Curriculum for Class X

Annual Plan

Objective:

To introduce students to **fundamental programming concepts in C++**, covering **basic syntax, control structures, functions, and arrays & strings** to develop problem-solving skills.

Expected Learning Outcomes:

- **Understanding Core Programming Concepts** in C++
- Ability to **write, debug & execute C++ programs**
- Strong foundation in arrays & strings for data handling
- Ability to solve real-world problems using functions & modular programming

Term 1: Fundamentals of C++ Programming

April - May: Introduction to C++ & Basic Syntax

- Overview of Programming & Introduction to C++
- History & Features of C++
- Setting up the Development Environment (Turbo C++)
- Structure of a C++ Program
- Writing, Compiling & Executing a Simple C++ Program
- Comments in C++ (// Single-line, /* Multi-line */)

June: Data Types, Variables & Operators

- Variables & Constants (int, float, char, double, bool)
- Input & Output in C++ (cin, cout)
- Operators in C++
    - Arithmetic Operators (+, -, *, /, %)
    - Relational Operators (==, !=, <, >, <=, >=)
    - Logical Operators (&&, ||, !)
    - Assignment Operators (=, +=, -=, *=, /=, %=)

July: Control Flow - Conditional Statements

- If-Else Statements
- Nested If-Else
- Switch Case Statement
- Ternary Operator (? :)

- **Practice Exercises:**
  - Check if a number is even or odd
  - Find the largest among three numbers
  - Simple calculator using switch-case

August: Control Flow - Loops

- **For Loop**
- **While Loop**
- **Do-While Loop**
- **Break & Continue Statements**
- **Practice Exercises:**
  - Printing number patterns
  - Sum of digits of a number
  - Factorial of a number using loops

September: Functions & Modular Programming

- **Introduction to Functions**
- **Function Prototypes & Definitions**
- **Call by Value vs Call by Reference**
- **Recursion in C++**
- **Practice Exercises:**
  - Finding Fibonacci series using recursion
  - Greatest Common Divisor (GCD) using functions

Assessment & Evaluation

- **Periodic Tests** (MCQs, Coding Exercises)

Term 2: Arrays & Strings

October: Introduction to Arrays

- **Understanding Arrays**
- **Declaring & Initializing 1D Arrays**
- **Accessing and Modifying Array Elements**
- **Practice Exercises:**
  - Find the largest and smallest element in an array
  - Calculate the sum and average of elements in an array

November: Multi-Dimensional Arrays

- **Understanding 2D Arrays**
- **Row-wise & Column-wise Operations**
- **Matrix Operations (Addition, Multiplication)**

- **Practice Exercises:**
  - Find the transpose of a matrix
  - Compute sum of diagonal elements of a matrix

December: Introduction to Strings

- **Character Arrays (char array[])**
- **String Handling using C++ string class**
- **Basic String Operations (strlen, strcpy, strcat, strcmp)**
- **Practice Exercises:**
  - Convert a string to uppercase & lowercase
  - Count the number of vowels and consonants in a string

January: Advanced String Manipulations

- **String Input & Output (cin.getline, getline(cin, str))**
- **Reversing a String**
- **Checking for Palindromes**
- **Practice Exercises:**
  - Reverse a given string
  - Check if a string is a palindrome

Assessment & Evaluation

- **Periodic Tests** (MCQs, Coding Exercises)