

# uCertify

## Course Outline

C# 10.0 All-in-one



05 Jul 2024

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Videos and How To

## 8. Live labs

Lab Tasks

Here's what you get

## 1. Course Objective

The C# 10.0 All-in-one Course is designed to take you from a beginner to an advanced C# developer. This course covers everything you need to know about C# programming, starting from the basics to more advanced topics. You'll learn the core principles of the C# language, explore Object-Oriented Programming (OOP), discover advanced language features, and see how to apply these skills in web development using ASP.NET Core.

## 2. Quiz

Quizzes test your knowledge on the topics of the exam when you go through the course material. There is no limit to the number of times you can attempt it.

**300**  
QUIZ

## 3. flashcards

Flashcards are effective memory-aiding tools that help you learn complex topics easily. The flashcard will help you in memorizing definitions, terminologies, key concepts, and more. There is no limit to the number of times learners can attempt these. Flashcards help master the key concepts.

**180**  
FLASHCARDS

## 4. Glossary of terms

uCertify provides detailed explanations of concepts relevant to the course through Glossary. It contains a list of frequently used terminologies along with its detailed explanation. Glossary defines the key terms.



## 5. Expert Instructor-Led Training

uCertify uses the content from the finest publishers and only the IT industry's finest instructors. They have a minimum of 15 years real-world experience and are subject matter experts in their fields. Unlike a live class, you can study at your own pace. This creates a personal learning experience and gives you all the benefit of hands-on training with the flexibility of doing it around your schedule 24/7.

## 6. ADA Compliant & JAWS Compatible Platform

uCertify course and labs are ADA (Americans with Disability Act) compliant. It is now more accessible to students with features such as:

- Change the font, size, and color of the content of the course
- Text-to-speech, reads the text into spoken words
- Interactive videos, how-tos videos come with transcripts and voice-over
- Interactive transcripts, each word is clickable. Students can clip a specific part of the video by clicking on a word or a portion of the text.

JAWS (Job Access with Speech) is a computer screen reader program for Microsoft Windows that reads the screen either with a text-to-speech output or by a Refreshable Braille display. Student can easily navigate uCertify course using JAWS shortcut keys.

## 7. State of the Art Educator Tools

uCertify knows the importance of instructors and provide tools to help them do their job effectively. Instructors are able to clone and customize course. Do ability grouping. Create sections. Design grade scale and grade formula. Create and schedule assessments. Educators can also move a student from self-paced to mentor-guided to instructor-led mode in three clicks.

## 8. Award Winning Learning Platform (LMS)

uCertify has developed an award winning, highly interactive yet simple to use platform. The SIIA CODiE Awards is the only peer-reviewed program to showcase business and education technology's finest products and services. Since 1986, thousands of products, services and solutions have been recognized for achieving excellence. uCertify has won CODiE awards consecutively for last 7 years:

- **2014**

1. Best Postsecondary Learning Solution

- **2015**

1. Best Education Solution
2. Best Virtual Learning Solution
3. Best Student Assessment Solution
4. Best Postsecondary Learning Solution
5. Best Career and Workforce Readiness Solution
6. Best Instructional Solution in Other Curriculum Areas
7. Best Corporate Learning/Workforce Development Solution

- **2016**

1. Best Virtual Learning Solution
2. Best Education Cloud-based Solution
3. Best College and Career Readiness Solution
4. Best Corporate / Workforce Learning Solution
5. Best Postsecondary Learning Content Solution

6. Best Postsecondary LMS or Learning Platform
7. Best Learning Relationship Management Solution

- **2017**

1. Best Overall Education Solution
2. Best Student Assessment Solution
3. Best Corporate/Workforce Learning Solution
4. Best Higher Education LMS or Learning Platform

- **2018**

1. Best Higher Education LMS or Learning Platform
2. Best Instructional Solution in Other Curriculum Areas
3. Best Learning Relationship Management Solution

- **2019**

1. Best Virtual Learning Solution
2. Best Content Authoring Development or Curation Solution
3. Best Higher Education Learning Management Solution (LMS)

- **2020**

1. Best College and Career Readiness Solution
2. Best Cross-Curricular Solution
3. Best Virtual Learning Solution

## 9. Chapter & Lessons

uCertify brings these textbooks to life. It is full of interactive activities that keeps the learner engaged. uCertify brings all available learning resources for a topic in one place so that the learner can efficiently learn without going to multiple places. Challenge questions are also embedded in the chapters so learners can attempt those while they are learning about that particular topic. This helps them grasp the concepts better because they can go over it again right away which improves learning.

