55337: Introduction to Programming

Duration: 5 Days
Method: Instructor-Led Training (ILT) | Live Online Training

Course Description

In this course, participants will learn the basics of computer programming using Microsoft® Visual Studio® and the Visual C# and Visual Basic programming languages. The course assumes no prior programming experience and introduces the concepts needed to progress to the intermediate courses on programming, Programming in C#. The focus will be on core programming concepts such as computer storage, data types, decision structures, and repetition by using loops. The course also covers an introduction to object-oriented programming covering classes, encapsulation, inheritance, and polymorphism. Coverage is also included around exception handling, application security, performance, and memory management.

Target Audience

This course is intended for:

- Anyone who is new to software development and wants, or needs, to gain an understanding of programming fundamentals and object-oriented programming concepts.

Prerequisites

To attend this course, candidates must be able to:

- Use computers to start programs, open and save files, navigate application menus and interfaces.
- Understand logical concepts such as comparisons.
- Understand number theory.
- Create, understand, and follow structured directions or step-by-step procedures.
- Understand and apply abstract concepts to concrete examples.

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Course Objectives

Upon successful completion of this course, attendees will be able to:
- Explain core programming fundamentals such as computer storage and processing.
- Explain computer number systems such as binary.
- Create and use variables and constants in programs.
- Explain how to create and use functions in a program.
- Create and use decisions structures in a computer program.
- Create and use repetition (loops) in a computer program.
- Explain pseudocode and its role in programming.
- Explain the basic computer data structures such as arrays, lists, stacks, and queues.
- Implement object-oriented programming concepts.
- Create and use classes in a computer program.
- Implement encapsulation, inheritance, and polymorphism.
- Describe the base class library (BCL) in the .NET Framework.
- Explain the application security concepts.
- Implement simple I/O in a computer program.
- Identify application errors and explain how to debug an application and handle errors.
- Identify the performance considerations for applications.

Course Topics

Module 1: Introduction to Core Programming Concepts
- Computer Data Storage and Processing
- Application Types
- Application Lifecycle
- Code Compilation

Module 2: Core Programming Language Concepts
- Syntax
- Data Types
- Variables and Constants

Module 3: Program Flow
- Introduction to Structured Programming Concepts
- Introduction to Branching
- Using Functions
- Using Decision Structures
- Introducing Repetition

Course Topics *Continued*

Module 4: Algorithms and Data Structures
- Understand How to Write Pseudocode
- Algorithm Examples
- Introduction to Data Structures

Module 5: Error Handling and Debugging
- Introduction to Program Errors
- Introduction to Structured Error Handling
- Introduction to Debugging

Module 6: Introduction to Object-Oriented Programming
- Introduction to Complex Structures
- Introduction to Structs
- Introduction to Classes
- Introducing Encapsulation

Module 7: More Object-Oriented Programming
- Introduction to Inheritance
- Introduction to Polymorphism
- Introduction to .NET and the Base Class Library

Module 8: Introduction to Application Security
- Authentication and Authorization
- Code Permissions on Computers
- Introducing Code Signing

Module 9: Core I/O Programming
- Using Console I/O
- Using File I/O

Module 10: Application Performance and Memory Management
- Value Types vs Reference Types
- Converting Types
- The Garbage Collector

LABS INCLUDED

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