

Code: 1BPOPL107/207**Course: C Programming Lab****Credits: 1****L:T:P – 0:0:2****SEE: 50 Marks****CIE: 50 Marks****SEE Hours: 3****Max. Marks: 100**

Prerequisites if any	Nil
Learning objectives	To acquire fundamental programming concepts, methodologies, and structures that are essential for developing efficient and reliable C programs.

Course Outcomes:*On the successful completion of the course, the student will be able to*

COs	Course Outcomes	Bloom's level
CO1	Develop programs in C to solve computational problems.	Apply
CO2	Implement C language programs for real-world applications.	Analyse
CO3	Build a document consisting of experiment setup, design, implementation and results with inferences.	Create

Mapping with POs and PSOs:

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11		PSO1	PSO2
CO1	3	3	2	2	2				1	1			3	2
CO2	3	3	3	2	2	1	1		2	2	1		3	3
CO3	2	2	3	2	1			1	2	3	1		2	2

Mapping Strength:**Strong– 3****Medium – 2****Low – 1**

List of Experiments

Sl.No	CO	Experiment
PART – A CONVENTIONAL EXPERIMENTS		
1	CO1	A robot needs to find how far it must travel between two points on a 2D plane. Develop a C program to calculate the straight-line distance between the given coordinates.
2	CO1	Develop a C program that takes a student's marks as input and displays their grade based on the following criteria: 90 and above: Grade A 75 to 89: Grade B 60to74:GradeC 50 to 59: Grade D Below50:GradeF Choose a suitable control structure to implement this logic efficiently.
3	CO1	Develop a C program that takes a unique identification input like PAN Number, AADHAR_Number, APAAR_Id, Driving License, Passport and checks it against a set of stored KYC records. Based on the input, display whether the individual is verified or not. Use an appropriate control structure to handle multiple possible ID matches. Assume all Unique identification are of integer type.
4	CO1	A math app needs to determine the type of roots for a quadratic equation based on user input. Develop a C program to calculate and display the roots based on the given coefficients.
5	CO1	A sensor in a robotic arm needs to calculate the angle of rotation in real-time, but the hardware doesn't support built-in trigonometric functions. Develop a C program to approximate the value of $\sin(x)$ using a series expansion method for improved performance.
6	CO1	Develop a C program that accepts a course description string and a keyword from the user. Search whether the keyword exists within the course description using appropriate string functions. If found, display: "Keyword '<keyword>' found in the course description." Otherwise, display: "Keyword '<keyword>' not found in the course description."
7	CO1	Develop a C program that takes marks for three subjects as input. Use a function to check if the student has passed (minimum 40 marks in each subject).Display the average and whether the student passed or failed.
8	CO1	In an ATM system, two account balances need to be swapped temporarily for validation. Develop a C program that accepts two balances and uses a function with pointers to swap them. Display the balances before and after swapping.

PART-B		
TYPICAL OPEN-ENDED EXPERIMENTS		
1	CO2 CO3	A college library has a digital book shelf system where each book is assigned a unique Book ID. The book shelf is organized in ascending order of Book IDs. Develop a C Program to quickly find whether a book with a specific Book ID is available in the shelf.
2	CO2 CO3	A sports teacher has recorded the scores of students in a 100-meter race. To prepare the result sheet, the teacher wants the scores arranged in descending order (from highest to lowest). Develop a C program to sort the scores.
3	CO2 CO3	A small warehouse tracks how many units of different products are shipped from multiple branches. Another dataset shows how much revenue each product generates per unit. Develop a C program which combines these datasets to calculate the total revenue generated by each branch.
4	CO2 CO3	A basic mobile contact manager stores first and last names separately. For displaying full names in the contact list, you need to join them manually. Additionally, the system must check the length of each full name to ensure It fits the screen. Perform these operations by developing a C program without using built- in string functions.
5	CO2 CO3	A currency exchange booth allows users to convert between two currencies. Before confirming the exchange, the system simulates a swap of the values to preview the result without actually changing the original data. In other cases, it updates the actual values. Develop a C program that implements both behaviours using Call by Value and Call by reference
6	CO2 CO3	A local library needs to store and display detail so fits books ,including title, author ,and year of publication. Design a structure that can hold these details and develop a C program to display a list of all books entered.

Text book:

1. Hassan A fyouni, BehrouzA. Forouzan. "A Structured Programming Approach in C", 4th Edition, Cengage.

Reference books:

1. Schildt, Herbert. "C the complete reference", 4th Edition, McGrawHill. Brian W. Kernighan and DennisM. Ritchie, The 'C' Programming Language, 2nd edition, Prentice Hall of India.

Online Resources:

1. Introduction to Programming in C [https://onlinecourses.nptel.ac.in/noc23_cs02/preview]
2. C for Everyone: Programming Fundamentals [<https://www.coursera.org/learn/c-for-everyone>]
3. Computer Programming Virtual Lab [<https://cse02-iiith.vlabs.ac.in/exp/pointers/>]

4. C Programming: The ultimate way to learn the fundamentals of the C language [<https://www.pdfdrive.com/c-programming-the-ultimate-way-to-learn-the-fundamentals-of-the-c-language-e187584209.html>]
5. C Programming: The Complete Reference [<https://viden.io/knowledge/programming-in-c-language/attachment/28313/c-the-complete-reference-herbert-schildt-4th-edition-pdf/preview>]