

Course Handout

Institute/School Name	Chitkara University Institute of Engineering and Technology		
Department Name	Department of Computer Science & Engineering		
Programme Name	Bachelor of Engineering (B.E.), Computer Science & Engineering		
Course Name	Structured Programming Concepts	Session	June 2026- Dec 2026
Course Code	26CSE0105	Semester/Batch	1st/ 2026
L-T-P (Per Week) /No. of Hours (Per Week)	2-0-4/10	Course Credits	4
Pre-requisite	N/A	NHEQF Level	4.5
Course Coordinator	Dr. Gaganpreet Kaur	SDG Number	4, 9

1. Scope and Objectives of the Course

The scope of this course encompasses the fundamentals of computational problem solving, logic development, and a comprehensive introduction to the C programming language. It includes basic syntax, operators, and control structures (decision-making and iterative statements) and extends to modular programming with functions, memory concepts, arrays, strings, and user-defined data types like structures. Additionally, the course places a strong emphasis on practical software development skills, including program debugging, testing strategies, and code documentation.

The main objectives of the course are listed below:

- To introduce general problem-solving strategies, algorithm development techniques, and flowchart designing.
- To familiarize students with the fundamental structure of a C program, including tokens, data types, basic input/output, and operators.
- To develop logical thinking and structuring skills using decision-making statements and iterative execution of program code.
- To teach modular programming concepts by using functions, standard C libraries, and various storage classes.
- To enable students to organize and manipulate data effectively using one-dimensional and two-dimensional arrays, strings, and structures.
- To instill coding standards and best practices by focusing on debugging techniques, runtime error resolution, and code readability.

2. Course Outcomes (COs)

	COs	Program Outcomes (PO)
CO1	Comprehend the fundamentals of computational problem-solving and logic development to design algorithmic solutions.	PO1, PO2, PO3, PO5
CO2	Apply fundamental programming elements such as data types, variables, identifiers, and operators to construct and evaluate expressions.	PO1, PO3, PO4, PO5
CO3	Implement structured control flow, including decision-making and iterative constructs, to solve complex computational problems.	PO1, PO2, PO3, PO4, PO5, PO7, PO11
CO4	Apply modular programming principles by designing functions and managing variable scope and memory lifetimes.	PO3, PO4, PO5
CO5	Utilise single and multi-dimensional data structures to effectively store, organise, and retrieve collections of data.	PO4, PO5
CO6 (Only for lab component)	Integrate comprehensive programming concepts to develop, test, and debug software applications for real-world scenarios.	PO1, PO2, PO3, PO4, PO5, PO7, PO11

CO-PO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	No. of Lectures	NHEQF Level Descriptor
CO1	H	M	M		H							H	M	15	Q1, Q3, Q6
CO2	M		M	H	M							H	M	17	Q1, Q2
CO3	L	M	H	M	M		L				L	H	M	24	Q3, Q6
CO4			L	M	H							H	H	09	Q3
CO5				L	H							M	H	15	Q1, Q2
CO6	L	M	H	M	M		L				H	H	H	10	Q3, Q6
Total Contact Hours									90						

H=High, M=Medium, L=Low

3. Recommended Books/E-Resources (Textbooks and Reference books):

- B01: Kanetkar, Yashwant, "Let us C", New Delhi BPB Publication 2019. 17th Edition.
 B02: E. Balagurusamy, "Programming in ANSI C", McGraw Hill Education India, 2019, Edition-8
 B03: Reema Thareja, "Computer Fundamentals and Programming in C", Oxford University Press, 2016, 2nd Edition
 B04: Schildt, Herbert, "C: The Complete Reference", McGraw Hill Education (New Delhi), 2018, 4th Edition
 B05: Kernighan, Brian W. and Ritchie, Dennis M, "The C Programming Language", Pearson Education (New Delhi), 2007, 2nd Edition
 B06: E. Balagurusamy, "Fundamentals of Computers", McGraw Hill Education India, 2011, Edition-6
 B07: Reema Thareja, "Fundamentals of Computers", Oxford University Press, Edition-2
 B08: Steve McConnell, *Code Complete*, 2nd Edition, Microsoft Press.

