1/4 B.Tech. SECOND SEMESTER

EM2L2 **C PROGRAMMING LAB** **Credits: 2**

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

- To make the student learn a programming language.
- To teach the student to write programs in C solve the problems.

Learning Outcomes:

- The student will be able to
- Read, understand and trace the execution of programs written in C language.
- Write the C code for a given algorithm.
- Implement Programs with pointers and arrays, perform pointer arithmetic, and use the preprocessor.
- Write programs that perform operations using derived data types.

Recommended Systems/Software Requirements:

- Intel based desktop PC
- ANSI C Compiler with Supporting Editors \

Week1: 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.

Week2: 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)

Week3: 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.

Week4: 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

Week5: 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 week using switch case.

Week6: 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.

Week7: 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.

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1                    *
1 2                * *
1 2 3              * * *
1 2 3 4          * * * *
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Week8: 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.

Week9: 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.

Week10: 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.

Week 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().

Week 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.

Week13: 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.

Week14: 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.

Week15: 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.

Learning resources

Text books :

1. Problem Solving and Program Design in C, Jeri R. Hanly, Ellot B. Koffman, 5th Edition, Pearson.

2. Programming in C, P.Dey & M. Ghosh, Oxford University Press.