Semester:	I/II	**Course Type:**	IESC		
Course Title: Introduction to C Programming					
Course Code:	25PLT15B/25PLT25B			**Credits:**	4
Teaching Hours/Week (L:T:P:S)			3:0:2:1	**Total Hours:**	40 +(10-12 lab slots)
CIE Marks:	50	**SEE Marks:**	50	**Total Marks:**	100
SEE Type:	Theory			**Exam Hours:**	3

I. Course Objectives

This course will enable students to:

- Familiarize with writing of algorithms, flowchart and fundamentals of C.
- Use of different Branching statements and loops
- Use and implement data structures like arrays and structures.
- Implement different programs using functions.
- Define and use of pointers with simple applications.

II. Teaching-Learning Process (General Instructions)

These are sample Strategies, which teachers can use to accelerate the attainment of the various course outcomes.

1. Lecturer method (L) need not to be only traditional lecture method, but alternative effective teaching methods could be adopted to attain the outcomes.

2. Use of Video/Animation to explain functioning of various concepts.

3. Encourage collaborative (Group Learning) Learning in the class.

4. Ask at least three HOT (Higher order Thinking) questions in the class, which promotes critical thinking.
5. Adopt Problem Based Learning (PBL), which fosters student's Analytical skills, develop design thinking skills such as the ability to design, evaluate, generalize, and analyze information rather than simply recall it. 6. Introduce Topics in manifold representations.

7. Show the different ways to solve the same problem and encourage the students to come up with their own creative ways to solve them.

8. Discuss how every concept can be applied to the real world and when that's possible, it helps to improve the student's understanding.

9. Use https://pythontutor.com/visualize.html#mode=edit in order to visualize the operations of C Programs

III. COURSE CONTENT	
III(a). Theory PART	
Module-1: Introduction.	8 Hours
Introduction to computers: Definition, Characteristics of computers, Stored program concept, History of computers, Classification of computers, Applications of computers, Basic organization of computers, Operating Systems, and Networking. **Programming Basics & Overview of C:** Introduction, Problem solving. Introduction to C, Basic structure of C program, Programming style. **Textbook 1: Chapter 1, Textbook 2: Chapter 1.**	
RBT Levels: 1	
Module-2: Basics of C.	8 Hours
C-tokens and Data types: Introduction, Character set, C Tokens, Declaration of variables, Storage class, Assigning values to variables, Symbolic constants. **Managing I/O operations and operators:** Managing I/O operations, Operators and Expressions. **Textbook 2: Chapter 2 & 3.**	
RBT Levels: 1,2	
Module-3: Control statements	8 Hours
Branching statements: Conditional and Un conditional branching statements with programming examples. **Looping statements:** Looping statement-for, while and do while, break and continue statements with programming examples. **Textbook 2: Chapter 5.**	
RBT Levels:2,3,4	
Module-4: Arrays and Strings.	8 Hours
Arrays: One-Dimensional Array, Two-Dimensional Arrays (Declaration and Compile Time and Run Time Initialization), reading and displaying arrays, Searching and Sorting. **Strings:** Introduction, Character Arrays, Declaring and Initializing String Variables, Reading Strings from Terminal, Writing Strings to Screen. Various String Handling Functions with programming examples. **Textbook 2: Chapter 7 & 8. Textbook 1: Chapter 11 & 12.**	
RBT Levels:2,3,4	
Module-5: UDF, Pointers and UDT.	8 Hours
User Defined Functions: Need for Functions, Types of functions, function definition, declaration and its scope, Category of functions. **Pointers:** Declaration and Initialization of pointers, Obtaining a value of a pointer variable, programming examples on pointers. **User defined data types**: Introduction to structures and unions. Declaration and Initializing of variables, Accessing structures and unions with programming examples. **Textbook 2: Chapter 9, 10 & 11. Textbook 1: Chapter 13 & 14.**	
RBT Levels:2,3,4	

III(b). PRACTICAL PART	
Sl. No.	**Experiments / Programs**
1	Write a C Program to find i) Area of triangle when 3 sides are given ii) Simple Interest when P, T,R are given.

2	Compute the roots of a quadratic equation by accepting the coefficients. Print appropriate messages.
3	An electricity board charges the following rates for the use of electricity: for the first 200 units **Rs.2.50** paisa per unit: for the next 100 units Rs.**3.00** per unit: beyond 300 units Rs **4.50** paisa per unit. All users are charged a minimum of Rs.100 as meter charge. If the total amount is more than Rs 500, then an additional surcharge of 15% of total amount is charged. Write a program to read the name of the user, number of units consumed and print out the charges.
4	Simulation of a Simple Calculator.
5	Write a C Program to generate prime numbers up to a given range.
6	Compute sin(x)/cos(x) using Taylor series approximation. Compare your result with the built-in library function. Print both the results with appropriate message.
7	Develop C Program to sort the given set of N integer numbers, using Bubble Sort technique.
8	Develop a C program to find Trace of a Matrix by validating the rules.
9	Write functions to implement string operations such as copy and concatenate using user defined functions.
10	Implement structures to read, write and compute average- marks of the students, list the students scoring above and below the average marks for a class of 5 students.

IV. COURSE OUTCOMES

CO1	Adopt the basic constructs of C language.
CO2	Choose suitable syntax for various problems.
CO3	Make use of various controls statements.
CO4	Construct programming solutions for various basic problems.
CO5	Design programs using problem solving skills.

V. CO-PO-PSO MAPPING (mark H=3; M=2; L=1)

PO/PSO	1	2	3	4	5	6	7	8	9	10	11	12	S1	S2	s
CO1	2		1												
CO2	2		1												
CO3	2		2												
CO4	2		2												
CO5	2		2												

VI. Assessment Details (CIE & SEE)

General Rules: Refer CIE and SEE guidelines based on course type for autonomous scheme 2023 Dated on 10-02-2025.

Continuous Internal Evaluation (CIE): Refer Annexure section 2

Semester End Examination (SEE): Refer Annexure section 2

VII. Learning Resources

VII(a): Textbooks:

Sl. No.	Title of the Book	Name of the author	Edition and Year	Name of the publisher
1	Computer fundamentals and programming in C	Reema Thareja	3rd Edition, 2023	Oxford Unversity Press, New Delhi
2	Programming in ANSI C	E. Balaguruswamy	7" Edition	Tata McGraw- Hill

VII(b): Reference Books:				
1	The 'C' Programming Language	Brian W. Kernighan and Dennis M. Ritchie	**-**	Prentice Hallof India
2	Computer Fundamentals & C Programming	Sumitabha Das		Mc Graw Hill Education

VII(c): Web links and Video Lectures (e-Resources)

1. elearning.vtu.ac.in/econtent/courses/video/BS/15PCD23.html
2. https://nptel.ac.in/courses/106/105/106105171/ MOOC courses can be adopted for more clarity in understanding the topics and verities of problem solving method
3. https://tinyurl.com/4xmrexre

VIII: Activity Based Learning / Practical Based Learning/Experiential learning

Activity Based Learning (Suggested Activities in Class)/ Practical Based learning

- Quizzes
- Programming Assignments
- Seminar