Course Code & Name	26CAPC1002 Programming in C		
Teaching Hours /week (L: T:P: R)	3:1:0:0	Credits	4
CIE Marks	40	ESE Marks	60
Course Type	Theory (PCC)	Exam Hours	3
Prerequisites (if any)	-		

Course Objectives:

1. To build a strong foundation in C programming concepts, including data types, control structures, functions, and arrays.
2. To develop the ability to write, compile, debug efficient C programs for problem-solving.

Course Outcomes (COs)

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

Course Outcomes		Bloom's Knowledge Level (KL)
CO 1	Explain the basic structure, syntax, and semantics of the C programming language.	K2
CO 2	Develop programs using decision-making statements, loops and functions in C.	K3
CO 3	Develop and implement programs using one-dimensional and multi-dimensional arrays to efficiently store and manipulate data.	K3
CO 4	Implement programs using pointers, structures, union, and file handling to solve real-world 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)

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

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

Course Assessment Method

(CIE: 40 marks, ESE: 60 marks)

Continuous Internal Evaluation Marks (CIE)

Attendance	Assignment/ Micro-project	Internal Examination-1 (Written)	Internal Examination- 2 (Written)	Total
8	12	10	10	40 Marks

End Semester Examination Marks (ESE)

In Part A, all questions need to be answered and in Part B, each student can choose any one full question out of two questions.

PART A	PART B	TOTAL
■ 2 Questions from each module. ■ Total of 8 Questions, each carrying 3 marks **(8x3 =24 marks)**	■ Each question carries 9 marks. ■ Two questions will be given from each module, out of which 1 question should be answered. ■ Each question can have a maximum of 3 subdivisions. **(4x9 = 36 marks)**	**60 Marks**

SYLLABUS

Module No.	Syllabus Description	Contact Hours
1	Basic structure of C program: Character set, Tokens, Identifiers in C, Variables and Data Types , Constants, Console IO Operations, printf and scanf. Operators and Expressions: Expressions and Arithmetic Operators, Relational and Logical Operators, Conditional operator, sizeof operator, Assignment operators, and Bitwise Operators. Operators Precedence, Macros in C.	10
2	Control Flow Statements: If Statement, Switch Statement, Unconditional Branching using goto statement, While Loop, Do While Loop, For Loop, Break, and Continue statements.(Simple	12

	programs covering control flow). Basics of Functions: Understand the concept of functions, their definition, declaration, and usage in C programming. Parameter Passing Techniques: Call by Value and Call by Reference. (Assignments can be given to find errors in code snippets and correct it)	
3	Arrays Declaration and Initialization, 1-Dimensional Array, 2-Dimensional Array. String processing: In built String handling functions(strlen, strcpy, strcat and strcmp, puts, gets). Structure and Union. Introduction to Pointers. Accessing the address of a variable, Declaring pointer variable. Dynamic Memory Allocation: malloc(), calloc(), realloc(), free(). (Assignments can be given to find errors in code snippets and correct it)	**14**
4	File Operations: open, close, read, write, append. In built file handling functions (rewind() ,fseek(), ftell(), feof(), fread(), fwrite(), simple programs covering file operations. (Assignments can be given to find errors in code snippets and correct it)	**12**

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 McGraw-Hill	9th Edition
2	Schaums Outline series- “Programming with C”	Byran Gotfried	McGraw Hill	4th Edition

Reference Books				
Sl. No	**Title of the Book**	**Name of the Author/s**	**Name of the Publisher**	**Edition & Year**
1	Programming in C	A. N. Kamthane	Pearson Education	3rd Edition (2015)
2	The C programming language	Brian W Kernighan & Dennis Ritchie	Prentice Hall	2nd Edition, (2015)
3	Programming in C	Reema. Thareja	Oxford University Press	2nd Edition (2016)

Web References/ Video Links (NPTEL, SWAYAM…)	
Sl.No	**Link ID**
1	https://www.edx.org/course/programming-basics-iitbombayx-cs101-1x
2	http://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-087-practical-programming-in-c-january-iap-2010/
3	https://onlinecourses.nptel.ac.in/noc23_cs02/preview
4	https://onlinecourses.nptel.ac.in/noc23_cs53/preview
5	https://www.coursera.org/learn/c-for-everyone?

