HCS-C101	PROBLEM SOLVING USING C PROGRAMMING	L	T	P	C
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Prerequisite: NIL

Course Objectives:

1. To provide complete knowledge of C language.
2. Students will be able to develop logics which will help them to create programs, applications in C.
3. By learning the basic programming constructs they can easily switch over to any other language in future

Course Outcomes:

CO1. To develop C programs using operators

CO2. Develop conditional and iterative statements to write C programs

CO3. Inscribe C programs that use arrays, strings and pointer.

CO4. Exercise user defined functions to solve real time problems

CO5. Exercise user defined data types including structures and unions to solve problems

CO6. Exercise files concept to show input and output of files in

Overview of C: History and importance of C, Basic structure of C program, executing a C program.

Constants, Variable and Data Types: Introduction, Character Set, C Tokens, Keywords and Identifiers, Constants, Variables, Data Types, Declaration of Variables, Assigning Values to Variables, Defining Symbolic Constants.

Managing Input and Output Operations: Reading a Character, Writing a Character, Formatted Input, Formatted Output.

Operators and Expressions: Introduction, Arithmetic Operators, Relational Operators, Logical Operators, Assignment Operators, Increment and Decrement Operators, Conditional Operator, Bitwise Operators, Special Operators, Arithmetic Expressions, Evaluation of Expressions, Precedence of Arithmetic Operators, Type Conversions in Expressions, Operator Precedence and Associativity.

Decision Making and Branching: Introduction, Decision Making with IF Statement, Simple IF Statement, the IF-ELSE Statement, Nesting of IF-ELSE Statements, The ELSE IF Ladder, The Switch statement, The ? : Operator, The goto statement.

Decision Making and Looping: Introduction, while Statement, do statement, for statement, Jumps in LOOPS.

Arrays: One-dimensional Arrays, Declaration of One-dimensional Arrays, Initialization of One-dimensional Arrays, Two-dimensional Arrays, Declaration of Two-dimensional Arrays, Initialization of Two-dimensional Arrays.

Character Arrays and Strings: Declaring and Initializing String Variables, Reading Strings from Terminal, Writing Strings to Screen, Arithmetic Operations on Characters, String-handling Functions, Example Programs (with and without using built-in string functions)

User-defined Functions: Need for functions, Elements of User-defined Functions, Definition of Functions, Return Values and their Types, Function Calls, Function Declaration, Category of Functions, No Arguments and no Return Values, Arguments but no Return values, Arguments with Return Values, No Arguments but Returns a Value, Passing Arrays to Functions, Recursion, The Scope, Visibility and Lifetime of variables.

Pointers: Introduction, Declaring Pointer Variables, Initialization of Pointer variables, accessing a Variable through its Pointer, Pointer Expressions, Pointer Increments and Scale Factor.

Structures: Introduction, Defining a structure, declaring structure variables, accessing structure members, structure initialization, array of structures.

File Management in C: Introduction, Defining and opening a file, closing a file, Input/output and Error Handling on Files.

Recommended Books:

1. E. Balaguruswamy, "Programming in ANSI C", 8th Edition, 2019, McGraw Hill Education, ISBN: 978-93-5316-513-0.
2. Brian W. Kernighan, Dennis M. Ritchie, The C Programming Language, Prentice Hall
3. K.N. King, C Programming: A Modern Approach, W W Norton & Company, Inc

HCS-C151	C PROGRAMMING LAB	L	T	P	C
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Prerequisite: NIL

Lab Objectives:

1. To introduce students to the basic knowledge of programming fundamentals of C language.
2. To impart writing skill of C programming to the students and solving problems.
3. To impart the concepts like looping, array, functions, pointers, file, structure.

Lab outcomes:

LO1. Know the steps involved in compiling, linking and debugging C code.

LO2. Understand the logic for a given problem and implement the logic using C program.

LO3. Learn the methods of iteration or looping and branching.

LO4. Make use of different data-structures like arrays, pointers, structures and files.

LO5. Understand how to access and use library functions.

List of Experiments:

1. Sequence constructs.
2. Iterative construct.
3. Nested for loops.
4. Functions
5. Recursive functions.
6. One dimensional and two-dimensional arrays.
7. Pointers and functions.
8. Pointers and Arrays.
9. Structure and Union.
10. File Processing.