

## MCA-26 Data Structures and Algorithms Lab.

### General Course Information

Course Code: MCA-26 Course Credits: 2 Type: Professional Core Lab. Course Contact Hours: 2 hours/week Mode: Lab practice and assignments	<b>Course Assessment Methods (internal: 30; external:70)</b> The internal and external assessment is based on the level of participation in lab. sessions and the timely submission of lab experiments/assignments, the quality of solutions designed for the assignments, the performance in VIVA-VOCE, the quality of lab. file and ethical practices followed. The internal examination is conducted by the course coordinator. The external examination is conducted by external examiner (appointed by the Controller of Examination) in association with the internal examiner appointed by the Chairperson of the Department.
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**Pre-requisites:** Programming in C/C++ language.

### About the Course

This lab. course involves implementation of basic and advance data structures and various operations on these data structures. The objective of the lab course is to train the students to solve the problems related to data structures and choose the appropriate data structure for solving computational problem efficiently.

### Course Outcomes: By the end of the lab course a student would be able to:

- CO1. **Implement** various data structures and the related operations.
- CO2. **Analyse** space and time complexity of algorithms.
- CO3. **Compare** solutions on the basis of the appropriateness of data structure used and the efficiency of the operations implemented.
- CO4. **Integrate** knowledge of data structures to solve real world problems related to data structure and algorithms.
- CO5. **Create** written records for the given assignments with problem definition, design of solution and conclusions.
- CO6. **Demonstrate** ethical practices while solving problems individually or in groups

### List of experiments/assignments

1. Two assignments related to creating and manipulating matrices and linear lists.
2. Two assignments associated with linked list, operations on linked lists and their applications.
3. Two assignments on array and linked implementation of stacks and queues.
4. Two assignments on trees and their applications.
5. Two assignments on graphs and their applications.
6. Two assignments on different searching and sorting methods with their complexity analysis.
7. One assignment on challenging problems on data structures to be given in groups.

### Note:

The actual experiments/assignments will be designed by the course coordinator. One assignment should be designed to be done in groups of two or three students. The assignments must meet the objective of the course and the levels of the given course outcomes. The list of assignments and schedule of submission will be prepared by the course coordinator at the beginning of the semester.