Learners can do Flashcards, Exercises, Quizzes and Labs related to each chapter. At the end of every lesson, uCertify courses guide the learners on the path they should follow.

# Syllabus

## Chapter 1: Introduction

- About This Course
- General Assumptions
- Icons Used in This Course
- Where to Go from Here

## Chapter 2: Creating Your First C# Console Application

- Getting a Handle on Computer Languages, C#, and .NET
- Creating Your First Console Application
- Making Your Console App Do Something
- Reviewing Your Console Application
- Replacing All that Ceremonial Code: Top-Level Statements
- Introducing the Toolbox Trick
- Interacting with C# Online
- Working with Jupyter Notebook: The Short Version

## Chapter 3: Living with Variability — Declaring Value-Type Variables



- Declaring a Variable
- What's an int?
- Representing Fractions
- Handling Floating-Point Variables
- Using the Decimal Type: Is It an Integer or a Float?
- Examining the bool Type: Is It Logical?
- Checking Out Character Types
- What's a Value Type?
- Comparing string and char
- Calculating Leap Years: DateTime
- Declaring Numeric Constants
- Changing Types: The Cast
- Letting the C# Compiler Infer Data Types

## Chapter 4: Pulling Strings

- The Union Is Indivisible, and So Are Strings
- Performing Common Operations on a String
- Comparing Strings

- What If I Want to Switch Case?
- Looping through a String
- Searching Strings
- Getting Input from Users in Console Applications
- Controlling Output Manually
- Formatting Your Strings Precisely
- StringBuilder: Manipulating Strings More Efficiently

## Chapter 5: Smooth Operators

- Performing Arithmetic
- Performing Logical Comparisons — Is That Logical?
- Matching Expression Types at [TrackDownAMate.com](http://TrackDownAMate.com)

## Chapter 6: Getting into the Program Flow

- Branching Out with if and switch
- Here We Go Loop-the-Loop
- Looping a Specified Number of Times with for

## Chapter 7: Lining Up Your Ducks with Collections

- The C# Array
- Processing Arrays by Using foreach
- Sorting Arrays of Data
- Using var for Arrays
- Loosening Up with C# Collections
- Understanding Collection Syntax
- Using Lists
- Using Dictionaries
- Array and Collection Initializers
- Using Sets

## Chapter 8: Stepping through Collections

- Iterating through a Directory of Files
- Iterating foreach Collections: Iterators
- Accessing Collections the Array Way: Indexers
- Looping Around the Iterator Block

## Chapter 9: Buying Generic

- Writing a New Prescription: Generics
- Classy Generics: Writing Your Own
- Understanding Variance in Generics

## Chapter 10: Some Exceptional Exceptions

- Using an Exceptional Error-Reporting Mechanism
- Can I Get an Exceptional Example?
- Working with Custom Exceptions
- Planning Your Exception-Handling Strategy
- Grabbing Your Last Chance to Catch an Exception
- Throwing Expressions

## Chapter 11: Creating Lists of Items with Enumerations

- Seeing Enumerations in the Real World
- Working with Enumerations
- Creating Enumerated Flags
- Defining Enumerated Switches
- Working with Enumeration Methods

## Chapter 12: Showing Some Class

- A Quick Overview of Object-Oriented Programming
- Defining a Class and an Object
- Accessing the Members of an Object
- Working with Object-Based Code
- Discriminating between Objects
- Can You Give Me References?
- Classes That Contain Classes Are the Happiest Classes in the World
- Generating Static in Class Members
- Defining const and readonly Data Members

## Chapter 13: We Have Our Methods

- Defining and Using a Method
- Method Examples for Your Files
- Having Arguments with Methods
- Using the Call-by-Reference Feature
- Defining a Method with No Return Value
- Returning Multiple Values Using Tuples

## Chapter 14: Let Me Say This about this

- Passing an Object to a Method
- Comparing Static and Instance Methods
- Accessing the Current Object
- Using Local Functions

