C++ Essentials 1

Course Overview

This beginner course introduces the basics of programming in the C++ language and the fundamental notions and techniques used in object-oriented programming.

Benefits

Learning to program in C++ will enhance your students critical thinking and logic skills. The C++ language provides a balanced mix of high-level and low-level language features. As a result, your students will gain a deep understanding of how software interacts with hardware, how data is stored and manipulated in memory, and how operating systems and other system software work.

- ✓ Learn the fundamentals of C++ and prepare for CPE certification
- ✓ Develop analytical skills using C++
- ✓ Explore data types, variables, operators, and more

Course Details

Target Audience: Secondary, 2-year and 4-year college students

Estimated Time to Completion: 42 hours

Prerequisites: None

Course Delivery: Instructor-led

Learning Component Highlights:

- 4 modules of interactive instructional content
- Practice labs
- Chapter and final exams

Course Recognitions: Certificate of Completion

Certification Alignment: CPE – C++ Certified Entry-Level Programmer Certification

Recommended Next Course: C++ Essentials 2

Requirements

- ASC Alignment: Recommended
- Instructor Training: Optional
- Physical Equipment: Not required

Developed in collaboration with
The C++ Institute

C++ Institute
Open Education & Development Group

Networking Academy

Institute
Open Education & Development Group

C++ Essentials 1

Scope and Sequence

Version 1.0

Developed in collaboration with
OpenEDG C++ Institute

Contents

Target Audience

C++ Essentials 1 (CPPE1) is tailored for individuals with no prior programming experience who wish to embark on a journey of learning computer programming with a focus on C++. This course serves as an introductory yet comprehensive guide to the fundamental concepts of programming and the basics of C++.

The course is well-suited for:

- Beginners interested in learning C++ from scratch.
- Individuals seeking a structured introduction to computer programming principles using C++.
- Students and professionals aiming to obtain the CPE – C++ Certified Entry-Level Programmer certification.
- Hobbyists or self-taught programmers wishing to formalize their knowledge of C++.

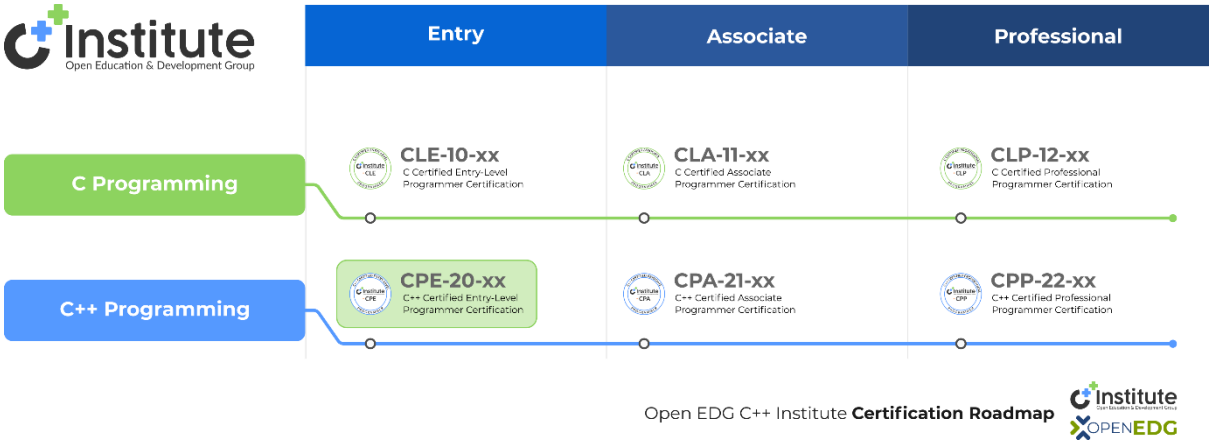
Course Prerequisites

No specific prerequisites required beyond the minimum:

- Basic computer literacy, including the ability to navigate and operate a computer.
- An interest in learning C++ and a commitment to completing the course modules and activities.
- No prior programming experience is required, making the course accessible to complete beginners.

Certification Alignment

C++ Essentials 1 is designed to prepare learners for the CPE – C++ Certified Entry-Level Programmer certification.



