STANLEY
COLLEGE OF ENGINEERING & TECHNOLOGY FOR WOMEN
(Approved by AICTE , New Delhi | Affiliated to Osmania University ,Hyderabad)
Address : Chapel Road, Abids ,Hyderabad

BIT 204

DATA STRUCTURES

Course Objectives:

1. To develop proficiency in the specification, representation, and implementation of abstract data types and data structures.
2. To get a good understanding of applications of data structures.
3. To solve advanced computer science problems by making appropriate choice for intended applications.

UNIT-I

Algorithm Specification, Performance Analysis and Measurement.
Arrays: Abstract Data Types and the C++ Class, Array as an Abstract Data Type, Polynomial Abstract Data Type, Sparse Matrices, Representation of Arrays, String Abstract Data Type.

UNIT-II

Stacks and Queues: Templates in C++, Stack Abstract Data Type, Queue Abstract Data type, Sub typing and Inheritance in C++, A Mazing Problem, Evaluation of Expressions.

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UNIT-III

Linked Lists: Singly Linked Lists and Chains, Representing Chains in C++, Template Class Chain, Circular Lists, Available Space Lists, Linked Stacks and Queues, Polynomials, Doubly Linked Lists.
Hashing: Static Hashing, Hash Tables, Hash Functions, Overflow Handling, Theoretical Evaluation of Overflow Techniques

UNIT-IV

Trees: Introduction, Binary Trees, Binary Tree Traversal and Tree Iterators, Copying Binary Trees, Threaded Binary Trees, Heaps, Efficient Binary Search Trees: AVL Trees, m-way Search Trees, Introduction to Red Black tree & splay tree, B-tree.

Graphs: Graph Abstract Data Type, Elementary Graph operations (DFS and BFS), Minimum Cost Spanning Trees (Prim's and Kruskal's Algorithms).

UNIT-V

Sorting: Insertion sort, Quick sort, Best computing time for Sorting, Merge sort, Heap sort, shell sort, Sorting on Several Keys, List and Table Sorts, Summary of Internal Sorting.

Suggested Reading :

1. Ellis Horowitz, Dinesh Mehta, S. Sahani. Fundamentals of Data Structures in C++, Universities Press. 2007.
2. Mark Allen Weiss, Data Structures and Algorithm Analysis in C++, Pearson Education 2006.
3. Michael T. Goodrich, Roberto Tamassia, David Mount, Data Structures and Algorithms in C++, Wiley India Pvt. Ltd, 2004