DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

DEPARTMENT: COMPUTER SCIENCE AND ENGINEERING	
Course Title: C Programming Laboratory	**Course Code:** CS12L/CS22L
Credits(L:T:P): 0:0:1	**Core/Elective:** Core
Type of Course: Practical Laboratory	**Total Contact Hours:** 48
CIE Marks: 50	**SEE Marks:** Nil

LAB EXPERIMENTS

NOTE: *Tutor will Design the lab cycle to cover the following concepts.*

1. Understanding programming environment, operating system and source editors.
2. Programs which includes sequential execution involving different C operators.
3. Programs that use control structures including switch-case.
4. Iterative constructs. (do, while, for)
5. Applications of single dimensional array and two dimensional array.
6. String handling and use of unformatted I/O functions.
7. User defined functions, recursive function
8. Introduce the concept of structures, pointers and file handling.

Text Books:

1. Brain W. Kernighan and Dennis M. Richie: The C programming Language, 2nd Edition, PHI, 2012.
2. R.G Dromey, How to solve it by computer, low price edition, 5th edition 2007.
3. E. Balaguruswamy: Programming with ANSI C, 7th Edition, Tata McGraw Hill Publications

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LIST OF EXPERIMENTS – *TENTATIVE*

LAB CYCLE – I

1. Accept two numbers and perform basic arithmetic operation. (+, - *, /, %)
2. Programs to perform mathematical operations using built-in functions.
   (sqrt, abs, fabs, pow)
3. Program to find area/volume of geometrical shapes
   (Circle, square, rectangle, triangle-given three sides, given base and height)
4. Program to convert temperature to Fahrenheit and vice versa.
5. Program to compute simple and compound interest.
6. Given the values of the variables x, y and z, write a program to rotate their values such that x has the value of y, y has the value of z, and z has the value of x.
7. Write a program that reads floating-pointing number and then displays the right-most digit of the integral part of the number.
8. Write a program that reads floating-pointing number, separate and displays the integral and decimal part of the given.

LAB CYCLE- II

1. Program to perform the following using ternary operator
   (a) check if given number is positive or negative
   (b) find the largest of two/three numbers
2. Program to check if given number is even or odd using bitwise & operator
3. Program to perform the following using bitwise operators:
   c = a & b ; d = a | b ; e = ~a
   f = a>>n; g = a<<n; h = a^b
4. Program to find the remainder of a/b without using % operator
5. Program to illustrate the use of postfix/prefix increment/decrement operators.
6. Write a program to print the size of various data types in C.

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LAB CYCLE – III

If statements

1. Write a program to determine whether a given number is Positive / Negative / Zero
2. Write a program to find the largest of two/three numbers
3. Write a program to determine whether a given number is 'odd' or 'even' and print the message NUMBER IS EVEN or NUMBER IS ODD with and without using **else** option.
4. Design, develop and execute a program to find and output all the roots of a given quadratic equation, for non-zero coefficients.
5. Declare the class based on 6 subject marks of a student.
6. Generate electricity bill depending on the Units consumed and varying rates for Units consumed.
7. Write a program to determine whether a given year is leap year or not.

Switch-Case

8. Write a program to input month number and display its respective month in words.
9. Write a program to simulate Simple calculator.

LAB CYCLE – IV

Loop Statement

1. Write a program to sum odd and even numbers up to 'n'
2. Write a program to generate and print first 'n' Fibonacci numbers
3. Write a program to find the sum of digits of a number reducing into single digit
4. Write a program to implement Euclid's algorithm to find the GCD and LCM of two integers and to output the results along with the given integers.
5. Write a program to reverse a given four digit integer number and check whether it is a palindrome or not. Output the given number with suitable message.
6. Write a program to display all the number between 1 and N which are divisible by 8.
7. Write a program to determine whether a given number is Prime or not.

8. Write a program to generate and print all the prime numbers between given range
9. Write a C program to find the value of sin(x) using the series

   $x - x^3/3! + x^5/5! - x^7/7! + x^9/9! - \ldots$

   up to N terms accuracy (without using user defined function).

   Also print sin (x) using library functions.
10. Write a C program to find the value of cos(x) using the series

    $1 - x^2/2! + x^4/4! - x^6/6! + x^8/8! - \ldots$

    Up to N terms accuracy (without using user defined function).

    Also print cos(x) using library function.

LAB CYCLE – V

One-dimensional array

1. Write a C program to input N numbers and perform linear search for a given key number.
2. Design, develop and execute a program in C to input N integer numbers into a single dimension array, sort them in to ascending order using bubble sort technique, and then to print both the given array and the sorted array with suitable headings.
3. Design, develop and execute a program in C to input N integer numbers in ascending order into a single dimension array, and then to perform a binary search for a given key integer number and report success or failure in the form of a suitable message.
4. Write a C program to input N real Numbers and to find mean, variance and standard deviation using appropriate formula.

Two-dimensional array and user-defined functions

1. Write a C program to read two matrices A (M x N) and B(M x N) and perform addition OR subtraction of A and B. Output the given matrices, their sum OR differences..
2. Write a C program to read a matrix A (M x N), find the transpose of the given matrix and output both the input matrix and the transposed matrix.
3. Write a C program to read a matrix A (M x M), find the trace and norm of the matrix and output the input matrix, trace and norm.

4. Write a recursive function to compute the factorial of a Number.

LAB CYCLE – VI

1. Write a program to check whether the given string is palindrome or not without using built-in function. Use unformatted I/O functions.
2. Write a C program to demonstrate the concepts of Pointers.
3. Write file handling programs to illustrate the following concepts:
   a. Read a line of text and store it in a file.
   b. Read the contents of a file and display the same on the monitor.
   c. Copy the content of one file to another.
   d. Write a C program to generate 1000 random integer numbers using built-in function and store then in a file.
4. Write a C program to demonstrate the usage of Structures.

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Mapping of COs and POs

Programming Concepts Laboratory (CS12L/22L)	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	H	H	M	M	L	L	M	L	M	L	H	M
CO2	H	H	H	H	M	L	M	L	M	L	H	H
CO3	H	H	H	H	M	L	M	L	M	L	M	M
CO4	H	H	H	H	M	L	M	L	M	L	M	M
CO5	H	H	H	H	M	L	M	L	H	L	H	H

Note: H - 3 points, M- 2 points, L- 1 point

Mapping of Course and POs:

Programming Concepts Laboratory (CS12L/22L)	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	H	H	H	H	M	L	M	L	M	L	H	M