1/4 B.Tech. FIRST SEMESTER

ME1L2 **C Programming Lab** **Credits: 2**

Lecture: -- **Internal assessment: 25 marks**
Lab Practice : 3 periods/week **Semester end examination: 50 marks**

Objectives:

1. To make the students learn a programming language.
2. To learn problem solving techniques.
3. To teach the student to write programs in C and to solve the problems

Learning outcomes:

At the end of course the student will be able to:

1. Read, understand and trace the execution of programs writing in C language
2. Write the C code for a given algorithm
3. Implement programs with pointers and arrays, perform pointer arithmetic and use the pre- processor
4. Write programs that perform operations using derived data types

Exercise1:

BASICS

1. Write a program to print sample strings like “hello world”, “Welcome to C Programming” with different formats using escape sequences.
2. Write a Program to print different data types in ‘C’ and their ranges.
3. Write a Program to initialize, assignment & printing variables of different data types.

Exercise2:

OPERATORS

1. Write a Program to demonstrate arithmetic operators. (+,-,*,/,%)
2. Write a Program to demonstrate logical operators.(logical AND, logical OR)
3. Write a Program to read radius value from the keyboard and calculate the area of circle and print the result in both floating and exponential notation.
4. Write a Program to calculate simple interest.
5. Write a Program to convert temperature. (Fahrenheit –Centigrade and vice versa)

Exercise3:
OPERATORS

1. Write a Program to demonstrate relational operators.(<,>,<=,>=,==,!=)
2. Write a program to check equivalence of two numbers using conditional operator.
3. Write a Program to demonstrate pre increment and post increment.(++a, a++ where a is a value to be initialized)
4. Write a Program to demonstrate pre decrement and post decrement.(--a, a-- where a is a value to be initialized)
5. Write a program for computing the volume of sphere, cone and cylinder assume that dimensions are integer's use type casting where ever necessary.

Exercise4:
DECISION STATEMENTS

1. Write a Program to read marks of a student in six subjects and print whether pass or fail (using if-else).
2. Write a Program to calculate roots of quadratic equation (using if-else).
3. Write a Program to calculate electricity bill. Read starting and ending meter reading. The charges are as follows.

No. of Units Consumed	Rate in(Rs)
1-100	1.50 per unit
101-300	2.00 per unit for excess of 100 units
301-500	2.50 per unit for excess of 300 units
501-above	3.25 per unit for excess of 500 units

Exercise5:
SWITCH OPERATIONS

1. Write a Program to perform arithmetic operations using switch case.
2. Write a Program to display colors using switch case (VIBGYOR).
3. Write a Program to display vowels and consonants using switch case.
4. Write a Program to display names of days in a Exercise using switch case.

Exercise6:
BASIC LOOP OPERATIONS

Do the Following Programs Using for, while, do-while loops.

1. Write a program to calculate sum of individual digits of a given number.
2. Write a program to check whether given number is palindrome or not.
3. Write a program to print prime numbers in the given range.
4. Write a program to display multiplication tables from 1 to 10 except 3 and 5.

Exercise7:
ADVANCED LOOPS

1. Write a program to print the Fibonacci series for given 'N' value.
2. Write a program to check whether a given number is a Fibonacci number or not.
3. Write a program to read 2 numbers x and n then compute the sum of the Geometric Progression. $1+x+x^2+x^3+ \text{ - - - - - - - } +x^n$
4. Write a program to print the following formats.

```
1                    *
1 2                  *  *
1 2 3                *  *  *
1 2 3 4              *  *  *  *
```

Exercise8:
1-D ARRAYS

1. Write a program to store 10 elements in the 1-D array and print sum of the array.
2. Write a program to print minimum and maximum elements in the 1-D array.
3. Write a program to count no. of positive numbers, negative numbers and zeros in the array.
4. Write a program to search the given element by using linear search.
5. Write a program to sort the given elements using bubble sort technique.

Exercise9:
2-D ARRAYS

1. Write a program to perform matrix addition and matrix subtraction.
2. Write a program to perform matrix multiplication by checking the compatibility.
3. Write a program to print the transpose of a matrix.

Exercise10:
STRINGS

1. Write a program to perform various string manipulations using built-in functions.
2. Write a program to print the given strings in ascending order.
3. Write a program to verify the given string is palindrome or not (without built-in functions, with using built-in functions).
4. Write a program to concatenate two strings using arrays.

Exercise 11:

MATH FUNCTIONS AND I/O FUCNTIONS

1. Write a program to read values from keyboard and find the values using abs(),sqrt(),floor(),ceil()and pow().
2. Write a program to read and display a value using getch() and putch().
3. Write a program to read and display a value using getchar(), putchar(),gets()\ and puts().

Exercise 12:

FUNCTIONS

1. Write a program to find sum of two numbers using functions.
2. Write a program to find product of two numbers using functions without arguments, without return type.
3. Write a program to find difference of two numbers using functions without arguments, with return type.
4. Write a program to find sum of two numbers using functions with arguments &without return type.
5. Write a program to find product of two numbers using functions with arguments, with return type

Exercise13:

FUNCTIONS AND RECURSION

1. Write a program to swap two numbers using

   a) Call By Value B) Call By Reference.

2. Write a program to calculate factorial, gcd using recursion and non-recursion functions.
3. Write program to perform arithmetic operations using pointer.
4. Write a program matrix addition using pointers.

Exercise14:

STRUCTURES

1. Write a program to create structure for an account holder in a bank with following

   Fields: name, account number, address, balance and display the details of five account holders.

2. Write a program to find total marks of individual student and average marks for 10 students using structures.
3. Write a program to create structure called traveler and members of structure are train no, coach no, seat no, source ,destination , gender, age, name and departure date.
4. Write a program to illustrate passing an entire structure to a function.

Exercise15:
FILE OPERATIONS USING COMMAND LINE ARGUMENTS

1. Write a program which copies the contents of one file to another file using command line arguments.
2. Write a program to reverse the first n characters in a file use command line arguments.

Reference Books :

1. Problem Solving and Program Design in C, 4th edition, by jeri R. Hanly and Elli B.Koffman.
2. Programming in C by Pradip Dey, Manas Ghosh 2nd edition Oxford University Press.
3. E.Balaguruswamy, Programming in ANSI C 5th Edition McGraw-Hill
4. Gray J.Brosin, A first book of ANSI C, 3rd edition Cengagedelmer Learning India P.Ltd
5. AL Kelly, Iraphol, Programming in C,4th edition Addison-Wesley -professional