Introduction to C++

Training Course Overview

Clear Programming Paradigm LLC

Professional C++ Training

For Industry and Academic Institutions

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Overview

The five-day C++ training course is an introduction to the C++ programming language, the C++ Standard Library, and modern C++11 to C++17 standards. The training is offered both remotely and on-site.

The course is for teams who want to learn the C++ programming language, the C++ Standard Library, and modern C++ standards. No prior experience with C++ is required to attend the course, and the recommended group size should not exceed ten people.

The training day includes a theoretical introduction, live coding, source code examples, and coding exercises. The fifth is reserved for creating a C++ project, debugging the code, and doing code review sessions.

Topics

The following is a breakdown of all the C++ topics by day:

Day 1

- Introduction
- Compilers
- Types
- Declaration, Definition, and Initialization
- Operators, Operands, Expressions
- Standard Input
- Arrays
- Pointers
- References
- Strings
- Automatic Type Deduction
- Built-in Statements
- Constants
- Functions
- Scope and Lifetime
- Q&A and Exercises

Day 2

- Classes
  - Data Member Fields
  - Member Functions
  - Access Specifiers
  - Constructors
  - Default Constructor
  - Member Initialization
  - Copy Constructor
  - Copy Assignment
  - Move Constructor
  - Move Assignment
  - Operator Overloading
  - Destructors
  - Inheritance and Polymorphism
- Templates
- Enumerations
- Code Organization
  - Header and Source Files
  - Header Guards
  - Namespaces
- Q&A and Exercises

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Day 3

- Conversions
- Exceptions
- I/O Streams
- C++ Standard Library
  - Containers
    - std::vector
    - std::array
    - std::set
    - std::map
    - std::pair
    - Other Containers
  - The Range-Based for Loop
  - Iterators
  - Algorithms and Utilities
    - std::sort
    - std::find
    - std::copy
    - Min and Max Elements
    - Other Functions
- Lambda Expressions
- Q&A and Exercises

Day 4

- C++11 Standard
  - Automatic Type Deduction
  - Range-based Loops
  - Initializer Lists
  - Move Semantics
  - Lambda Expressions
  - The constexpr Specifier
  - Scoped Enumerators
  - Smart Pointers
  - std::tuple
  - static_assert
  - Introduction to Concurrency
  - Deleted and Defaulted Functions
  - Type Aliases
- C++14 Standard
  - Binary Literals
  - Digits Separators
  - Auto for Functions
  - Generic Lambdas
  - std::make_unique
- C++17 Standard
  - Nested Namespaces
  - Constexpr Lambdas
  - Structured Bindings
  - std::filesystem
  - std::string_view
  - std::any
  - std::variant
- Q&A and Exercises

Day 5

- Project
- Q&A and Code Review

On the fifth day, trainees create a project and participate in debugging and code review sessions.

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Workflow

A training day can be organized as follows:

Time	Activity
09:00 – 10:00	Live Training
10:00 – 10:45	Exercises
10:45 – 11:00	Coffee Break
11:00 – 11:45	Live Training
11:45 – 12:30	Exercises
12:30 – 13:30	Lunch Break
13:30 – 14:30	Live Training
14:30 – 15:15	Exercises
15:15 – 15:30	Coffee Break
15:30 – 16:15	Live Training
16:15 – 17:00	Exercises and Summary

Live Training includes:

1. Theoretical introduction
2. Practical live coding sessions on Windows, macOS, and Linux
3. Source code examples
4. PDF handouts
5. Q&A sessions with a trainer

Exercises include:

1. C++ source code tasks that increase in complexity
2. Complete C++ source code solutions
3. Q&A sessions with a trainer

Summary

The course provides a professional-grade introduction to the modern C++ programming language and reduces the time needed to learn the C++ programming language. The course follows the latest trends and guidelines and provides the necessary building blocks that make a C++ knowledge backbone. We can customize the training to the client's requirements. In our C++ training, we use Windows, macOS, and Linux machines.

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About Us

We are *Clear Programming Paradigm LLC*, a European IT consultancy company from Belgrade, Serbia. We provide professional C and C++ training services for industry and academic institutions.

We help shorten the time needed to learn the C++ programming language, increase productivity, and get your team up to date on the latest C++ standards.

Trainer

Slobodan Dmitrovic is a professional C++ trainer, consultant, and author of several programming books. He is an experienced C++ trainer for the automotive, semiconductor, and automation industries.

Slobodan also holds C++ training courses at several universities and institutes.

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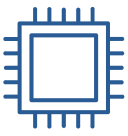
Thank you for taking the time to read our brochure.



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