure with Application” - THM, II Edition – 1