## Chapter 15: Holding a Class Responsible

- Restricting Access to Class Members
- Why You Should Worry about Access Control
- Defining Class Properties
- Using Target Typing for Your Convenience
- Dealing with Covariant Return Types
- Getting Your Objects Off to a Good Start — Constructors
- Using Expression-Bodied Members

## Chapter 16: Inheritance: Is That All I Get?

- Why You Need Inheritance
- Inheriting from a BankAccount Class (a More Complex Example)

- IS\_A versus HAS\_A — I'm So Confused\_A
- Other Features That Support Inheritance

## Chapter 17: Poly-what-ism?

- Overloading an Inherited Method
- Polymorphism
- C# During Its Abstract Period
- Sealing a Class

## Chapter 18: Interfacing with the Interface

- Introducing CAN\_BE\_USED\_AS
- Knowing What an Interface Is
- Using an Interface
- Using the C# Predefined Interface Types
- Looking at a Program That CAN\_BE\_USED\_AS an Example
- Unifying Class Hierarchies
- Hiding Behind an Interface
- Inheriting an Interface

- Using Interfaces to Manage Change in Object-Oriented Programs

## Chapter 19: Delegating Those Important Events

- E.T., Phone Home — The Callback Problem
- Defining a Delegate
- Pass Me the Code, Please — Examples
- A More Real-World Example
- Shh! Keep It Quiet — Anonymous Methods
- Stuff Happens — C# Events

## Chapter 20: Can I Use Your Namespace in the Library?

- Dividing a Single Program into Multiple Source Files
- Working with Global using Statements
- Dividing a Single Program into Multiple Assemblies
- Putting Your Classes into Class Libraries
- Going Beyond Public and Private: More Access Keywords
- Putting Classes into Namespaces
- Working with Partial Methods



## Chapter 21: Improving Productivity with Named and Optional Parameters

- Exploring Optional Parameters
- Looking at Named Parameters
- Using Alternative Methods to Return Values
- Dealing with null Parameters

## Chapter 22: Interacting with Structures

- Comparing Structures to Classes
- Creating Structures
- Working with Read-only Structures
- Working with Reference Structures
- Using Structures as Records
- Using the New Record Type

## Chapter 23: Writing Secure Code

- Designing Secure Software
- Building Secure Windows Applications
- Using System.Security

## Chapter 24: Accessing Data

- Getting to Know System.Data
- How the Data Classes Fit into the Framework
- Getting to Your Data
- Using the System.Data Namespace

## Chapter 25: Fishing the File Stream

- Going Where the Fish Are: The File Stream
- StreamWriter for Old Walter
- Pulling Them Out of the Stream: Using StreamReader
- More Readers and Writers
- Exploring More Streams than Lewis and Clark

## Chapter 26: Accessing the Internet

- Getting to Know System.Net
- How Net Classes Fit into the Framework
- Using the System.Net Namespace

## Chapter 27: Creating Images

- Getting to Know System.Drawing
- How the Drawing Classes Fit into the Framework
- Using the System.Drawing Namespace

## Chapter 28: Programming Dynamically!

- Shifting C# Toward Dynamic Typing
- Employing Dynamic Programming Techniques
- Putting Dynamic to Use
- Running with the Dynamic Language Runtime
- Using Static Anonymous Functions

## Chapter 29: Getting Started with Visual Studio

- Versioning the Versions
- Installing Visual Studio
- Breaking Down the Projects

## Chapter 30: Using the Interface

- Designing in the Designer
- Paneling the Studio

- Coding in the Code Editor
- Using the Tools of the Trade
- Using the Debugger as an Aid to Learning

## Chapter 31: Customizing Visual Studio

- Setting Options
- Creating Your Own Templates

## Chapter 32: Introducing WPF

- Understanding What WPF Can Do
- Introducing XAML
- Diving In! Creating Your First WPF Application
- Whatever XAML Can Do, C# Can Do Better!

