C Essentials 1

Scope and Sequence

Version 1.0

Developed in collaboration with
OpenEDG C++ Institute

Contents

Target Audience

The C Essentials 1 (**CE1**) course is designed for individuals interested in beginning their journey into computer programming, specifically through the C language. It serves as **an introductory course** for those new to programming or those transitioning from other languages to C.

The course is well-suited for:

- Individuals with no prior programming experience seeking a structured and comprehensive introduction to computer programming.
- Students and professionals looking to acquire a foundational understanding of the C programming language.
- Hobbyists or self-taught programmers aiming to formalize their knowledge and skills in C.
- Individuals preparing for the CLE – C Certified Entry-Level Programmer certification to enhance their programming credentials.

Course Prerequisites

No specific prerequisites required beyond the minimum:

- **Basic computer literacy** and familiarity with **operating a computer**.
- **Motivation** and **commitment** to engage with the course content and complete the modules.
- **No prior programming experience** is required, making it accessible to **beginners**.

Certification Alignment

This course is tailored to prepare learners for the CLE – C Certified Entry-Level Programmer certification.
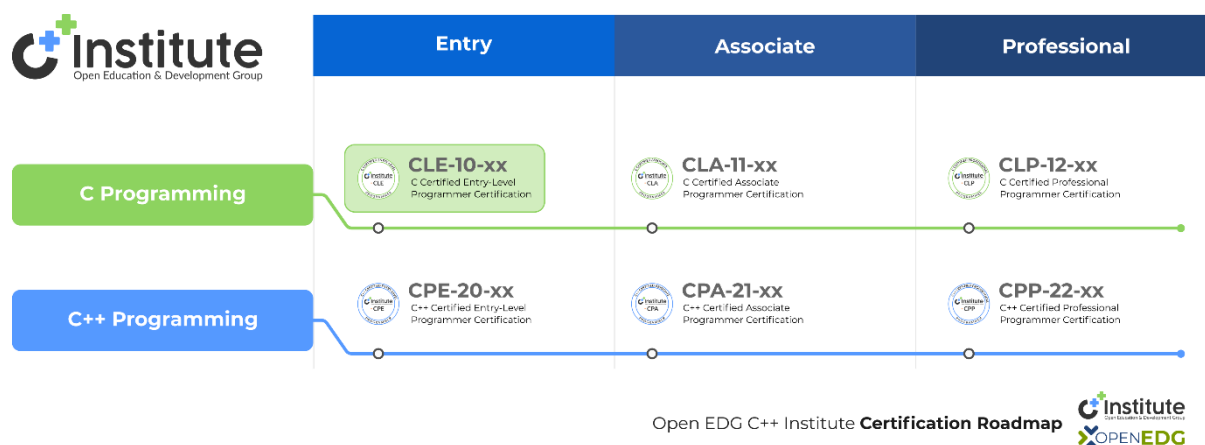
The certification validates the learner's understanding of **fundamental programming concepts**, **C language syntax**, **semantics**, and **essential programming techniques**. It serves as a solid foundation for entry-level C programming positions and is a stepping

stone towards more advanced certifications such as the [CLA – C Certified Associate Programmer](#).

Candidates can take the CLE – Certified Entry-Level C 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 inaugural course in the "C Essentials" series**.

The course introduces learners to basic computer programming concepts using the C language. The course covers syntax, variables, control structures, functions, pointers, memory management, and fundamental program writing and debugging skills. Each of the **five modules** includes **study resources**, **quiz tests**, and **hands-on labs** for practical application.

- **Module 1**: Introduction to programming languages, the compilation process, and basic program writing.
- **Module 2**: Understanding data types, operations, flow control, and basic input/output functions.
- **Module 3**: Conditional statements, loops, more data types, and an introduction to logic in programming.
- **Module 4**: The concept of arrays, pointers, strings, and their manipulation in C.
- **Module 5**: Advanced operations with arrays and pointers, memory management, and the fundamentals of functions in C.

Course Objectives

1. **Understand** the basic concepts of computer programming and the role of compilation (Module 1).
2. **Apply** knowledge of variables, data types, and control structures to write simple C programs (Modules 1 & 2).
3. **Analyze** problems and implement solutions using conditional execution and loops (Module 3).
4. **Evaluate** and manipulate data using arrays, pointers, and strings (Module 4).
5. **Create** programs that efficiently manage memory and use functions for structured coding (Module 5).

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 Computer Programming and the C Language	Study Pages, Labs, and Module 1 Test	After completing Module 1, the learner will understand programming languages and the compilation process, and be able to write simple programs.
Module 2: Data Types, Operations, and the Basics of Flow Control	Study Pages, Labs, and Module 2 Test	After completing Module 2, the learner will apply arithmetic operations, control structures, and input/output functions in C.
Module 3: Conditions, Loops, More Data Types, and Computer Logic	Study Pages, Labs, and Module 3 Test	After completing Module 3, the learner will analyze and implement solutions using conditional statements and loops.
Module 4: Arrays, Pointers, and Strings	Study Pages, Labs, and Module 4 Test	After completing Module 4, the learner will evaluate and manipulate data structures such as arrays and strings using pointers.
Module 5: Advanced Array and Pointer Operations, Memory Management, and Function Fundamentals	Study Pages, Labs, and Module 5 Test	After completing Module 5, the learner will create programs with efficient memory management and structured functions.
Course Completion	C Essentials 1 – Final Test (Score 70% or more to qualify for a	After completing the course Final Test, the learner will evaluate and synthesize their ability to analyze

	20% discount on the CLE exam) + Become CLE certified (Paid Option)	problems, design solutions using appropriate data structures and algorithms, and effectively utilize control structures, functions, arrays, pointers, and memory management techniques. This objective reflects the learner's ability to not only recall and understand the material covered throughout the course but also to apply, analyze, and synthesize this knowledge in practical scenarios, showcasing readiness for the CLE certification and further studies in C programming.

Why Learn C

Learning C programming opens numerous doors in the technology world. It's not just about understanding a programming language; it's about gaining a deep understanding of how software interacts with hardware.

C is foundational for learning more complex languages and is essential in fields like system/software development, embedded programming, and operating systems.

With this knowledge, you can contribute to a wide range of projects from developing system applications to contributing to open-source projects, enhancing your career opportunities in the modern technological landscape.