Diploma, Anna Univ UG & PG Courses

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CS8391 DATA STRUCTURES

DETAILED SYLLABUS

OBJECTIVES:

- To understand the concepts of ADTs
- To Learn linear data structures – lists, stacks, and queues
- To understand sorting, searching and hashing algorithms
- To apply Tree and Graph structures

UNIT I LINEAR DATA STRUCTURES – LIST

Abstract Data Types (ADTs) – List ADT – array-based implementation – linked list implementation –– singly linked lists- circularly linked lists- doubly-linked lists – applications of lists –Polynomial Manipulation – All operations (Insertion, Deletion, Merge, Traversal).

UNIT II LINEAR DATA STRUCTURES – STACKS, QUEUES

Stack ADT – Operations - Applications - Evaluating arithmetic expressions- Conversion of Infix to postfix expression - Queue ADT – Operations - Circular Queue – Priority Queue - deQueue – applications of queues.

UNIT III NON-LINEAR DATA STRUCTURES – TREES

Tree ADT – tree traversals - Binary Tree ADT – expression trees – applications of trees – binary search tree ADT –Threaded Binary Trees- AVL Trees – B-Tree - B+ Tree - Heap – Applications of heap.

UNIT IV NON-LINEAR DATA STRUCTURES - GRAPHS

Definition – Representation of Graph – Types of graph - Breadth-first traversal - Depth-first traversal – Topological Sort – Bi-connectivity – Cut vertex – Euler circuits – Applications of graphs.

UNIT V SEARCHING, SORTING AND HASHING TECHNIQUES

Searching- Linear Search - Binary Search. Sorting - Bubble sort - Selection sort - Insertion sort – Shell sort – Radix sort. Hashing- Hash Functions – Separate Chaining – Open Addressing – Rehashing – Extendible Hashing.

TEXT BOOKS:

1. Mark Allen Weiss, "Data Structures and Algorithm Analysis in C", 2nd Edition, Pearson Education,1997.

2. Reema Thareja, "Data Structures Using C", Second Edition, Oxford University Press, 2011

REFERENCES:

1. Thomas H. Cormen, Charles E. Leiserson, Ronald L.Rivest, Clifford Stein, "Introduction to Algorithms", Second Edition, Mcgraw Hill, 2002.

2. Aho, Hopcroft and Ullman, "Data Structures and Algorithms", Pearson Education,1983.

3. Stephen G. Kochan, "Programming in C", 3rd edition, Pearson Education.

4. Ellis Horowitz, Sartaj Sahni, Susan Anderson-Freed, "Fundamentals of Data Structures in C", Second Edition, University Press, 2008