Semester: I			
Course Title	Programming in C	**CIE Marks**	50
Course Code	BCSPSC115	**SEE Marks**	50
Course Type	Theory	**Total Marks**	100
Course Category	PSC	**SEE Duration**	03 hrs
Hours Per Week	2L: 2T: 0P	**SEE Type**	Written
Total Hours	40 hrs	**Credits**	03

Course Learning Objectives
This course will enable the students to
• Utilize control structures and operators to implement logical solutions.
• Construct programs using functions and derived data types to implement modular solutions.
• Analyze and choose suitable C constructs to solve context-specific real-world tasks.

Module 1	**8 hrs**
Introduction to Computing: Computer languages, Creating and Running Programs, System Development. **Overview of C:** A Brief History of C, C Is a Middle-Level Language, C Is a Structured Language, C Is a Programmer's Language, Compilers Vs. Interpreters, The Form of a C Program, The Library and Linking, Separate Compilation, Compiling a C Program, C's Memory Map. **Expressions:** The Basic Data Types, Modifying the Basic Types, Identifier Names, Variables, The Four C Scopes, Type Qualifiers, Storage Class Specifiers, Variable Initializations, Constants, Operators, Expressions. **Textbook 2: Chapter 1: 1.3, 1.4, 1.5; Textbook 1: Chapter 1, 2**	
Module 2	**8 hrs**
Console I/O: Reading and Writing Characters, Reading and Writing Strings, Formatted Console I/O, printf(), scanf(). **Statements:** True and False in C, Selection Statements, Iteration Statements, Jump Statements, Expression Statements, Block Statements. **Textbook 1: Chapter 8, 3**	
Module 3	**8 hrs**
Arrays and Strings: Single-Dimension Arrays, Generating a Pointer to an Array, Passing Single-Dimension Arrays to Functions, Strings, Two-Dimensional Arrays, Multidimensional Arrays, Array Initialization, Variable -Length Arrays. **Sorting and Searching:** The Bubble sort, Sequential search, Binary search **Pointers:** What Are Pointers? Pointer Variables, The Pointer Operators, Pointer Expressions, Pointers and Arrays, Multiple Indirection, Initializing Pointers. **Textbook 1: Chapter 4, 5, 21**	
Module 4	**8 hrs**
Functions: The General Form of a Function, Understanding the Scope of a Function, Function Arguments, argc and argv—Arguments to main(), The return Statement, What Does main() Return?, Recursion, Function Prototypes, Declaring Variable Length Parameter Declarations. **Pointers (Contd…):** Pointers to Functions, C's Dynamic Allocation Functions. **Textbook 1: Chapter 5, Chapter 6**	

Module 5	8 hrs
Structures, Unions, Enumerations, and typedef: Structures, Arrays of Structures, Passing Structure to Functions, Structure Pointers, Arrays and Structures within Structures, Unions, Bit-Fields, Enumerations, Using sizeof to Ensure Portability, typedef. **Textbook 1: Chapter 7**	

Text Books:	
1	Schildt, Herbert. "C the complete reference", 4th Edition, Mc Graw Hill.
2	Hassan Afyouni, Behrouz A. Forouzan. “A Structured Programming Approach in C”, 4th Edition, Cengage.
Reference Books:	
1	Brian W. Kernighan and Dennis M. Ritchie, The ‘C’ Programming Language, 2nd Edition, Prentice Hall of India
2	Reema Thareja, Programming in C, 3rd Edition, Oxford University Press, 2023.

Course Outcome Statements: After the successful completion of the course, the student will be able to	
CO1	Demonstrate fundamental concepts and language constructs of C programming.
CO2	Make use of control structures and arrays to solve basic computational problems.
CO3	Illustrate user-defined data structures such as Arrays in implementing solutions to searching and sorting methods.
CO4	Make use of strings, structures, unions and pointers to solve a realistic problem.
CO5	Design and develop a solution to a problem using modular programming constructs.

Course Articulation Matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO11	PSO12
CO1	2	2									2	2	2
CO2	2	2	2	2				2	2		2	2	2
CO3	2	2	1	2				2	1		2	2	2
CO4	2	2	2	2				2	2		2	2	2
CO5	2	2	2	2				2	1		2	2	2
Avg.	**2**	**2**	**1.75**	**2**				**2**	**1.5**		**2**	**2**	**2**

3: High, 2: Medium, 1: Low