Lesson plan

Name if the faculty : Dr. Gurbrinder Kaur

Discipline : Computer Science Engineering

Semester : 3rd

Subject : Data Structures Using C

Lesson Plan Duration : 15 weeks (From August, 2019 to November 2019)

Work Load (Lecture/ Practical) per week (in hours): Lecture-03, Practical-02

Week	Theory		Practical	
	Lecture day	Topic(Including assignment/test)	Practical Day	Topic
1st	1st	**Introduction:** Basic Terminologies: Concept of Data Structure,	1st	Write a program to search an element in the array using Linear Search.
	2nd	Choice of right Data Structure, Algorithms,		
	3rd	How to design and develop algorithm		
2nd	1st	Complexity of algorithms	2nd	1. Write a program to search an element in an array using binary search algorithm. 2. Write a program to show all operation in an array.
	2nd	**Operations:** • Insertion • Deletion • Traversal		
	3rd	Linear Search		
3rd	1st	Binary Search	3rd	Write a Program to order alphabets of a word in Lexical order.
	2nd	Techniques and their complexity analysis.		
	3rd	Revision of Unit I		

4th	1st	**Stacks and Queues**: Stack and its operations, Algorithms and their complexity analysis,	4th	1. WAP Program to create Stack & perform its operations 2. Write a program to implement Stacks using arrays
	2nd	Applications of stacks, Expression Conversion and evaluation		
	3rd	corresponding algorithms and complexity analysis		
5th	1st	**Queues:** Types of Queue: Simple Queue,	5th	1. WAP to program to make a queque and perform all operations : 1. Insertion 2. Deletion 3. Traversing
	2nd	Circular Queue ,Priority Queue		
	3rd	Operations on each types of Queues: Algorithms and their analysis.		
6th	1st	**Linked Lists:** Singly linked lists, Representation in memory	6th	Write a Program to create a Linked List & perform the following operations: a. Insert an element in the beginning b. Insert an element at the end c. Insert an element in between d. To delete a node e. Display the nodes f. Count elements
	2nd	Linked List Operations: Insertion Deletion		
	3rd	Linked List Operations Traversing Searching		
7th	1st	**Linked Lists**: Representation of Stack and Queue	7th	Convert the singly list to doubly linked list and perform all operations
	2nd	Doubly Linked List		
	3rd	Circular Linked List		
8th	1st	**Trees**: Introduction to trees	8th	Create a binary tree and implement the tree traversal techniques of inorder, preorder and post order.
	2nd	Binary trees		
	3rd	Representation and traversal of trees		
9th	1st	Types of binary trees	9th	WAP to implement Binary Tree using Linked List.
	2nd	Threaded binary trees, B Trees		
	3rd	B+ Tree, Application of trees		
10th	1st	AVL Trees	10th	WAP to Construct a Balanced Binary Tree (AVL Tree) for user input
	2nd	Sorting and Hashing		
	3rd	Selection Sort		
11th	1st	Bubble Sort	11th	Write a Menu driven program to sort an array using the following algorithm a. Selection Sort b. Merge Sort c. Insertion Sort
	2nd	Insertion Sort		
	3rd	Quick Sort		

				d. Bubble Sort e. Quick Sort
12th	1st	Merge Sort	12th	WAP to Count Number of Leaf Nodes in a Tree
	2nd	Heap Sort		
	3rd	Performance and Comparison among all the methods		

13th	1st	**Graphs:** Introduction	13th	WAP to Find the Shortest Path Between Two Vertices Using Dijkstra's Algorithm.
	2nd	terminology, matrix' representation		
	3rd	operations on graphs		
14th	1st	Applications of graphs	14th	Revision Questions
	2nd	Revision		
	3rd	Revision		