

DETAILED SYLLABUS

Week	Content
Week 1	<p>Introduction: Measuring Running time of Algorithms, Asymptotic Analysis, Big O Notation, Finding Big O, Tight and Loose Upper Bounds, Introduction Quiz A, Big O analysis of Algorithms, Finding Time Complexity, Big O analysis of Algorithms: Examples, Big O, Omega, Theta Notations with Graphs, Worst case, Best case and Average Case Analysis, Common Complexities, Abstract Data Types, Interview Questions from Introduction of DSA, GATE and Other Competitive Exam Questions</p> <p>Linked Lists: Introduction to Linked List, Traversing and Searching a Single Linked List, Finding references in a single linked list, Difference between while p is not None: and while p.link is not None, Insertion in a Single Linked List, Deletion in a Single Linked List, Reversing a Single Linked List, Linked List Quiz A,</p>
Week 2	<p>Linked Lists: Sorting a Linked list using Bubble Sort, Merging of sorted Linked lists, Sorting a Linked list using Merge Sort, Finding and Removing a cycle in a Linked list, Doubly linked list, Insertion in a doubly linked List, Deletion from doubly linked list, Reversing a doubly linked list, Circular linked list, Insertion in a circular Linked List, Deletion in a circular linked list, Concatenation, Linked List with Header Node, Sorted linked list, Interview Questions from Linked List, GATE and Other Competitive Exam Questions</p>
Week 3	<p>Stacks and Queues: Introduction to Stack data structure, Array Implementation of Stack, Linked List Implementation of Stack, Introduction to Queue Data Structure, Array Implementation of Queue, Circular Queue, Linked List implementation of Queue, Queue through Circular Linked List, Deque, Priority Queue, Checking validity of an expression containing nested parentheses, Evaluating Arithmetic Expressions, Polish Notations, Converting infix expression to postfix expression, Evaluation of postfix expression, Stack and Queue Quiz, Interview Questions from Stacks and Queues, GATE and Other Competitive Exam Questions</p>
Week 4	<p>Binary Trees: Introduction to trees, Binary Tree, Strictly Binary Tree and Extended Binary Tree, Full binary tree and Complete Binary Tree, Array Representation of Binary trees, Linked Representation of Binary Trees, Binary Tree Quiz A, Binary Tree in Python, Traversal in Binary Tree, Preorder Traversal, Inorder Traversal, Postorder Traversal, Level order traversal, Finding height of a Binary tree, Constructing Binary tree from Traversals,</p>

	Constructing binary tree from inorder and preorder traversals, Constructing binary tree from inorder and postorder traversals, Binary Tree Quiz B, Interview Questions from Binary Trees, GATE and Other Competitive Exam Questions
Week 5	<p>Binary Search Trees: Introduction, Traversal in Binary Search Tree, Searching in a Binary Search Tree, Nodes with Minimum and Maximum key, Insertion in a Binary Search Tree, Deletion in a Binary Search Tree, Binary Search Tree Quiz, Interview Questions from Binary Search Trees, GATE and Other Competitive Exam Questions</p> <p>Heap: Introduction, Heap Representation, Insertion in Heap, Deletion, Building a Heap, Heap Applications, Heap Quiz, Interview Questions from Heap, GATE and Other Competitive Exam Questions</p> <p>Graphs: Introduction, Graph Representation, BFS vs DFS</p>
Week 6	<p>Sorting: Introduction to Sorting Algorithms, Sort Stability, Selection Sort, Selection Sort : Example, Selection Sort in Python, Analysis of Selection Sort, Bubble Sort, Bubble Sort : Example, Bubble Sort in Python, Improvement in Bubble Sort, Analysis of Bubble Sort, Sorting Quiz A, Insertion Sort, Insertion Sort : Example, Insertion Sort in Python, Analysis of Insertion sort, Shell Sort, Shell Sort : Example, Shell Sort in Python, Analysis of Shell Sort, Merging, Recursive Merge Sort, Recursive Merge Sort in Python, Analysis of Merge Sort, Iterative Merge Sort, Iterative Merge Sort in Python, Quick Sort, Quick Sort in Python, Analysis of Quick Sort, Binary tree sort, Binary Tree Sort in Python, Analysis of Binary Tree Sort, Heap Sort, Heap Sort : Python, Implementation and Analysis, Radix Sort, Radix Sort : Implementation and Analysis, Sorting Quiz B, Comparison chart (Time Complexities and Auxiliary Space), Interview Questions from Heap, GATE and Other Competitive Exam Questions</p> <p>Searching: Linear Search, Linear Search in Sorted List, Binary Search, Implementation of Binary Search, Analysis of Binary Search, Interview Questions from Heap, GATE and Other Competitive Exam Questions</p>
Week 7 (O)	<p>Hashing : Direct Addressing, Hashing, Collisions, Hash Functions, Open Addressing : Linear Probing, Open Addressing : Quadratic Probing, Open Addressing : Double Hashing, Deletion in Open Addressed Tables, Implementation of Open Addressing, Separate Chaining, Implementation of Separate Chaining, Interview Questions from Heap, GATE and Other Competitive Exam Questions</p> <p>Project Related to the concepts of DSA: Hint and Suggestions, Self Work By Students, Queries and Discussion, Conclusion and Future Guidance Project: Flight Reservation System</p>

	Description: Develop a system for managing flight reservations, seat allocations, and booking cancellations for an airline company. Utilize data structures such as queues, trees (for seat mapping), and hash tables (for passenger information) to handle flight operations smoothly. Implement algorithms for seat assignment, waitlist management, and optimizing flight schedules.
Week 8 (O)	

***** Our Trainer is Mr. Rahul Jain who have cleared GATE 6 times and is gold medalist**

