

MC5104 DATA STRUCTURES

DETAILED SYLLABUS

OBJECTIVES:

- Be familiar with basic techniques of algorithm analysis.
- Be exposed to the concept of ADTs.
- Learn linear data structures-List, Stack and Queue.
- Learn nonlinear data structures-Tree and Graphs.
- Be exposed to sorting, searching and hashing algorithms

UNIT I INTRODUCTION

Introduction - Abstract Data Types (ADT) – Arrays and its representation – Structures – Fundamentals of algorithmic problem solving – Important problem types – Fundamentals of the analysis of algorithm – analysis frame work – Asymptotic notations, Properties, Recurrence Relation.

UNIT II LINEAR DATA STRUCTURES – LIST

List ADT - Array-based Implementation - Linked list implementation - Singly Linked Lists – Circularly linked lists – Doubly Linked Lists - Applications of linked list – Polynomial Addition.

UNIT III LINEAR DATA STRUCTURES - STACK, QUEUE

Stack ADT – Operations on Stack - Applications of stack – Infix to postfix conversion – evaluation of expression - Queue ADT – Operations on Queue - Circular Queue - Applications of Queue.

UNIT IV NON-LINEAR DATA STRUCTURES - TREES AND GRAPHS

Trees and its representation – left child right sibling data structures for general trees- Binary Tree – Binary tree traversals – Binary Search Tree - Graphs and its representation – Graph Traversals - Depth-first traversal – breadth-first traversal-Application of graphs.

UNIT V SORTING, SEARCHING AND HASH TECHNIQUES

Sorting algorithms: Insertion sort - Bubble sort - Quick sort - Merge sort - Searching: Linear search – Binary Search - Hashing: Hash Functions – Separate Chaining – Open Addressing – Rehashing.

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6. Reema Thareja, "Data Structures Using C", Oxford University Press, 2011.
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