



**MCA I Semester
Problem Solving with C Lab**

Course Objectives:

The purpose of this course is to introduce to students to the field of programming using C language. The students will be able to enhance their analyzing and problem solving skills and use the same for writing programs in C.

Course Outcomes(COs): At the end of the course, student will be able to

- Obtain hands on experience in programming to solve the real time problems.
- Write diversified solutions using C language
- Implement Programs with pointers and arrays, perform pointer arithmetic, and use the pre-processor
- Write programs that perform operations using derived data types
- Identify tasks in which the numerical techniques learned are applicable and apply them to write programs, and hence use computers effectively to solve the task.

Experiment 1

- Write a C Program to calculate the area of a triangle
- Write a C program to find the largest of three numbers using ternary operator
- Write a C Program to swap two numbers without using a temporary variable

Experiment 2

- Write a C program to find the 2's complement of a binary number
- Write a C program to find the roots of a quadratic equation
- Write a C program, which takes two integer operands and one operator from the user, performs the operation and then prints the result. (Consider the operators +,-,*,/, % and use Switch Statement)

Experiment 3

- Write a C program to find the sum of individual digits of a positive integer and, also, find the reverse of the given number.
- Write a C program to generate the first n terms of the Fibonacci sequence
- Write a C program to generate all the prime numbers between 1 and n , where n is a value supplied by the user.

Experiment 4

- Write a C Program to print the multiplication table of a given number
- Write a C Program to read a decimal number and find its equivalent binary number
- Write a C Program to check whether the given number is Armstrong number or not.

Experiment 5

- Write a C program to interchange the largest and smallest numbers in the given array
- Write a C program to implement a liner search on a given set of values
- Write a C program to implement binary search on a given set of values

Experiment 6

- Write a C program to implement sorting of an array of elements
- Write a C program to input two $m \times n$ matrices, check the compatibility and perform addition and multiplication of them.



Experiment 7

Write a C program that uses functions to perform the following operations:

- (a) To insert a sub-string into given main string at a given position
- (b) To delete n characters from a given position in a given string
- (c) To replace a character of string either from beginning or ending or at a specified location.

Experiment 8

Write a C program that uses functions to perform the following operations using Structure:

- (i) Reading a complex number (ii) Writing a complex number (iii) Addition of two complex numbers (iv) Multiplication of two complex numbers

Experiment 9

Write C Programs for the following string operations without using the built in functions:

- (i) to concatenate two strings (ii) to append a string to another string (iii) to compare two strings

Experiment 10

- (a) Write a C Program to find the number of characters in a given string including and excluding spaces
- (b) Write a C Program to copy the contents of one string to another string without using string handling functions
- (c) Write C Program to find whether a given string is palindrome or not.
- (d) Write a C program to find both the largest and smallest number of an array of integers using call by value and call by reference.

Experiment 11

Write a C program using recursion for the following:

- (a) To display sum of digits of given number
- (b) To find the factorial of a given integer
- (c) To find the GCD (greatest common divisor) of two given integers
- (d) To find the Fibonacci sequence

Experiment 12

- (a) Write C Program to reverse a string using pointers.
- (b) Write a C Program to compare two 2D arrays using pointers.
- (c) Write a C program consisting of Pointer based function to exchange value of two integers using passing by address.

Experiment 13

Examples which explores the use of structures, union and other user defined variables.

Experiment 14

- (a) Write a C program which copies one file to another.
- (b) Write a C program to count the number of characters and number of lines in a file.
- (c) Write a C Program to merge two files into a third file, where the names of the files must be entered using command line arguments.