55339: Programming in C#

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

Course Description

This course teaches developers the programming skills that are required to create applications using the C# language. During the course, participants will review the basics of C# program structure, language syntax, and implementation details. They will then consolidate their knowledge throughout the course as they build an application that incorporates several features of .NET.

NOTE: *The course aims to follow the spirit of the Microsoft® Official Curriculum course 20483 while bringing it completely up to date with the latest features of C#, .NET 6.0, and Visual Studio 2022.*

Target Audience

This course is intended for:

- Experienced developers who already have programming experience in C, C++, JavaScript, Objective-C, Microsoft Visual Basic®, or Java and understand the concepts of object-oriented programming.

    NOTE: *This course is not designed for students who are new to programming.*

Prerequisites

To attend this course, candidates must have:

- Some limited experience using C# to complete basic programming tasks.
- First-hand experience using C# that demonstrates their understanding of the following:
    - How to name, declare, initialize, and assign values to variables within an application.
    - How to use: arithmetic operators to perform arithmetic calculations involving one or more variables; relational operators to evaluate the relationship between two variables or expressions; logical operators to combine expressions that contain relational operators.
    - How to create the code syntax for simple programming statements using C# language keywords and recognize syntax errors using the Visual Studio IDE.
    - How to create a simple branching structure using an IF statement.

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Prerequisites *Continued*

To attend this course, candidates must have:

- First-hand experience using C# that demonstrates their understanding of the following:
  - How to create a simple looping structure using a FOR statement to iterate through a data array.
  - How to use the Visual Studio IDE to locate simple logic errors.
  - How to create a Function that accepts arguments (parameters and returns a value of a specified type).
  - How to design and build a simple user interface using standard controls from the Visual Studio toolbox.
  - How to connect to a SQL Server database and the basics of how to retrieve and store data.
  - How to sort data in a loop.
  - How to recognize the classes and methods used in a program.

Course Objectives

Upon successful completion of this course, attendees will be able to:

- Describe the core syntax and features of C#.
- Create methods, handle exceptions, and describe the monitoring requirements of large-scale applications.
- Implement the basic structure and essential elements of a typical desktop application.
- Create classes, define, and implement interfaces, and create and use generic collections.
- Use inheritance to create a class hierarchy and to extend a .NET class.
- Read and write data by using file input/output and streams and serialize and deserialize data in different formats.
- Create and use an entity data model for accessing a database and use LINQ to query data.
- Access and query remote data by using the types in the System.Net namespace and WCF Data Services.
- Build a graphical user interface by using XAML.
- Improve the throughput and response time of applications by using tasks and asynchronous operations.
- Integrate unmanaged libraries and dynamic components into a C# application.
- Examine the metadata of types by using reflection, create and use custom attributes, generate code at runtime, and manage assembly versions.
- Encrypt and decrypt data by using symmetric and asymmetric encryption.

Course Topics

Module 1: Review of C# Syntax
- Overview of Writing Application by Using C#
- Data Types, Operators, and Expressions
- C# Programming Language Constructs

Module 2: Creating Methods, Handling Exceptions, and Monitoring Applications
- Creating and Invoking Methods
- Creating Overloaded Methods and Using Optional and Output Parameters
- Handling Exceptions
- Monitoring Applications

Module 3: Basic types and constructs of C#
- Implementing Structs and Enums
- Organizing Data into Collections
- Handling Events

Module 4: Creating Classes and Implementing Type-Safe Collections
- Creating Classes
- Defining and Implementing Interfaces
- Implementing Type-Safe Collections

Module 5: Creating a Class Hierarchy by Using Inheritance
- Creating Class Hierarchies
- Extending .NET Classes

Module 6: Reading and Writing Local Data
- Reading and Writing Files
- Serializing and Deserializing Data
- Performing I/O by Using Streams

Module 7: Accessing a Database
- Creating and Using Entity Data Models
- Querying Data by Using LINQ

Module 8: Accessing Remote Data
- Accessing Data Across the Web
- Accessing Data by Using OData Connected Services

Course Topics *Continued*

Module 9: Designing the User Interface for a Graphical Application
- Using XAML to Design a User Interface
- Binding Controls to Data

Module 10: Improving Application Performance and Responsiveness
- Implementing Multitasking
- Performing Operations Asynchronously
- Synchronizing Concurrent Access to Data

Module 11: Integrating with Unmanaged Code
- Creating and Using Dynamic Objects
- Managing the Lifetime of Objects and Controlling Unmanaged Resources

Module 12: Creating Reusable Types and Assemblies
- Examining Object Metadata
- Creating and Using Custom Attributes
- Generating Managed Code
- Versioning, Signing, and Deploying Assemblies

Module 13: Securing Data
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LABS INCLUDED

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