E-Library Resource

Serial No	Link of Journals, Magazines, websites and Research Papers
1.	https://nptel.ac.in/courses/106106210
2.	https://www.coursera.org/specializations/c-programming
3.	https://www.coursera.org/learn/c-for-everyone
4.	https://ocw.mit.edu/courses/6-087-practical-programming-in-c-january-iap-2010/
5.	https://ocw.mit.edu/courses/6-s096-introduction-to-c-and-c-january-iap-2013/
6.	https://catalogue.library.cern/literature/t50vw-6at59

4. Recommended Tools and Platforms

GCC Compiler (GNU Compiler Collection), Code::Blocks IDE, Dev-C++, Visual Studio Code (with C/C++ extensions), Replit (C environment)

5. Delivery/Instructional Plan and Resources

Theory Plan:

Lect. No.	Topics	CO	Book No, CH No, Page No	TLM	Web References/Audio-Video
1-2	Problem Solving and Logic Development: Problem definition, Problem analysis, General problem-solving strategies, Algorithm design and characteristics, Algorithm development techniques	CO1	B06, CH 13, Page no 332-351	Lecture	https://onlinecourses-archive.nptel.ac.in/noc19_cs06/preview?

3-4	Flowcharts, Standard Flowchart Symbols, Flowchart Designing implementation, Pseudocode, Difference between Algorithm, Flowchart and Pseudocode, Structured vs Unstructured Programming, Computational Problem Solving.	CO1	B07, CH 7, Page no 332-351	Lecture	https://www.geeksforgeeks.org/dsa/introduction-to-algorithms/ https://www.geeksforgeeks.org/computer-science-fundamentals/what-is-a-flowchart-and-its-types/ https://www.geeksforgeeks.org/dsa/an-introduction-to-flowcharts/ https://youtu.be/5AHRXOtn9bY?si=H9ZAo8vd25C0ImRo https://youtu.be/O8vPR3zh5go?si=HoTzxKhWrWquTUF6 https://www.geeksforgeeks.org/dsa/what-is-pseudocode-a-complete-tutorial/
5	Introduction to C Programming: History and Features of C, Structure of a C Program, Compilation and Execution Process	CO1	B01, CH 1, pp. 1-9; B06, CH 1, pp. 1-15	Lecture	https://en.cppreference.com/w/c/preprocessor https://ocw.mit.edu/courses/6-087-practical-programming-in-c-january-iap-2010/resources/mit6_087iap10_lec01/ https://www.geeksforgeeks.org/c-language-introduction/ https://www.youtube.com/watch?v=vdyldXpA6ec&list=PLyqSpQzTE6M8O9Oy9t-yhiAUXOI-rmTp_&index=1 https://www.youtube.com/watch?v=SnzvWUFxcYU&list=PLyqSpQzTE6M8O9Oy9t-yhiAUXOI-rmTp_&index=2
6-7	Basic C Program Tokens, Keywords, Identifiers, Variables, Constants, Data Types (including pointers as data type), Basic Input and Output.	CO2	B01, CH 2, pp. 21-32; B03, CH 3, pp. 45-60	Lecture	https://en.cppreference.com/w/c/language/type https://www.geeksforgeeks.org/variables-in-c/ https://randu.org/tutorials/c/basic.php https://www.youtube.com/playlist?list=PL_c9BZzLwBRKKqOc9TJz1pP0ASrxLMtp2 https://nptel.ac.in/courses/106104128?utmhttps://youtu.be/TZ_FrgbHqGk?si=KGR8JT4alfQuUJys
8	Operators and Expressions: Arithmetic, Relational, Logical, Assignment, Unary, Increment/Decrement, Conditional.	CO2	B01, CH 2, pp. 32-40; B02, CH 4, pp. 65-80	Lecture	Lecture 2 Practical Programming in C Electrical Engineering and Computer Science MIT OpenCourseWare https://en.cppreference.com/w/cpp/language/expression_s.html https://www.learn-c.org/ https://randu.org/tutorials/c/basic.php Lecture 2 Practical Programming in C Electrical Engineering and Computer Science MIT OpenCourseWare
CAT1					
9	Type Conversion, Escape Sequences, Coding Standards and Best Programming Practices.	CO2	B01, CH 1, pp. 6-18; B02, CH 2, pp. 20-35	Lecture	https://www.programiz.com/c-programming/c-input-output https://en.cppreference.com/w/cpp/keywords.html https://www.learn-c.org/ https://www.youtube.com/playlist?list=PL_c9BZzLwBRKKqOc9TJz1pP0ASrxLMtp2 https://nptel.ac.in/courses/106104128?utm
10-11	Program Debugging, Testing and Documentation: Compilation Errors, Runtime Errors, Logical Errors, Debugging Techniques, Testing Strategies, Code Readability, Documentation, Code Optimization Basics.	CO1	B08, CH 8, Page no 205-208 B08, CH 1, Page no 3-7	Lecture	https://youtu.be/IdXrCPzNnkU?si=MEbnukysE3zatC5b https://ptgmedia.pearsoncmg.com/images/9780735619678/samplepages/9780735619678.pdf

