

**GAUHATI UNIVERSITY
GUWAHATI**

LESSON PLAN

Subject : Advanced Data Structure
Subject Code : CS/IT 2056
Semester : 2nd
Department : Computer Science
Lecturer : Dr. Sanjib Kr Kalita

L-T-P-C=4-0-2-6

Theory = 100 marks.

MODUL E. NO.	TOPIC	COURSE CONTENT	NO. OF SLOTS	REMARKS
1	Review of basic concepts in Data Structure	A quick review of array versus linked list structure	2	Assignment-1 Class Test -1 Quiz 1
		binary tree	1	
		binary search tree; traversal, insertion and deletion in binary search trees	2	
		Total slots		
2	Dictionary ADT	Search trees, balancing of search trees – AVL trees	1	
		Red-Black trees	1	
		multi way search trees	1	
		2-3 trees, splay trees	1	
		Insertion and Deletion in each of the above data structures	1	
		Hashing	1	
		Total slots		6
3	Sorting and Selection Techniques	Quick sort	1	Assignment 2 Class Test 2
		Heap sort	1	
		Shell sort	1	
		Counting sort, Radix sort	1	
		Medians and order Statistics	1	
		Selection and Adversary arguments	1	
		Lower bound on sorting	1	
		Total slots		
4	Priority Queue ADT	Heaps-extended priority queue, min(max) heaps	1	
		binomial heap	2	

		Fibonacci heap and its amortized analysis.	2		
Total slots			5		
5	Partition ADT	Union-find algorithms through weighted merge	2	Assignment 3	
		path compression	1		
Total slots			3		
6	Data Structure for external storage operations	Introduction,	1		Class Test 3
		B-tree	1		
		insertion and deletion in B-trees	1		
		B ⁺ tree	1		
		external sorting	1		Quiz 2
Total slots			5		

Assignments and Class test:

Students are to submit at least three assignments and to appear three class tests.

TEXT BOOKS/REFERENCES :

- T. H. Cormen, C. E. Leiserson and R. L. Rivest, Introduction to Algorithms, Tata-Mcgraw Hill Publishers.
- A. Aho, J. E. Hopcroft and J. D. Ullman, Data Structures and Algorithms, Addison-Wesley.
- Horowitz and Sahani, Fundamentals of Data Structures in C/C++, Computer Science Press.
- A. Aho, J. E. Hopcroft and J. D. Ullman, Design and Analysis of Computer Algorithms, Addison-Wesley.

VIDEO RESOURCES

- NPTEL, IIT Madras
- NPTEL, IIT Delhi

Signature