DATA STRUCTURES SYLLABUS

Algorithm Analysis (VERY IMPORTANT 🔥)

- Time Complexity
- Space Complexity
- Best, Average & Worst Case
- Asymptotic Notations
  - Big-O
  - Big-Ω
  - Big-Θ

Arrays

- One-Dimensional Arrays
- Multi-Dimensional Arrays
- Array Operations
  - Traversal
  - Insertion
  - Deletion
  - Searching
- Advantages & Limitations

DATA STRUCTURES SYLLABUS

Strings

- String Representation
- String Operations
- Pattern Matching
- String Algorithms (basic idea)

Linked List (CORE TOPIC 🔥)

- Singly Linked List
- Doubly Linked List
- Circular Linked List
- Operations
  - Insertion
  - Deletion
  - Traversal
- Advantages over Arrays

DATA STRUCTURES SYLLABUS

Stack

- Stack Concept (LIFO)
- Stack Implementation
  - Using Array
  - Using Linked List
- Applications
  - Expression Evaluation
  - Recursion
  - Parenthesis Checking

Queue

- Queue Concept (FIFO)
- Types of Queue
  - Simple Queue
  - Circular Queue
  - Priority Queue
  - Deque
- Queue Implementation

DATA STRUCTURES SYLLABUS

Trees (VERY IMPORTANT 🔥)

- Tree Terminologies
- Binary Tree
- Binary Search Tree (BST)
- Tree Traversals
  - Inorder
  - Preorder
  - Postorder
- Height & Depth

Advanced Trees

- AVL Tree
- Heap
  - Min Heap
  - Max Heap
- Applications of Heap

DATA STRUCTURES SYLLABUS

Graphs

- Graph Terminology
- Types of Graphs
  - Directed
  - Undirected
  - Weighted
- Graph Representation
  - Adjacency Matrix
  - Adjacency List
- Graph Traversals
  - BFS
  - DFS

Searching Algorithms

- Linear Search
- Binary Search

DATA STRUCTURES SYLLABUS

Hashing

- Hash Function
- Hash Table
- Collision Handling
  - Chaining
  - Open Addressing

Dynamic Programming (INTRO)

- Concept of DP
- Memoization
- Tabulation
- Basic DP Problems

Greedy Algorithms

- Greedy Strategy
- Applications
- Comparison with DP