

**10 days**

**DSP**

100 Interesting Problem Solving

**absolutely FREE**

**12 days**

**DSV**

(Data Structure Visualization)  
**@500/-**

**45 days**

**DST**

(Data Structure for Technical...)  
**@1500/-**

**90 days**

**DS + ADA**

(Data Structure + Algorithm Analysis & Design)  
**@3400/-**

## DATA STRUCTURE VISUALIZATION

### 1 PREREQUISITE

- Recursion (Tower of Hanoi....)
- Order Notation (Polynomial....)
- String Matching
- Array (Sparse Matrix)
- Pointer

### 2 SORTING

- Bubble Sort
- Selection Sort
- Insertion Sort
- Counting Sort
- Merge Sort
- Quick Sort
- Heap Sort

### 3 LINEAR DATA STRUCTURE

- List
- Stack
- Deque

### 4 NON - LINEAR DATA STRUCTURE - 1 (TREE)

- Understanding Tree
- Different type of Tree
- Binary Tree
- Tree Traversal
- BST
- AVL Tree
- B-TREE

### 5 NON - LINEAR DATA STRUCTURE - 2 (GRAPH)

- Graph Representation
- BFS
- DFS
- Application of BFS & DFS
- Topological Sort
- MST
- Shortest Path

### 6 SEARCHING

- Finding Max & Min
- Sequential Search
- Binary Search
- Hashing
- Index Sequential Search
- Address Calculation Sorting
- Memory Management
- Discussion & Quiz

## DATA STRUCTURE USING 'C' and 'C++'

(As per Technical Universities Curriculum)

### 1 DEVELOPMENT OF ALGORITHMS:

- Algorithm and Analysis
- Notation (Big 'O' 'Omega' and 'Theta')
- Arrays and it's Operations, Storage structures for arrays
- Sparse matrices and it's Operations(Addition, Transpose and Multiplication)
- Structures and arrays of structures, Abstract Data Type (ADT)
- Stacks and Queues (Deque, Priority Queue and Circular Queue)

### 2 LINKED LISTS:

- Singly linked lists - Linked stacks and queues
- Polynomial Operation( Addition and Multiplication)
- Circularly Linked Lists.
- Doubly Linked Lists and Multi linked list
- Dynamic storage management (First-fit, Worst-fit and Best-fit)
- Garbage collection and compaction.

### 3 SEARCHING & SORTING TECHNIQUES:

- Linear searching - Binary Searching, Hash Table Methods and Address calculation
- Selection, Bubble, Insertion and Radix Sort
- Merge Sort
- Heap Sort
- Quick Sort

### 4 TREES :

- General Tree
- Binary Search Trees
- Tree Traversal (In-order, Pre-order, Post-order and level-order)
- Operations on Binary Trees
- Expression Manipulations and Symbol Table construction
- Height Balanced Trees. (AVL tree, Red Black Tree)
- B-tree and B<sup>+</sup> - Tree

### 5 GRAPHS :

- Representation of Graphs-(Adjacency list, Adjacency matrix and Path Matrix)
- BFS, DFS Traversal
- Connected component & Strongly connected component in Graph
- Bi-connected Graphs
- Topological sort, MST(Kruskal's and Prim's Algorithm)
- Shortest path problems (Dijkstra's Algorithm)
- Strings - Representation & Manipulations.
- Pattern Matching Operation (Boyer Moore & Knuth Morris Pratt)



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