Program : **Diploma in Electronics/ Electronics and Communication Engineering**	
Course Code :**3049**	Course Title: **Fundamentals of C Programming Lab**
Semester :**3**	Credits: **1.5**
Course Category: **Program Core**	
Periods per week: **3 (L:0, T:0, P:3)**	Periods per semester:**45**

CourseObjectives:

- To make use of programming fundamentals using C language.
- To build a strong foundation to learn other programming languages.

Course Prerequisites:

Topic	Course Code	Course Name	Semester
Basic principles and theorems of Engineering Mathematics		Mathematics I &II	1 & 2
Basic functions and features of Computer, Operating system and Internet applications, basic programming skills in Python.		Introduction to IT systems Lab	1

Course Outcomes:

On completion of the course, the student will be able to:

COn	Description	Duration (Hours)	Cognitive Level
CO1	Make use of variousdata types, I/O statements and basic operators in C programming	**11**	Applying
CO2	Apply decision making and loop statements in C programming.	**13**	Applying
CO3	Develop C programs based on arrays.	**9**	Applying
CO4	Develop C programs using pointers, string handling functions and user-defined functions.	**9**	Applying
	Series Test	**3**	

CO-PO Mapping:

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	3						
CO2	3		3	3			
CO3	3	3	3	3			
CO4	3	3	3	3			

3-Strongly mapped, 2-Moderately mapped, 1-Weakly mapped

Course Outline:

Module Outcomes	Description	Duration (Hours)	CognitiveLevel
CO1	**Make use of various data types, I/O statements and basic operators in C programming**		
M1.01	Demonstrate output and input functions.	5	Understanding
M1.02	Demonstrate different fundamental data types in C.	3	Understanding
M1.03	Solvesimple problem statements using operators.	3	Applying
	Suggested experiments 1. Write a C program to perform addition, subtraction, division and multiplication of two numbers. 2. Write a program to find the roots of quadratic equation. Write a Program to read height, width and depth of a cube, then calculate and display the volume of the Cube.		
CO2	**Apply decision making and loop statements in C programming**		
M2.01	Solve problem statements in C using flow control statements - if, if-else, nested if, switch.	8	Applying
M2.02	Solve problem statements using loop statements - while, do … while and for loop.	5	Applying
	Series Test 1	1.5	
	Suggested Experiments 1. Write a program to find the largest and smallest among three entered numbers and also display whether the identified largest/smallest number is even or odd. 2. Write a program to find whether a character is consonant or vowel using switch statement 3. Write a program to generate Fibonacci series.		

CO3	**Construct C programs based on arrays.**		
M3.01	Make use of one dimensional array operations - largest, smallest and compute sum & average of array elements	3	Applying
M3.02	Write programs to perform two dimensional array operations - transpose of matrix, matrix addition, matrix subtraction	6	Applying
	Suggested Experiments 1. Write a Program find the sum of elements of array and also display the array elements in reverse order. 2. Write a program to sort a given array in ascending order and find the largest and second largest elements 3. Write a program to read two matrixes then multiply them after checking the condition for matrix multiplication.		
CO4	**Develop C programs usingPointers,String handling functions and user-defined functions.**		
M4.01	Make use of Pointers in programming	3	Applying
M4.02	Implement string manipulation functions - strcpy( ), strcat( ), strlen( ), strcmp( ).	3	Applying
M4.03	Solve problems using‘User-defined functions’	3	Applying
	Suggested Experiments 1. Write a program to find biggest among three numbers using pointer. 2. Write a program to concatenate two given strings using built in functions 3. Write a program to find the diagonal sum, sum of columns, sum of arrays and sum of elements of a matrix using user defined functions.		
	Series Test 2	1.5	

**** - Suggested Open Ended Projects**

(Students have to do open ended experimentsduring the course for the purpose of continuous evaluation. This experiment shall be included in the bona-fide record.)

Example: Develop program such as

- Student CGPAcalculator,
- Consumer billing,
- Candidate list sorting

Text / Reference:

T/R	Book Title/Author
T1	Let Us C – YashavantKanetkar, BPB Publications
R2	Programming in ANSI C, E. Balagurusamy, Tata McGraw Hill

R3	A Text Book on C, E. Karthikeyan , PHI Learning Pvt. Ltd
R4	Programming in C D. Ravichandran, New Age International Publishers
R5	C. Programming Language, Brian W. Kernighan and Dennis M. Ritchie, Prentice Hall

Online Resources:

Sl.No	Website Link
1	http://freecomputerbooks.com/The-C-Programming-Language.html
2	https://www.tutorialspoint.com/cprogramming/index.htm
3	https://www.guru99.com/c-programming-tutorial.html
4	https://www.cprogramming.com/
5	http://www.zentut.com/c-tutorial/

Sample Questions to Test Outcomes

1. ImplementaCprogramtofindsumandaverageofallelementsin an integer array of size MxN where M,N and array elements can be input while the program isexecuting.
2. Implement a program to check whether the given string is a Palindrome or not.
3. Write a program to accept a string and count the number of vowels present in this string