Course Code & Name	26CAPL1001 Problem Solving Lab using C		
Teaching Hours /week (L: T:P: R)	0:0:4:0	Credits	2
CIE Marks	50	ESE Marks	50
Course Type	Lab (PCL)	Exam Hours	3
Corequisites	26CAPC1002		

Course Objectives:

1. To develop problem-solving skills by applying fundamental programming concepts such as control structures, functions, arrays, pointers, and file handling using the C programming language.
2. To gain practical experience in writing, debugging, and optimizing C programs to solve computational and real-world problems efficiently.

Course Outcomes (COs)

At the end of the course students should be able to:

Course Outcome		Bloom's Knowledge Level (KL)
CO 1	Develop programs using fundamental programming constructs such as data types, operators, control structures	K3
CO 2	Implement programs using arrays, strings, structures, and unions for efficient data handling.	K3
CO 3	Demonstrate the use of pointers for dynamic memory management.	K3
CO 4	Design and develop programs to perform file handling operations	K3
CO5	Apply C programming constructs and data handling techniques to develop efficient solutions to computational problems.	K3

Note: *K1- Remember, K2- Understand, K3- Apply, K4- Analyse, K5- Evaluate, K6- Create*

CO-PO Mapping Table (Mapping of Course Outcomes to Program Outcomes)

C0 #	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8
CO 1	3	2	1	2	1	-	-	1
CO 2	3	3	2	3	2	-	-	-
CO 3	3	3	3	3	2	-	-	2

CO 4	3	3	3	3	3	-	-	3
CO5	3	3	3	2	1	-	-	2

Note: *1: Slight (Low), 2: Moderate (Medium), 3: Substantial (High), - : No Correlation*

Course Assessment Method

(CIE: 50 marks, ESE: 50 marks)

Continuous Internal Evaluation Marks (CIE)

Attendance	Continuous Assessment (Lab Experiments/Project, Viva, Completion of Lab Reports / Project Report)	Internal Lab Examination-1	Internal Lab Examination- 2	Total
8	**22**	**10**	**10**	**50 Marks**

End Semester Examination Marks (ESE)

Submission of Record: Students shall be allowed for the end semester examination only upon submitting the duly certified record.

Procedure/ Algorithm/ Flowchart	Conduct of experiment/ Execution of work	Quality of Output	Viva voce	Record	Total
10	**15**	**10**	**10**	**5**	**50 Marks**

Continuous Assessment (22 Marks)

1. Conduct of Lab Experiments/Project (12 Marks)
2. Timely Completion of Lab Reports/ Project Reports (5 Marks)
3. Viva Voce (5 Marks)

Final Marks Averaging: The final marks for conduct of experiments, viva, and records are the average of all the specified experiments in the syllabus.

Evaluation Pattern for End Semester Examination (50 Marks)

1. Procedure/Algorithm/Flowchart (10 Marks)
2. Conduct of Experiment/Execution of Work (15 Marks)
3. Quality of Output (10 Marks)
4. Viva Voce (10 Marks)
5. Record (5 Marks)

SYLLABUS

Expt. No.	List of Experiments
1	Write a program in C to i) Read two numbers, add them and display their sum ii) Read the radius of a circle, calculate its area and display it iii) Evaluate the arithmetic expression ((a -b / c * d + e) * (f +g)) and display its solution. Read the values of the variables from the user through console.
2	Read 3 integer values and find the largest among them. Read a Natural Number and check whether the number is prime or not.
3	Read a Natural Number and check whether the number is Armstrong or not.
4	Read n integers, store them in an array and find their sum and average.
5	Read n integers, store them in an array and sort the elements in the array.
6	Read n integers, store them in an array and search for an element in the array
7	i) Read a string (word), store it in an array and check whether it is a palindrome word or not. ii) Read two strings (each one ending with a $ symbol), store them in arrays and concatenate them without using library functions. iii) Read a string (ending with a $ symbol), store it in an array and count the number of vowels, consonants and spaces in it.
8	Using structure, read and print data of n employees (Name, Employee Id and Salary) Declare a union containing 5 string variables (Name, House Name, City Name, State and Pin code) each with a length of C_SIZE (user defined constant). Then, read and display the address of a person using a variable of the union.
9	Do the following using pointers i) Add two numbers ii) Swap two numbers using a user defined function
10	i) Create a file and perform the following ● Write data to the file ● Read the data in a given file & display the file content on console ● Append new data and display on console ii) Open a text input file and count number of characters, words and lines in it; and store the results in an output file.

Text Books				
Sl. No	**Title of the Book**	**Name of the Author/s**	**Name of the Publisher**	**Edition and Year**
1	Programming in ANSI C	E. Balagurusamy,	Tata Mc Graw Hill	4th Edition
2	Schaums Outline series- "Programming with C"	Byran Gotfried	McGraw Hill	3rd Edition

Reference Books				
Sl. No	**Title of the Book**	**Name of the Author/s**	**Name of the Publisher**	**Edition & Year**
1	Let us C	Yashavant P, Kanetkar	BPB Publications	5th Edition 2004
2	Computer Fundamentals and Programming in C	Anita Goel and Ajay Mitta	Pearson India Ltd.	First Edition 2013

Web References/ Video Links (NPTEL, SWAYAM…)	
Sl.No	**Link ID**
1	https://www.w3schools.com/c/
2	https://www.tutorialspoint.com/cprogramming/index.htm
3	https://www.geeksforgeeks.org/c-programming-language/