

**5 years Integrated M.Sc. (IT) – Semester 3
Teaching Schedule
060010308 – Data Structures**

Unit	Unit Name	Sub Unit	Topics	No. of Lectures	Reference Chapter/Additional Reading	Teaching Methodology
1	Introduction to Data Structures and Algorithm	1.1	Definition, Structure and properties of algorithms	1	[GA#] - chapter 1: Pages 3 to 4	Presentation
		1.2	Data Structure and Algorithms	1	[GA#]- chapter 1: Pages 4 to 6	Presentation
		1.3	Analysis of Algorithms	4	[GA#]- chapter 2: Pages 8 to 14 [GF#]- chapter 1: Pages 27 to 35	Presentation
2	Arrays, Stack and Queue	2.1	Arrays: Operations in Array, Memory representation and Applications of Array	3	[DS#]- chapter 2: Pages 12	Demonstration Chalk and Talk
		2.2	Stack and its operations	2	[DS#]- chapter 4: Pages 105	Demonstration Chalk and Talk
		2.3	Queue and its operations	3	[DS#]- chapter 5: Pages 153 to 160	Demonstration Chalk and Talk
		2.4	Types of Queue	2	[DS#]- chapter 5: Pages 160	Chalk and Talk
		2.5	Applications of Stack	1	[DS#]- chapter 5: Pages 111	Chalk and Talk
		2.6	Applications of Queue	1	[DS#]- chapter 5: Pages 172	Chalk and Talk
3.	Linked List	3.1	Singly Linked List	2	[DS#]- chapter 3: Pages 37	Chalk and Talk & Demonstration

		3.2	Doubly Linked List	2	[DS#]- chapter 3: Pages 54	Chalk and Talk & Demonstration
		3.3	Circularly Linked List	1	[DS#]- chapter 3: Pages 54	Chalk and Talk & Demonstration
		3.4	Applications	1	[DS#]- chapter 3: Pages 63	Chalk and Talk & Demonstration
		3.5	Linked Stack and Linked Queue	1	[DS#]- chapter 4: Pages 107 [DS#]- chapter 5: Pages 159	Chalk and Talk
4.	Trees	4.1	Basic Terminologies	1	[DS#]- chapter 7: Pages 214	Chalk and Talk & Demonstration
		4.2	Representation of Binary Tree	2	[DS#]- chapter 7: Pages 222	Chalk and Talk & Demonstration
		4.3	Operations on Binary Tree	2	[DS#]- chapter 7: Pages 230	Chalk and Talk & Demonstration
		4.4	Types of Binary Tree	1	[DS#]- chapter 7: Page 249	Presentation
		4.5	Introduction to B Trees, B+ Trees and Trie Tree	2	[DS#]- chapter 7: Pages 375 [DS#]- chapter 7: Pages 401- 403	Chalk and Talk & Demonstration
		4.6	Applications of Tree	1	[GA#] – chapter 8: Pages 169	Chalk and Talk
5.	Sorting	5.1	Elementary Sorting Algorithm : Bubble Sort, Insertion Sort and Selection Sort	3	[GA#]- chapter 16 : Pages 394 to 400	Chalk and Talk
		5.2	Efficient Sorting Algorithm : Shell Sort, Quick Sort, Merge Sort, Radix Sort, Heap Sort, Counting Sort	4	[GA#]- chapter 16 : Pages 401 to 425	Chalk and Talk

6.	Searching	6.1	Types of Searching Technique and Needs of Searching	1	[DS#]- chapter 11 : Pages 712	Chalk and Talk
		6.2	Linear Search: Array, Linked List, Ordered List and Binary Search	3	[DS#]- chapter 11 : Pages 714 [DS#]- chapter 11 : Pages 719 [DS#]- chapter 11 : Pages 720 [DS#] – chapter 11 : Pages 722	Chalk and Talk
		6.3	Non-linear Search: Binary Tree Searching and Binary Search Tree Searching	3	[DS#]- chapter 11 : Pages 738 [DS#]- chapter 11 : Pages 739 [DS#]- chapter 11 : Pages 743	Chalk and Talk

Text Book:

1. DebasisSamanta. Classic Data Structures, PHI.[DS#]

Reference Book:

1. PAI G A V., Data Structures and Algorithms-Concepts, Techniques and Applications, McGraw Hill [GA#]
2. Gilberg, R., Forouzan, B., Data Structures-A Pseudocode Approach with C++, Thomson[GF#]
3. Joshi, B., Data Structures and Algorithms using C++, Tata McGraw Hill.
4. Berman, A., Data Structures via C++-Objects by Evolution, Oxford.
5. Weiss, M., Data Structures and Algorithms using C++ , Pearson
6. Sahani, S., Data Structures, Algorithms and Applications in Java, Universities