

# 2022-23

## CERTIFICATE IN C PROGRAMING



GURUKUL  
EDUCATIONAL AND  
RESEARCH INSTITUTE

Subject and Syllabus

# **CERTIFICATE IN C PROGRAMING**

**DURATION:- 6 MONTHS**

## **504 INTRODUCTION TO C PROGRAMMING**

**Introduction to Computing:** Introduction, Art of Programming through Algorithms and Flowcharts

**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

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## **505 CONTROL STRUCTURES**

**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, The while Statement, The do statement, The for statement, Jumps in LOOPS.

## **506 INTRODUCTION TO ARRAYS AND STRINGS**

**Arrays:** One-dimensional Arrays, Declaration of One-dimensional Arrays, Initialization of One-dimensional Arrays, Example programs- Bubble sort, Selection sort, Linear search, Binary search, Two-dimensional Arrays, Declaration of Two-dimensional Arrays, Initialization of Two-dimensional Arrays, Example programs-Matrix Multiplication, Transpose of a matrix.

**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)

## **507 FUNCTIONS AND INTRODUCTION TO POINTERS**

**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.

## **508 STRUCTURES AND FILE MANAGEMENT**

**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.