12-13	C Program Organization: Modular Programming, Functions as Building Blocks, Header Files, Preprocessor Directives (#include, #define), Standard C Libraries (stdio.h, stdlib.h, string.h, math.h, ctype.h, time.h).	CO2	B01, CH 12, pp. 363-380; B04, CH 18, pp. 470-490	Lecture	https://youtu.be/IoT0zP4YIMk?si=ZfJhgurwVgYymuLL https://youtu.be/i4SXF4Ra-g?si=MVB5SGKx0XY3JfpH
14	Bitwise, sizeof Operator, Operator Precedence and Associativity, Expression Evaluation.	CO2	B01, CH 2, pp. 32-40; B02, CH 4, pp. 65-80	Lecture	Lecture 2 Practical Programming in C Electrical Engineering and Computer Science MIT OpenCourseWare https://en.cppreference.com/w/cpp/language/expression_s.html https://www.learn-c.org/ https://randu.org/tutorials/c/basic.php Lecture 2 Practical Programming in C Electrical Engineering and Computer Science MIT OpenCourseWare
15-16	Decision Making: if, if-else, Nested if, else-if Ladder, Switch Statement, Conditional Operator, Menu-driven Programming.	CO3	B01, CH 3-6, pp. 39-104; B02, CH 6-7, pp. 100-140	Lecture	Lecture 3 Practical Programming in C Electrical Engineering and Computer Science MIT OpenCourseWare https://en.cppreference.com/w/cpp/language/statements.html https://randu.org/tutorials/c/index.php https://nptel.ac.in/courses/106104128?utm https://www.youtube.com/playlist?list=PL_c9BZzLwBRKKqOc9TJz1pP0ASrXLmtp2
CAT2					
17-19	Iterative Statements: while, do-while, for loop, Nested Loops, Infinite Loops, break, continue, goto statement	CO3	B01, CH 3-6, pp. 39-104; B02, CH 6-7, pp. 100-140	Lecture	https://youtu.be/pU2Nvsa_9zc?si=zuf7VUBdoRuhOttI https://youtu.be/CBZQcJstwkM?si=uLpqrPPC11_W5Vff
20	Pattern Programming, Problem Solving using Iteration.	CO3	B01, CH 3, pp. 114-117	Lecture	https://www.geeksforgeeks.org/c/pattern-programs-in-c/
21-22	Functions: Function Definition, Declaration, Prototypes, Parameter Passing, Return Values, Scope of Variables, Local and Global Variables.	CO4	B01, CH 7, pp. 135-149; B02, CH 5, pp. 90-120	Lecture	https://youtu.be/AJvCmpt1UU8?si=peK8tReMvZOxM15y https://youtu.be/JenkXelhImM?si=Q18WGUI26D050d0r
23	Arrays: One-Dimensional Arrays, Searching, Basic Sorting.	CO5	B01, CH 13-14, pp. 239-274; B02, CH 8, pp. 150-175	Lecture	https://youtu.be/TXcz8FTulzY?si=Llv6sZc8eTvBXMBp https://ocw.mit.edu/courses/6-087-practical-programming-in-c-january-iap-2010/resources/mit6_087iap10_lec05/ https://ocw.mit.edu/courses/6-087-practical-programming-in-c-january-iap-2010/resources/mit6_087iap10_lec07/

