

C++ Programming Essentials



Overview

This course provides a swift and fundamental dive into the C++ language led by industry experts. You'll immerse yourself in hands-on exercises to become familiar with language syntax and gain insights into what defines a proficient C++ programmer. Learn from their experiences to avoid common pitfalls and develop the mindset to tackle challenging tasks confidently.

Length: 3 Days

Software: Visual Studio
Community 2022

ENROLL NOW

Course Objectives

After completing this course, you will:

- Have every tool needed to solve your programming problems.
- Be able to optimize algorithms.
- Gain a solid understanding of Object-Oriented Programming.
- Be able to debug and analyze your code.

Target Audience

This course is designed for engineers, new programmers, and anyone curious about C++ and programming in general. It starts from the basics and incrementally builds upon them. Through hands-on practice each day, you'll solidify your newly acquired techniques.

Prerequisites

Basic programming knowledge is essential, and C experience will help you understand C++-specific constructs easily.

Teaching Methodology

- Instructional strategies include lectures, discussions, demonstrations, and workshop-based learning which are used to convey information, facilitate learning, and promote understanding.
- Learning activities include exercises and projects designed to engage students in the learning process actively.

Course Outlines

DAY 1

Introduction

- ◊ C++ History and 98, ... 26 std

Basic Concepts

- ◊ Writing your first C++ Program, Getting to Know the Console
- ◊ Variables, Statements, Decision-making, Loops, and Functions Control Flow

Class

- ◊ Abstraction in C++
 - C-style Strings
 - std::string
- ◊ Constructors and Destructors
- ◊ Data Members and Member Functions
- ◊ Static in Functions and Classes

Setup Testing in VS2022

Workshop

- ◊ 125. Valid Palindrome
- ◊ 242. Valid Anagram
- ◊ 191. Number of 1 Bits
- ◊ 190. Reverse Bits
- ◊ 7. Reverse Integer

DAY 2

Templates

- ◊ std::array vs C-Style Array

Pointers and References

- ◊ Common Mistakes
- ◊ Unique and Shared Ownership

Classes Deeper Look

- ◊ Inheritance and Polymorphism
- ◊ Move Semantics and Swap
- ◊ Friend Classes and Functions
- ◊ Operator Overloading
- ◊ Casts

Exceptions

Workshop

- ◊ 1. Two Sum
- ◊ 36. Valid Sudoku
- ◊ 11. Container With Most Water
- ◊ 206. Reverse Linked List
- ◊ 21. Merge Two Sorted Lists

DAY 3

STD Library

- ◊ Lambda Expressions
- ◊ Containers
- ◊ Iterators
- ◊ Algorithms
- ◊ Files, Input and Output Streams

Debugging Techniques

- ◊ Sanitizers
 - Memory Leaks and Undefined Behavior

Workshop

- ◊ Making Tic Tac Toe
 - Featuring FTXUI