



# A.D.COMPUTER TRAINING CENTER

An ISO 9001:2015 Certified Organization

Enrolled With Ministry of Micro, Small, and Medium Enterprises (MSME)

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## Data Structure Using C – Syllabus

### Module 1: Introduction to Data Structures

- Definition and classification.
- Abstract Data Types (ADT).
- Static and dynamic memory allocation.

### Module 2: Arrays and Linked Lists

- Arrays: definition, representation, operations.
- Single linked lists: creation, traversal, insertion, deletion.
- Circular linked lists and doubly linked lists.

### Module 3: Stacks and Queues

- Stack: definition, operations, applications (infix to postfix conversion, postfix expression evaluation).
- Queue: definition, operations, types (simple queue, circular queue, priority queue).

### Module 4: Trees

- Tree terminology.
- Binary trees, binary search trees (BST): creation, traversal (in-order, pre-order, post-order).
- AVL trees, B-trees & B+ Tree.

### Module 5: Graphs

- Graph terminology, representation (adjacency matrix, adjacency list).
- Traversal techniques: BFS (Breadth First Search), DFS (Depth First Search).
- Applications of graphs.

### Module 6: Searching and Sorting

- Searching: linear search, binary search.
- Sorting: bubble sort, insertion sort, selection sort, quick sort, merge sort.

### Module 7: Hashing and File Structures

- Hashing concepts, hash functions.
- Collision resolution techniques: chaining, open addressing.
- Basics of file structures.

**Laboratory / Practical:**

- Implementation of linked lists, stacks, and queues.
- Tree and graph implementations.
- Sorting and searching algorithms.
- File operations in C.