CAT3					
24-25	Functions with Arrays, Two-Dimensional Arrays, Matrix Operations.	CO5	B01, CH 13-14, pp. 239-274; B02, CH 8, pp. 150-175	Lecture	https://youtu.be/TXcz8FTulzY?si=Liv6sZc8eTvBXMbP https://ocw.mit.edu/courses/6-087-practical-programming-in-c-january-iap-2010/resources/mit6_087iap10_lec05/ https://ocw.mit.edu/courses/6-087-practical-programming-in-c-january-iap-2010/resources/mit6_087iap10_lec07/
26	Storage Classes and Memory Concepts: auto, static, extern, register Storage Classes, Variable Lifetime and Scope.	CO4	B01, CH 10-11, pp. 173-198; B02, CH 10, pp. 220-240	Lecture	https://www.wscubetech.com/resources/c-programming/recursion https://www.youtube.com/playlist?list=PL_c9BZZLwBRKKqOc9TJz1pP0ASrXLMtp2
27-28	Structures and User-Defined Data Types: Structures, Nested Structures, Arrays of Structures, Structures with Functions, typedef.	CO5	B01, CH 16, pp. 334-342; B02, CH 11, pp. 250-270	Lecture	https://youtu.be/kDDd7AmXq1w?si=iz0PC28TR9yCi2r3 https://ocw.mit.edu/courses/6-087-practical-programming-in-c-january-iap-2010/resources/mit6_087iap10_lec06/
29-30	Strings: Character Arrays, String Input and Output.	CO5	B01, CH 15, pp. 296-310; B02, CH 9, pp. 180-200	Lecture	https://ocw.mit.edu/courses/6-087-practical-programming-in-c-january-iap-2010/resources/mit6_087iap10_lec05/ https://randu.org/tutorials/c/strings.php https://nptel.ac.in/courses/106104128?utm https://www.youtube.com/playlist?list=PL_c9BZZLwBRKKqOc9TJz1pP0ASrXLMtp2
CAT4,CAT5					

Lab Plan:

Lect. No.	Topics	CO	TLM	Web References/Audio-Video
1-2	Install C compiler (GCC/Code:Blocks), set up IDE, compile and run the first "Hello, World!" program. Understand program structure, preprocessors, and compilation flow.	CO1	Demonstration method using simulation tool	https://www.gnu.org/software/gcc/ https://www.codeblocks.org/downloads/ https://www.javatpoint.com/compile-run-c-program https://www.tutorialspoint.com/cprogramming/c_overview.htm https://www.geeksforgeeks.org/compiling-a-c-program-behind-the-scenes/ https://www.youtube.com/watch?v=GWJqsmitR2I https://www.youtube.com/watch?v=KJgsSFOSQv0 https://www.youtube.com/watch?v=8PopR3x-VMY
3 - 4	Write a simple C program to print "Hello, C!" on the screen. Include comments, experiment with main() function and basic syntax. Compile and run the program.	CO1	Demonstration method using simulation tool	C Examples Programiz C Programming Fun Programs - YouTube https://en.cppreference.com/w/c/preprocessor https://ocw.mit.edu/courses/6-087-practical-programming-in-c-january-iap-2010/resources/mit6_087iap10_lec01/ https://www.geeksforgeeks.org/c-language-introduction/