Course Level Assessment Questions

Course Outcome 1 (CO1):

1. What is the purpose of the header files and the main() function in C?
2. Differentiate between keywords and identifiers in C with suitable examples.
3. What are format specifiers in C? Write any four commonly used ones and their purpose.
4. Write a C expression using the conditional (ternary) operator and explain how it works.
5. What are bitwise operators in C? List all bitwise operators and explain the function of any two.

Course Outcome 2 (CO2):

1. Write a C program to read a number and display whether it is positive, negative, or zero using an if-else statement.

2. Write a C program using a while loop to find the sum of digits of a given integer.
3. Explain the purpose of the break and continue statements in loops with examples.
4. Differentiate between built-in and user-defined functions in C with suitable examples.
5. Explain Call by Value and Call by Reference in C with example programs.

Course Outcome 3 (CO3):

1. What is the difference between a 1-D array and a 2-D array? Write a program to add two 2×2 matrices.
2. Explain the use of the following string handling functions with examples: strlen(), strcpy(), strcat(), strcmp().
3. Define a structure in C. How is it different from an array? Give syntax and example.
4. Explain the relationship between arrays and pointers in C with an example.
5. Write a C program that uses malloc() to allocate memory for an array of integers and display the entered elements.

Course Outcome 4 (CO4):

1. Explain the steps involved in opening and closing a file in C. What are the different file opening modes?
2. Write a C program to count the number of characters, words, and lines in a given text file.
3. Write a C program to copy the contents of one file into another.
4. Write a C program to append new data to an existing text file without overwriting its previous contents.
5. Describe the purpose of the following functions with examples: rewind(), fseek(), ftell(), feof()

Focus on Excellence

Model Question Paper

Reg No.:_____ Name:_____

FEDERAL INSTITUTE OF SCIENCE AND TECHNOLOGY

MCA Integrated S1 (R,S) Examination ---------- 2026 (2026 Scheme)

Course Code: 26CAPC1002

Course Name: Programming in C

Max. Marks: 60 Duration: 3 Hours

PART A

Answer all questions, each carries 3 marks.

		CO	Marks
1	What is the difference between assignment and equality operators?	CO1	(3)
2	With a suitable example, explain the use of Conditional operators.	CO1	(3)
3	Distinguish between Break and Continue statements.	CO2	(3)
4	Define formal parameters and actual parameters. Illustrate with examples.	CO2	(3)
5	Explain any three string handling functions using examples.	CO3	(3)
6	Write a C program to find the largest element in an array.	CO3	(3)
7	Distinguish between text mode and binary mode operation of a file.	CO4	(3)
8	Explain the use of the fseek() function.	CO4	(3)

PART B

(Answer any one full question from each module, each question carries 9 marks)

Module I

9	a. Explain arithmetic, logical and bitwise operators with examples.	CO1	(5)
	b. Write a program to find the sum of digits of a number.	CO1	(4)

OR

10	a. Explain different data types in C with their memory requirements.	CO1	(3)
	b. Explain scanf() function including its argument list and return type.	CO1	(4)
	c. What is a static variable? When should it be used?	CO1	(2)

Module II

11	a. Write a program to print the sum of the first 10 natural numbers.	CO2	(6)
	b. Receive a number from the user and print whether it is positive, negative or zero.	CO2	(3)

OR

12	Explain parameter passing techniques such as Call by Value and Call by Reference with suitable examples.	CO2	(9)

Module III

13	a. Write a C program to find the second largest element in an array.	CO3	(5)
	b. Explain how a single dimensional array is initialized. Illustrate with an example	CO3	(4)

OR

14	a. Write a C program to create a structure containing fields: name, price, quantity and total amount. Use separate functions to read and print the data.	CO3	(6)
	b. Explain the concept of pointers in C.	CO3	(3)

Module IV

15	Explain file handling functions in C with examples.	CO4	(9)

OR

16	a. Explain the different modes of operations performed on a file in C language.	CO4	(4)
	b. Write a program in C to copy the contents of one file into another.	CO4	(5)

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