Andhra Pradesh State Council of Higher Education
M.Sc. Computer Science Syllabus
MCS 101 - DATA STRUCTURES IN C

UNIT-I

Arrays and Structures: Arrays, Dynamically allocated arrays, Structures and Unions, polynomials.

Stacks and Queues: Stacks, Stacks using Dynamic Arrays, Queues, Circular queues using dynamic arrays, Evaluation of expressions, multiple stacks and queues.

Linked List: Single Linked List and chains, Representing chains in C, Linked stacks and queues, polynomials, Polynomial representation, Adding polynomials, Additional list operations, Operations on chains, Operations for Circularly linked lists, Sparse Matrices , Sparse Matrix representation, Doubly Linked lists.

UNIT – II

Introduction: Terminology, Representation of trees

Binary Trees: The abstract data type, Properties of binary trees, Binary tree representations.

Binary tree traversals: Inorder traversal, Preorder traversal, Postorder traversal

Threaded Binary trees: Threads Inorder traversal of a threaded binary tree

Binary Search Trees: Definition, Searching a BST,Insertion into a BST, Deletion from a BST.

UNIT-III

Sorting: Motivation, Insertion sort, Quick sort, Merge sort, Heap sort, External sorting.

Hashing: Introduction, Static hashing, Hash tables, hash functions, Overflow handling

UNIT- IV

Graphs: The graph abstract data type, Introduction, definitions, graph representations

Elementary graph operations: Depth First Search, Breadth First Search, Connected Components, Spanning trees, Biconnected Components.

Minimum cost Spanning trees: Kruskals Algorithm, Prims algorithm.

Shortest paths: Single source problem, All pairs Shortest path.

Prescribed Book:

Horowitz, Sahani, Anderson-Freed,"Fundamentals of Data Structures in C", Chapters 2-8

Reference Book:

1. D SAMANTA, "Classic Data Structures", –PHI
2. Balagurusamy, "C Programming and Data Structures", Third Edition, TMH(2008)