SREE VIDYANIKETHAN ENGINEERING COLLEGE (Autonomous)

SREE SAINATH NAGAR, A. RANGAMPET – 517 102

LESSON PLAN

Name of the Subject   : Data Structures and Algorithms (16MT12502)

Class & Semester   : M. Tech, I - Semester

Name(s) of the faculty Member(s)   : V. Lokanadham Naidu

S. No.	Topic	No. of periods	Book(s) followed	Topics for self study
UNIT – I: Introduction to Data Structures and Algorithms				
1.	Review of Data Structures – Stack, Queue	1	T1	Evaluation of Infix, Postfix and Prefix expressions.
2.	Circular Queue, Single Linked List	1	T1	
3.	Double Linked List	1	T1	
4.	Circular Linked List, Applications	1	T1	
5.	Efficiency of algorithms, Apriori Analysis	1	T1	
6.	Asymptotic Notations	1	T1	
7.	Polynomial vs Exponential Algorithms	1	T1	
8.	Average, Best and Worst Case Complexities	1	T1	
9.	Analyzing Recursive Algorithms.	2	T1	
	Total periods required:	**10**		
	UNIT – II: Searching, Sorting and Trees & Graphs			
10.	Linear Search, Fibonacci Search	1	T1	Disjoint Sets
11.10	Counting Sort, Bucket Sort	1	R1	
12.	Radix Sort, Introduction to trees	1	T1	
13.	representation of trees, binary trees,	2	T1	
14.	binary tree traversal techniques, Introduction to graphs	1	T1	
15.14	representation of graphs, graph traversal techniques	1	T1	
16.	Applications of Trees and Graphs	2	T1	
	Total periods required:	**09**		
	UNIT -III: Binary Search Trees, AVL Trees, B- Trees and Hash Tables			
17.	BST Definition, Operations, Applications	2	T1	M-Trees
18.	Introduction to AVL Trees	1	T1	
19.	Operations, Applications	2	T1	
20.	Heap Definition, Heap Implementation, Applications	2	T1	
21.	Hash Tables - Definition, Hash Functions	2	T1	
22.	Applications	1	T1	
	Total periods required:	**10**		

S. No.	Topic	No. of periods	Book(s) followed	Topics for self study
	UNIT – IV: Divide and Conquer & Greedy Methods			
23.	General Method of Divide and Conquer	1	T2	Optimal Binary Search Tree
24.	Binary Search, Finding Maximum and Minimum	1	T2	
25.	Quick Sort	1	T2	
26.	Merge sort	1	T2	
27.	Strassen's Matrix Multiplication	1	T2	
28.	General Method of Greedy	1	T2	
29.	Job sequencing with deadlines	1	T2	
30.	Minimum Cost Spanning Tree	2	T2	
31.	Single Source Shortest Path	1	T2	
	Total periods required:	**10**		
	UNIT – V: Dynamic Programming, Back Tracking & Branch and Bound			
32.	General Method of dynamic programming	1	T2	Travelling Salespersons Problem using Branch and Bound
33.	All Pairs Shortest Path	1	T2	
34.	0/1 Knapsack problem	1	T2	
35.	Traveling Salesperson Problem	1	T2	
36.	General Method of backtracking	1	T2	
37.	8 – Queen's Problem	2	T2	
38.	Graph Coloring	1	T2	
39.	General Method of Branch and Bound, LC Search	1	T2	
40.	LIFO and FIFO branch and bound solutions of 0/1 Knapsack Problem	2	T2	
Total periods required:		**11**		
Grand total periods required:		**50**		

TEXT BOOKS:

T1. G. A. V. Pai, *"Data Structures and Algorithms: Concepts, Techniques and Applications,"* 1st Edition, Tata McGraw Hill, 2008.

T2. Ellis Horowitz, Sartaj Sahni, Sanguthevar Rajasekaran, "*Fundamentals of Computer Algorithms,"* 2nd Edition, Universities Press (India) Pvt. Ltd, 2008.

REFERENCE BOOKS:

R1. Richard Gileberg, Behrouz A. Forouzan*, "Data Structures: A Pseudocode Approach with C,"* Second Edition, 2007.

R2. Mark Allen Weiss, *"Data Structures and Algorithm Analysis in C++,"* 3rd Edition, Pearson Education, 2007.

R3. Sartaj Sahni, *"Data structures, Algorithms and Applications in C++,"* 2nd Edition, Universities press (India) Pvt. Ltd., 2005.