

Syllabus of Data Structure

Unit I

General concepts and linear data structures: Abstract data structures, properties and operations, Time and space analysis of algorithms, Big oh and theta notations and omega notations, Average, best and worst case analysis, Representation of Arrays -Single and Multi dimensional, Address calculation, Representation of Stacks and queues using arrays – Circular queues, Priority Queues, De-queue, Application of stacks, Multiple stacks

Unit II

Linked list: Linked Lists, Singly linked list, Implementation of linked list using static and dynamic memory allocation-dynamic memory allocation, circular linked list, doubly linked list, generalized list, operations on lists, linked stacks and queues

Unit III

Trees: General and binary trees, Representations and traversals, General trees as binary trees, Binary search trees, Applications, The concept of balancing and its advantages, B-Trees, B+ Trees, AVL Trees, Threaded Binary Trees.

Unit IV

Hashing: Hash functions, Collision resolution, Expected behavior, Applications

Unit V

Graphs and digraphs: Representations and traversals, Connectivity algorithms, shortest path, Minimal spanning tree, Unit VI: Sorting: Elementary sorts: selection, insertion, bubble sort, shell sort, Radix sort, Quick sort, merge sort, heap sort, Bucket sorting, External sorting, Worst case and average behaviour, Lower bound for sorting using comparisons

Text/Reference books:

1. Robert Kruse, Bruce Leung; Data structures and Program Design in C; Pearson Education, 2007.
2. Ellis Horowitz, Sartaj Sahni, Susan Anderson-Freed; Fundamentals of Data Structures in C; 2nd edition; Silicon Press; 2008.
3. Langsam, Augenstein and Tenenbaum; Data Structures using C and C++; PHI Publications; 1995.
4. D. Sanantha; Classic Data Structure; PHI Publications; 2004.