5-6	Write a program using macros and preprocessor directives. Use #define to create constants and include stdio.h. Demonstrate the effect of comments in your code.	CO1	Demonstration method using simulation tool	<u>C Examples Programiz</u> <u>C Programming Fun Programs - YouTube</u> https://en.cppreference.com/w/c/preprocessor https://ocw.mit.edu/courses/6-087-practical-programming-in-c-january-iap-2010/resources/mit6_087iap10_lec01/ https://www.geeksforgeeks.org/c-language-introduction/
7-8	Write a C program to take user input of name, age, and marks in three subjects. Print the details in a formatted way.	CO1	Demonstration method using simulation tool	<u>C Examples Programiz</u> <u>C Programming Fun Programs - YouTube</u> https://www.programiz.com/c-programming/c-input-output https://en.cppreference.com/w/cpp/keywords.html https://www.learn-c.org/ https://www.youtube.com/playlist?list=PLc9BZzLwBRKKqOc9TJz1pP0ASrxLMtp2 https://nptel.ac.in/courses/106104128?utm
9-10	Declare variables of different types (int, float, char) and constants. Assign values and print them. Experiment with naming conventions and scope.	CO2	Demonstration method using simulation tool	https://en.cppreference.com/w/c/language/type https://www.geeksforgeeks.org/variables-in-c/ https://randu.org/tutorials/c/basic.php <u>C Examples Programiz</u> <u>C Programming Fun Programs - YouTube</u>
11-12	Write a program to demonstrate different data types and type modifiers. Print sizes using sizeof() and perform sample arithmetic operations.	CO2	Demonstration method using simulation tool	<u>C Examples Programiz</u> <u>C Programming Fun Programs - YouTube</u>
13-14	Implement a program to perform arithmetic, relational, logical, assignment, increment/decrement, and bitwise operations. Display results clearly.	CO2	Demonstration method using simulation tool	<u>C Examples Programiz</u> <u>C Programming Fun Programs - YouTube</u> https://nptel.ac.in/courses/106104128?utm https://www.youtube.com/playlist?list=PLc9BZzLwBRKKqOc9TJz1pP0ASrxLMtp2
15-16	Write a program using ternary operator to find the maximum of three numbers. Perform type casting between int, float, and char types.	CO2	Demonstration method using simulation tool	<u>C Examples Programiz</u> Lecture 2 Practical Programming in C Electrical Engineering and Computer Science MIT OpenCourseWare <u>C Programming Fun Programs - YouTube</u> https://nptel.ac.in/courses/106104128?utm https://www.youtube.com/playlist?list=PLc9BZzLwBRKKqOc9TJz1pP0ASrxLMtp2
17-18	Write a program to evaluate each of the following equations. (i) $V = u + at$. (ii) $S = ut + \frac{1}{2}at^2$ (iii) $T = 2\sqrt{a + \sqrt{b + 9c}}$ (iv) $H = \sqrt{b^2 + p^2}$	CO2	Demonstration method using simulation tool	<u>C Examples Programiz</u> <u>C Programming Fun Programs - YouTube</u>

19-20	Create a program that calculates grades based on marks using if-else and else-if ladder. Implement a switch-case for displaying grade remarks.	CO3	Demonstration method using simulation tool	<u>C Examples Programiz</u> <u>C Programming Fun Programs - YouTube</u> https://www.geeksforgeeks.org/decision-making-c-cpp/ https://www.javatpoint.com/c-if-else https://www.programiz.com/c-programming/c-for-loop https://www.tutorialspoint.com/cprogramming/c_loops.htm https://www.youtube.com/watch?v=eZ14U11KqkI&list=PLm8dSOaqLPHI65eHiBKtNrBgV47hGbOaM&index=9&pp=iAQ https://www.youtube.com/watch?v=B9pox16p9To&list=PLm8dSOaqLPHI65eHiBKtNrBgV47hGbOaM&index=11
21-22	Create a program using while loop to print the sum of first n natural numbers.	CO3	Demonstration method using simulation tool	<u>C Examples Programiz</u> <u>C Programming Fun Programs - YouTube</u> https://www.youtube.com/watch?v=eZ14U11KqkI&list=PLm8dSOaqLPHI65eHiBKtNrBgV47hGbOaM&index=9&pp=iAQ https://www.youtube.com/watch?v=B9pox16p9To&list=PLm8dSOaqLPHI65eHiBKtNrBgV47hGbOaM&index=11
23-24	Create a program to check a number is Armstrong or not using for loop.	CO3	Demonstration method using simulation tool	<u>C Examples Programiz</u> <u>C Programming Fun Programs - YouTube</u> https://www.youtube.com/watch?v=eZ14U11KqkI&list=PLm8dSOaqLPHI65eHiBKtNrBgV47hGbOaM&index=9&pp=iAQ https://www.youtube.com/watch?v=B9pox16p9To&list=PLm8dSOaqLPHI65eHiBKtNrBgV47hGbOaM&index=11
25-26	Create a program to count the digits in a number and then print the reverse of the number also.	CO3	Demonstration method using simulation tool	<u>C Examples Programiz</u> <u>C Programming Fun Programs - YouTube</u>
27-28	Implement a program to generate the Fibonacci series.	CO3	Demonstration method using simulation tool	<u>C Examples Programiz</u> <u>C Programming Fun Programs - YouTube</u>
29-30	Write the following programs using switch case statement: (i) To check that an input alphabet is vowel or consonant (ii) To check whether a number is positive, negative or zero	CO3	Demonstration method using simulation tool	<u>C Examples Programiz</u> <u>C Programming Fun Programs - YouTube</u>
31-32	Write a program to print the following patterns: a) * ** *** **** ***** ***** b) * ** *** **** ***** *****	CO3	Demonstration method using simulation tool	<u>C Examples Programiz</u> <u>C Programming Fun Programs - YouTube</u> https://www.programiz.com/c-programming/examples/pyramid-pattern

