CA-701 - DATA STRUCTURES LAB USING C			
Date	**Lab Experiments**	**Topic**	**Problem statement**
29-9-2021	1	Array and its various operations with example	Given a seat matrix where column represents branches, row represents colleges and the cell data hold number of seats vacant, create a function that allocate seats for n students based on their preferences. User preferences should be in string. Give provision to convert it into numerical index before allocating seat. Give appropriate error message if there is no vacancy.
6- 10-2021	2	Evaluate the arithmetic expression using stack	Given an Arithmetic expression involving at least 5 variables. Write a program to generate postfix notation for the expression and evaluate it for various user inputs using appropriate data structure. First, solve unparenthesized expressions and then parenthesized expressions.
13- 10-2021	3	Stack and its various applications	Given a metadata of video lectures (Video ID, Subject, Topic, Duration, Date Created, URL) and the course syllabus given as a sequence of phrases separated by hyphen (-) in a text file. Create a sequence of video metadata so that it can be played continuously according to the syllabus. Write a C code using suitable data structures. Ensure that video metadata sequence is accessed only in forward sequence.
20- 10-2021	4	Linked list and its types	Given a sequence of characters typed on a word file. Write a program to perform undo and redo operation on the characters using appropriate data structures.
27-10-2021	5	Trees and its various operations	Given a set of rules used to sanction loan for a customer in a bank in the form of attribute no., attribute, condition, true value, false value (ex>101, Age, Young, Salary, Experience), represent them as a decision tree. For a given details of a customer, display your decision regarding a sanctioning of loan based on decision tree.
03-11-2021	6	Tree traversals with example	Construct a tree that represents an HTML file where each node represents the tag name such as <HTML>, <Head>, <Body> etc. at appropriate levels. Provide options to display the contents by following all the three traversals.
10-11-2021	7	Searching operations	Assume an application requires list of User ID, Password need to be stored and accessed randomly. Use appropriate data structure to store and retrieve them. Check for the strength of the password before storing and display its strength like weak, medium, strong and very strong.
17- 11-2021	8	Sorting Techniques	Define any sorting algorithm to sort any data. Create a phone book and sort the phone book based on different fields such as phone no, name, email id etc. using sorting algorithm.

24- 11-2021	9	Insertions and deletion in binary search tree (BST)	Create a phone book with options to search for names in phonebook using Tree data structure. Implement the same using Trie data structure and observe the efficiency.
1-12-2021	10	Traverse a graph using BFS & DFS techniques	Given a set of FB account details as name, education, friends list and posts, link all the FB accounts based on friends list using appropriate data structure. Create an application that performs following activities (i) List friends of a given account and print number of friends (ii) DFS/BFS (iii) Assign edge weights based on likes.
8-12-2021	11	B+ Trees	Create a structure that represents the details of Indian Citizen including Aadhaar number. Construct a B+ tree to store and access the data based on Aadhaar number.

Marks Evaluation

S.No.	Mode of Assessment	Week/Date	Duration	% Weightage
1	Lab Exercise	Every week	3 hrs	30
2	Lab Observation	Every week	3 hrs	10
3	Lab Experiment- viva	Every week	3hrs	10
4	Model Assesment	10th week	1 ½ hrs	20
5	Compensative Assesment	11th week	1 ½ hrs	30
6	Final Assesment	12th weel	1 ½ hrs	30

ESSENTIAL READINGS : Textbooks, reference books, etc

1. T.H. Cormen, C.E. Leiserson, R.L. Rivest and C.Stein, "Introduction to Algorithms", 3rd Edition, MIT Press, 2009.
2. S. Lipschutz and G.A.V. Pai, "Data Structures", Tata McGraw-Hill, 2010.
3. M.A.Weiss, "Data Structures and Problem Solving using Java", 4th Edition, Addison Wesley, 2009.
4. D. Samanta, "Classic Data Structures", 2nd Edition, PHI, 2009. 5. P. Brass, "Advanced Data Structures", Cambridge University Press, 2008.