

Department of Computer Science & Engineering

Subject Name: Data Structure

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Faculty Members: Moumita Samanta(MS),Susmita Biswas(SB),Mrinal Maity(MM),Santunu Saha(SS),Antara Ghosh(AG)

UNIT	HOURS	TOPICS	COURSE CONTENT
1	3	Fundamentals of Computer	1.1 Data Representation 1.2 Abstract data Types 1.3 Data Structure and Structured Types 1.4 Atomic Type 1.5 Difference between Abstract Data Types, Data Types And Data Structures 1.6 Data Types 1.7 Linear data type 1.8 Non- Linear data type 1.9 Primitive data type 1.10 Non primitive data type 1.11 Refinement Stages
2	2	Principles of programming and Analysis of Algorithms:	2.1 Algorithms 2.2 Different approaches for designing an algorithm 2.3 Complexity 2.4 Big 'O' Notation 2.5 Algorithm analysis
3	4	Stacks	3.1 Introduction to Stacks 3.2 Stacks as an Abstract Data Type 3.3 Primitive operations of stacks 3.3 Representation of Stacks through Arrays 3.4 Representation of Stacks through Linked List 3.5 Application of Stacks 2.6 Stack and Recursion
4	4	Queues	4.1 Introduction 4.2 Queue as an Abstract Data Type 4.3 Representation of Queues 4.4 Operations on queue: Searching, Insertion, Deletion. 4.5 Circular Queues 4.6 Priority Queue 4.7 Application of Queues
5	8	Linked List	5.1 Introduction, 5.2 Terminologies Node, Address, Pointer, Information, Next, Null pointer, Empty list etc. 5.3 Operations on list Searching, Insertion and Deletion 5.4 Types of lists Linked list and Circular list 5.5 Reverse and Merging Linked list 5.6 Array stacks, queues, implementation using list.
6	8	Trees	6.1 Introduction to Binary Trees 6.2 Types of Trees 6.3 Basic Definition of Binary Trees 6.4 Operations on Binary Search Tree 6.5 Type of tree Binary, Height balanced and Weight

			<p>balanced tree</p> <p>6.6 Operations on trees,</p> <p>6.7 Searching Depth-first search and Breadth-first search</p> <p>6.8 Traversing Pre-order, In-order and Post-order</p> <p>6.9 Insertion,</p> <p>6.10 Deletion,</p>
7	6	Graphs	<p>7.1 Introduction to Graphs</p> <p>7.2 Terms Associated with Graphs</p> <p>6.3 Terminology graph, node (vertices), arcs (edge), directed graph, in-degree, out-degree, adjacent, successor, predecessor, relation, Weight, path, length</p> <p>7.4 Sequential Representation of Graphs</p> <p>7.5 Linked Representation of Graphs</p> <p>7.6 Traversal of Graphs</p> <p>7.7 Spanning Trees</p> <p>7.8 Shortest Path</p> <p>7.9 Application of Graph</p>
8		Searching & Sorting	<p>8.1 Sorting-An Introduction</p> <p>8.2 Efficiency of Sorting Algorithms</p> <p>8.3 Bubble Sort</p> <p>8.4 Selection Sort</p> <p>8.5 Quick Sort</p> <p>8.6 Insertion Sort</p> <p>8.7 Merge Sort</p> <p>8.8 Binary Tree Sort</p> <p>8.9 Radix Sort</p> <p>8.10 Shell Sort</p> <p>8.11 Heap Sort</p> <p>8.12 Searching-An Introduction, Binary Search</p>
9	2	Hashing	<p>9.1 Hash functions</p> <p>9.2 Deleting items from hash tables</p>