33-34	Write the program to print the following pattern: 1 2 3 4 5 6 2 4 6 8 10 12 3 6 9 12 15 18 4 8 12 16 20 24 5 10 15 20 25 30 6 12 18 24 30 36	CO3	Demonstration method using simulation tool	C Examples Programiz C Programming Fun Programs - YouTube https://www.programiz.com/c-programming/examples/pyramid-pattern
35-36	Write programs for: (a) printing first 10 Fibonacci numbers, (b) sum of even numbers till N, (c) use break/continue/goto in a loop.	CO3	Demonstration method using simulation tool	C Examples Programiz C Programming Fun Programs - YouTube
37-38	Write program to Display Prime Numbers Between Intervals Using Function.	CO4	Demonstration method using simulation tool	C Examples Programiz C Programming Fun Programs - YouTube
39-40	Write user-defined functions for (a) calculating factorial, (b) checking prime number, and (c) swapping two numbers.	CO4	Demonstration method using simulation tool	C Examples Programiz C Programming Fun Programs - YouTube
41-42	Experiment with auto, static, register, and extern variables.	CO4	Demonstration method using simulation tool	C Examples Programiz C Programming Fun Programs - YouTube
43-44	Create a program to store marks of students in an array, calculate total, average, and find highest/lowest marks. Also implement a 2D array for matrix addition.	CO5	Demonstration method using simulation tool	C Examples Programiz C Programming Fun Programs - YouTube https://youtu.be/kFGoxwThL4k?si=8y6kj7m80IgbseZW
45-46	Practice while an array of integers is given, find all duplicates in the array.	CO5	Demonstration method using simulation tool	C Examples Programiz C Programming Fun Programs - YouTube
47-48	Create a program to Multiply Two Matrices Using Multi-Dimensional Arrays	CO5	Demonstration method using simulation tool	C Examples Programiz C Programming Fun Programs - YouTube
49-50	Use array concept to find transpose of a Matrix	CO5	Demonstration method using simulation tool	C Examples Programiz C Programming Fun Programs - YouTube
51-52	Implement a structure for student details. Store multiple students in an array. and display their information.	CO6	Demonstration method using simulation tool	C Examples Programiz C Programming Fun Programs - YouTube
53-54	Create a program to add two distances in inch & feet using the concept of structures.	CO6	Demonstration method using simulation tool	C Examples Programiz C Programming Fun Programs - YouTube
55-56	Create a program to add two complex numbers using the concept of structures in C.	CO6	Demonstration method using simulation tool	C Examples Programiz C Programming Fun Programs - YouTube
57-58	Implement in C to store the information of five employees using both concepts i.e. array of structure and array within structure.	CO6	Demonstration method using simulation tool	C Examples Programiz C Programming Fun Programs - YouTube
59-60	Write a menu driven program to show the use of in-built string functions like strlen, strcat, strcpy, strcmp, strcmp etc.	CO6	Demonstration method using simulation tool	C Examples Programiz C Programming Fun Programs - YouTube