Open EDG C++ Institute **Certification Roadmap**

The certification validates the learner's understanding of basic programming concepts in C++, encompassing data types, control structures, functions, pointers, memory management, and an introduction to objects and exception handling. It serves as a testament to the candidate's proficiency in C++ programming fundamentals, essential for

entry-level programming roles and further professional development. It is also a stepping stone towards more advanced certifications such as the CPA – C++ Certified Associate Programmer.

Candidates can take the CPE – C++ Certified Entry-Level Programmer certification exam via the TestNow™ – OpenEDG Testing Service Platform.

Course Description

Developed by the OpenEDG C++ Institute and delivered in partnership with the Cisco Networking Academy, C++ Essentials 1 is **the first course in the "C++ Essentials" series**, introducing learners to the basics of programming with C++.

The course covers key programming concepts, **C++ syntax**, **variables**, **data types**, **control structures**, **functions**, **pointers**, **memory management**, **objects**, **namespaces**, and **basic exception handling**. Each module includes **study resources**, **quiz tests**, and **hands-on labs**, facilitating a practical learning experience.

- **Module 1**: Introduction to programming concepts, basic syntax, variables, and simple I/O operations.
- **Module 2**: Detailed exploration of control structures, additional data types, and structures.
- **Module 3**: In-depth look at functions, pointers, parameter passing, memory management, and data sorting.
- **Module 4**: Advanced data handling, string manipulation, namespace usage, and foundational exception handling techniques.

Course Objectives

1. **Understand** the fundamental concepts of computer programming and the basics of the C++ language (Module 1).
2. **Apply** basic C++ syntax and constructs to solve simple programming tasks (Module 1 & 2).
3. **Analyze** problems and implement solutions using functions, pointers, and memory management techniques (Module 3).
4. **Evaluate** and handle data using advanced techniques and manage exceptions in C++ (Module 4).

Equipment Requirements

- Access to a computer with an internet connection to participate in online course activities.
- A modern web browser installed on the computer.
- While the course can be accessed online, learners have the option to download and install an offline Integrated Development Environment (IDE). Detailed instructions and recommendations for IDE setup are provided in the welcome module.

Course Outline

MODULE NUMBER AND NAME	RESOURCES	OBJECTIVES COVERED
Welcome to C++ Essentials 1	Course Structure, Certification Opportunities, and Getting Started with C++ Programming	Find out how to start and use this course for a comprehensive intro to C++ programming. Learn about the course layout, how to navigate it, understand the certification it prepares you for, and get insights into using coding tools.
Module 1: Intro to Programming and Basics of C++	Study Pages, Labs, and Module 1 Test	After completing Module 1, the learner will grasp basic programming concepts and C++ syntax.
Module 2: Control Structures and Data Types in C++	Study Pages, Labs, and Module 2 Test	After completing Module 2, the learner will utilize control structures and explore C++ data types effectively.
Module 3: Functions, Pointers, and Memory Management	Study Pages, Labs, and Module 3 Test	After completing Module 3, the learner will master functions, pointers, and memory management in C++.
Module 4: Advanced Data Handling and Exception Handling in C++	Study Pages, Labs, and Module 4 Test	After completing Module 4, the learner will handle complex data types and manage exceptions effectively.
Course Completion	C++ Essentials 1 – Final Test (Score 70% or more to qualify for a 20% discount on the CPE exam) + Become CPE certified (Paid Option)	After completing the C++ Essentials 1 course Final Test, the learner will critically assess and integrate their understanding of key C++ programming concepts, including the use of control structures, functions, pointers, memory management, and basic object-oriented programming. They will demonstrate the ability to design solutions to problems using appropriate data types and

		structures, manage program flow effectively, and utilize exception handling mechanisms to create robust programs. This objective signifies the learner's comprehensive grasp of the material presented throughout the course, highlighting their capability to apply theoretical knowledge to practical programming tasks. It showcases their preparedness for the CPE certification and sets a solid foundation for advanced studies in C++ programming, enabling them to pursue further professional development and technical proficiency in the field.

Why Learn C++

Learning C++ opens vast opportunities in software development, system programming, game development, and beyond.

C++ Essentials 1 provides a solid foundation in programming, equipping learners with the skills to build efficient and scalable applications.

With the CPE certification, candidates can demonstrate their commitment to mastering C++ programming, setting the stage for further learning and professional growth in the expansive world of technology.