## Chapter 33: Understanding the Basics of WPF

- Using WPF to Lay Out Your Application
- Arranging Elements with Layout Panels
- Exploring Common XAML Controls

## Chapter 34: Data Binding in WPF

- Getting to Know Dependency Properties
- Exploring the Binding Modes
- Investigating the Binding Object
- Editing, Validating, Converting, and Visualizing Your Data
- Finding Out More about WPF Data Binding

## Chapter 35: Practical WPF

- Commanding Attention
- Using Built-In Commands
- Using Custom Commands
- Using Routed Commands

## Chapter 36: Programming for Windows 10 and Above

- What is the Universal Windows Platform (UWP)?
- Devices Supported by the UWP
- Creating Your Own UWP App
- Working with .NET Core Applications

## Chapter 37: Creating a Basic ASP.NET Core App

- Understanding the ASP.NET Core Templates
- Developing a Basic Web App

## Chapter 38: Employing the Razor Markup Language

- Avoiding Nicks from Razor
- Creating Variables
- Keeping Things Logical
- Implementing Loops

## Chapter 39: Generating and Consuming Data

- Understanding Why These Projects Are Important
- Serialized Data Isn't for Breakfast
- Developing a Data Generator and API
- Creating a Consumer Website

## 10. Live Labs

The benefits of live-labs are:

- Exam based practical tasks
- Real equipment, absolutely no simulations
- Access to the latest industry technologies
- Available anytime, anywhere on any device
- Break and Reset functionality
- No hardware costs

## Lab Tasks

### Creating Your First C# Console Application

- Creating a Source Program
- Executing a Source Program

### Pulling Strings

- Executing the ModifyString Example Program
- Building a Sentence
- Using Advanced Pattern Matching
- Parsing Numeric Input
- Handling a Series of Numbers
- Formatting Output Using Trim and Pad Methods

### Smooth Operators

- Demonstrating Operator Overloading

### Getting into the Program Flow

- Calculating the Interest Using the if Statement
- Calculating the Amount of Principle Through Looping

### Lining Up Your Ducks with Collections

- Calculating the Average of Numbers
- Processing Arrays by Using the foreach Loop
- Sorting Arrays of Data

### **Stepping through Collections**

- Iterating Through a Directory of Files

### **Buying Generic**

- Creating a Priority Queue

### **Some Exceptional Exceptions**

- Demonstrating Exception Handling

### **Creating Lists of Items with Enumerations**

- Demonstrating the Working of Enumerations

### **Showing Some Class**

- Demonstrating Working with Object-Based Code

### **We Have Our Methods**

- Implementing Default Arguments

### **Let Me Say This about this**

- Passing an Object to a Method
- Employing Static Properties and Methods
- Employing Instance Properties and Methods
- Using Attributes with Local Functions

### **Holding a Class Responsible**

- Solving the Rounding Problem
- Using Target Typing



### **Inheritance: Is That All I Get?**

- Inheriting from a BankAccount Class

### **Poly-what-ism?**

- Demonstrating the Polymorphic Nature of AbstractInheritance

### **Interfacing with the Interface**

- Demonstrating the Implementation of the Incomparable IComparable<T> Interface

### **Delegating Those Important Events**

- Demonstrating the Action, Func, and Predicate Delegate Types
- Using Static Anonymous Methods

### **Can I Use Your Namespace in the Library?**

- Analyzing a Project with a Class Library

### **Interacting with Structures**

- Using Supplemental Struct Elements
- Demonstrating a read-only Structure

### **Writing Secure Code**

- Creating a Windows Application

### **Accessing Data**

- Setting Up a Sample Database Schema

### **Fishing the File Stream**

- Using StreamWriter

## **Accessing the Internet**

- Demonstrating the Use of System.Net Namespace

## **Creating Images**

- Demonstrating the Use of System.Drawing Namespace

## **Customizing Visual Studio**

- Developing a Project Template
- Developing an Item Template

## **Introducing WPF**

- Creating a WPF Application

## **Understanding the Basics of WPF**

- Creating a Canvas
- Creating a Data Entry Form
- Demonstrating Display-Only Controls

## **Data Binding in WPF**

- Binding a Data Object with XAML
- Validating the Data

## **Practical WPF**

- Demonstrating the Use of Routed Commands

## **Programming for Windows 10 and Above**

- Analyzing a UWP Project

## **Creating a Basic ASP.NET Core App**

- Analyzing a Basic Web App

## Employing the Razor Markup Language

- Overviewing a Razor Page

## Generating and Consuming Data

- Developing a Data Generator and API

## Here's what you get

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LIVE LABS

**51**


VIDEO TUTORIALS

**01:28**

HOURS

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