6. Course ERISE Mapping: Employability

7. Active Learning Methodology Used

Active Learning Methodology Used	Elaboration
1. Think-Pair-Share Topic: Problem Solving, Algorithms & Flowcharts	Students individually analysed a real-world problem, designed an algorithm, and prepared a flowchart. They then discussed their solutions in pairs before presenting them to the class. The activity encouraged logical thinking, collaborative learning, and comparison of multiple solution approaches while strengthening problem-solving skills.
2. Pair Programming Topic: Introduction to C Programming & Operators	Students worked in pairs, with one student writing the code (driver) and the other reviewing and suggesting improvements (navigator). They developed simple C programs using variables, operators, input/output, and type conversion. Roles were swapped periodically to ensure equal participation and improve coding accuracy.
3. Debugging Challenge Topic: Program Debugging, Testing & Documentation	Students were provided with C programs containing syntax, runtime, and logical errors. Working in small groups, they identified, corrected, tested, and documented the errors. The activity enhanced debugging skills, analytical thinking, and understanding of software testing practices.
4. Case-Based Learning Topic: Decision Making & Iterative Statements	Real-life scenarios such as ATM transactions, grading systems, and menu-driven applications were discussed. Students identified suitable decision-making and looping constructs, developed algorithms, and implemented C programs. The activity promoted application-based learning and improved programming logic.

8. Action plan for different types of learners

Learners with constant monitoring Type-I	Average Learners Type- II	Fast Learners Type- III
Remedial Classes, Doubt Sessions, Guided Tutorials	Workshop, Doubt Session, E-notes and E-exercises to read ahead of the pedagogic material.	Coding Competitions, Project

9. Additional Self-directed Learning

Assignments to promote self-learning, survey of contents from multiple sources.

S.No	Advanced Topics, Additional Reading, Research papers and any	CO	ALM	References/MOOCs
1.	Data types in C, Basic input/ output functions.	CO1, CO2	Think – Pair- Share, Peer Review	https://nptel.ac.in/courses/106106210 https://www.coursera.org/learn/c-for-everyone https://ocw.mit.edu/courses/6-087-practical-programming-in-c-january-iap-2010/pages/calendar/
2.	Conditional Statements, Iterations and Functions	CO3, CO4	Think – Pair- Share, Brain Storming sessions	https://nptel.ac.in/courses/106106210 https://www.coursera.org/learn/c-for-everyone

10. Evaluation Scheme & Components:

Assessment Type	Evaluation Component	No. of Assessments	Type of Component	Component Description	% Weightage of Component	Max. Marks	Mode of Assessment	CO
Formative	Component1	01	Continuous Assessment(CA)	CAT1	25%	25	Online	CO1,CO2
Formative	Component2	01	Continuous Assessment(CA)	CAT2	25%	25	Online	CO2,CO3
Formative	Component3	01	Continuous Assessment(CA)	CAT3	25%	25	Online	CO3,CO4, CO5



Formative	Component4	01	Continuous Assessment(CA)	CAT4	25%	25	Online	CO1-CO6
Formative	Component5	01	Continuous Assessment(CA)	CAT5	25%	25	Online	CO1-CO6
			Total	100%				

Note:

- The academic performance for each subject is evaluated across five Continuous Assessments (CA1 through CA5).
- Best-of-Four Policy: The final score will be calculated based on the best four scores out of the five assessments.
- Mandatory Requirement: Students must appear in at least one of CA4 or CA5. Failure to appear in both CA4 and CA5 will result in an Incomplete (I) grade being awarded for the respective subject.
- Passing Threshold: Students must secure a minimum aggregate of 50% marks to pass a subject. Scoring below 50% will result in a Fail grade ('F').

11. Sessional Test-Wise Syllabus of the Course:

Evaluation Component	Description	Syllabus Covered	Weightage %
Component1	CAT1	Lecture (1-8)	25%
Component2	CAT2	Lecture (9-16)	25%
Component3	CAT3	Lecture (17-23)	25%
Component4	CAT4	Lecture (1-30)	25%
Component5	CAT5	Lecture (1-30)	25%

This Document is approved by:

Designation	Name	Signature with date
Prepared by Course Coordinator	Dr. Gaganpreet Kaur	<i>Gaganpreet Kaur</i> 2/9/2026
Verified by Program Incharge	Dr. Preetinder Singh Brar	<i>Preetinder Singh Brar</i>
Approved by Pro Vice Chancellor	Dr. Jaiteg Singh	<i>Jaiteg Singh</i>
Date(DD/MM/YYYY)	27/08/2026	