SCHEME OF COURSE WORK

Department of Information Technology

Course Details:

Course Title	***Advanced Data Structures Lab***
Course Code	**: *13IT2109***
Program:	**: M.TECH**
Specialization:	**Software Engineering**
Semester	**: I**
Prerequisites	**: Computer Programming through C, Data Structures, Design and Analysis of Algorithms**
Courses to which it is a prerequisite: Computer Networks. Data Mining, Data Base Management Systems.	

Course Outcomes (COs):

CO No.	Course outcomes
CO1	Implement List ADT's and their operations.
CO2	Develop programs for sorting.
CO3	Develop programs for implementing trees and their traversal.
CO4	Implement graph traversal algorithms.
CO5	Apply algorithm design techniques.

Course Outcome versus **Program Outcomes:**

Course outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	S	S	S	S	M	M	M				S
CO2	S	S	S	S	M	M	M				
CO3	S	S	S	S	M	M	M				
CO4	S	S	S	S	M	M					
CO5	S	S	S	S	M	M	M				

Assessment Methods: Viva voce / Mid-Test /	

Teaching-Learning and Evaluation

Week	EXPERIMENT	Course Outcomes	TEACHING-LEARNING STRATEGY	Assessment Method & Schedule
1	Write a program to perform the following operations on singly linked list. i)Creation ii) Insertion iii) Deletion iv) Traversal. .	CO-1	▫ Lecture / Discussion ▫ Problem solving	Mid-Test 1 (Week 9)
2	Write a program to perform the following operations on doubly linked list. i)Creation ii) Insertion iii) Deletion iv) Traversal in both ways	CO-1	▫ Lecture / Discussion ▫ Problem solving	Mid-Test 1 (Week 9)
3	Write a program that implements stack (its operations) using i) Arrays ii) linked list	CO-1	▫ Lecture ▫ Problem solving	Mid-Test 1 (Week 9)
4	Write a programs that implements Queue (its operations) using i) Arrays ii) linked list .	CO-1	▫ Lecture / Discussion ▫ Problem solving	Mid-Test 1
5	Write C program that implements the Quick sort method to sort a given list of integers in ascending order.	CO-2	▫ Lecture / Discussion ▫ Problem solving	(Week 9)
6	Write C program that implement the Merge sort method to sort a given list of integers in ascending order	CO-2	▫ Lecture / Discussion ▫ Problem solving	Mid-Test 1 (Week 9)
7	Write C program that implement the SHELL sort method to sort a given list of integers in ascending order.	CO-2	▫ Lecture / Discussion ▫ Problem solving	Mid-Test 1 (Week 9) Assignment (Week 7-8)
8	Write a program to perform the following: i) Creating a Binary Tree of integers	CO-3	▫ Lecture / Discussion ▫ Problem solving	Mid-Test 1 (Week 9)

	ii) Traversing the above binary tree in preorder, inorder and postorder.			
9	Write a C program to perform the following: i)Creating a AVL Tree of integers ii)Traversing the above binary tree in preorder, inorder and postorder.	Co-3	▫ Lecture / Discussion blem solving	Mid-Test 2 (Week 18)
10	Write a C program that uses functions to perform the following: i)Creating a SplayTree of integers ii)Traversing the above binary tree in preorder, inorder and postorder.	Co-3	▫ Lecture / Discussion ▫ Problem solving	Mid-Test 2 (Week 18)
11	Write a program that implements Kruskals algorithm using a disjoint set data structure. The program takes as input a file (data.txt), in which each 4line either represents a vertex or an edge. For the edge lines, the first integer on that line representing the starting vertex, the second the ending vertex, and the third the weight of the edge. Use this file to construct, line by line, the graph upon which Kruskal's algorithm will be run (do NOT hardcode this graph!).	CO-4	▫ Lecture / Discussion ▫ Problem solving	Mid-Test 2 (Week 18)
12	Write a program to simulate various graph traversing algorithms.	CO-4	▫ Lecture / Discussion ▫ Problem solving	Mid-Test 2 (Week 18)
13	Write a program to simulate various graph traversing algorithms.	CO-4	▫ Lecture / Discussion ▫ Problem solving	Mid-Test 2 (Week 18)
14	Write a program to find the minimal spanning tree of a graph using the Prim's algorithm. The program should be able to read in the weight matrix of a graph and produce the minimal spanning tree Generate weight matrices (using a random number generator)	CO-4	▫ Lecture / Discussion ▫ Problem solving	Mid-Test 2 (Week 18)
15	Write a program to find the closest pair of points using a divide and	CO-5	▫ Lecture / Discussion ▫ Problem solving	Mid-Test 2 (Week 18)

	conquer strategy. Use the random number generator to generate a large number of points in a unit square as input to the algorithm.			
16	Use dynamic programming to find the optimal binary search tree for a given set of numbers together with their probabilities. Remember that the numbers may be generated in any order, so, a presorting step is also required	CO-5	▫ Lecture / Discussion ▫ Problem solving	Mid-Test 2 (Week 18)
18	**Mid-Test 2**			
19/20	**END EXAM**			