

C++

Fundamentals

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About Your Instructor

- Expert in C++ programming & systems development
- Flutter application & backend developer
- Creator of the C++ Fundamentals course on cystech1.com
- Solve more than 320 problems on website like Codeforces, LeetCode, HackerRank
- IEEE Extreme 17.0 Participant

Course Overview

8 Modules

From variables to strings — every core C++ concept covered step by step

6 Projects

Real-world mini projects to build your portfolio

~30 Hours

Complete course designed for beginners with zero prior experience

Beginner Level

No prior programming knowledge required to start

Platform

Access all content at cystech1.com

Course Roadmap

8 Modules · · 6 Mini Projects



MODULE 1

Introduction to Programming

01

• Getting Started

What is Programming?

A set of instructions given to a computer to perform tasks. Programming solves real-world problems through logic.

What is C++?

A powerful, fast, general-purpose language. Used in games, operating systems, embedded systems & high-performance apps.

Setup Environment

Install VS Code + g++ compiler. Write, compile and run C++ programs from your terminal or IDE.

First Program

Write your first Hello World program using the cout statement and understand the main() function structure.

Your First C++ Program

Hello World — the traditional first program in any language

```
#include <iostream>
using namespace std;

int main() {
    // Print to the screen
    cout << "Hello, World!" << endl;

    // Read input from user
    int age;
    cout << "Enter your age: ";
    cin >> age;
    cout << "You are " << age
         << " years old." << endl;

    return 0;
}
```

#include

Import the iostream library for input/output

int main()

Entry point of every C++ program

cout <<

Output (print) to the screen

cin >>

Input (read) from the keyboard

return 0

Program finished successfully

• Variables & Data Types

int

Integer numbers

1,2,3.....
-4,-5,0
39

float

Decimal numbers
~7 digits precision

:0.33, 1.447
4343.4
1000.0
-33.3
0.0

double

High precision decimal
~15 digits precision

1233.443543543
32.30000 ,23.443
-100.00

char

Single character

'A', 'z', '5'
'\$', '!', '~', '^', 'd', '@',

bool

True or False
1 or 0

string

Text sequence

"Hello World"
"ddd", "fadd", "ee+rer", "1", "434",
"3+33", "21.5556"

Variables, Constants & Comments

```
// Variable Declaration & Initialization
int age = 20;
float gpa = 3.9;
double pi = 3.14159265;
char grade = 'A';
bool isPass = true;
string name = "Ahmad";

// Constants – value cannot change
const int MAX_SCORE = 100;
const double TAX_RATE = 0.15;

// Comments
// This is a single-line comment

/* This is a
   multi-line comment */

// Multiple assignment
int x = 5, y = 10, z = 15;
```

Best Practices

- Variable names are case-sensitive
- Names must start with letter or _
- Use const for values that never change
- Always initialize variables before use
- Use meaningful, descriptive names