



MCSD Certification Toolkit

Exam 70-483

Programming in C#

Tiberiu Covaci, Gerry O'Brien, Rod Stephens, Vincent Varallo

MCS D CERTIFICATION TOOLKIT (EXAM 70-483)

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Tiberiu Covaci
Gerry O'Brien
Rod Stephens
Vince Varallo



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*To Lia for her patience and understanding during the
writing process. All my love.*

—GERRY O'BRIEN

For Maki.

—ROD STEPHENS

To Renee, Madison, and Courtney.

—VINCE VARALLO

ABOUT THE AUTHORS

TIBERIU COVACI is an Independent trainer and mentor teaching C# and .NET in general, and ASP.NET and parallel computing in particular. He works closely with Microsoft Learning helping them develop new courses, conducting beta classes and doing technology reviews for the upcoming courses. He was part of the Microsoft Certified Trainer Advisory Council between 2010 and 2012.

Tiberiu is a popular speaker at industry conferences and user groups around the world. His sessions and workshops get good reviews from both the attendees and the organizers.

Tiberiu is a Microsoft Certified Trainer and holds almost all .NET certification from .NET 2.0 and forward. He is as well an IASA certified trainer, an ASP.NET Insider, and a Telerik Insider. He is an INETA Speaker Bureau member and IASA Speaker. For his dedication and passion, Microsoft and Telerik presented Tibi with the MVP Award.

Tiberiu is the husband of lovely Nicoleta and the proud father of Anna and Disa.

GERRY O'BRIEN currently works at Microsoft as a program manager in Microsoft Learning where he manages internal tools and platforms working with teams of developers and testers. Prior to the program manager role, Gerry worked as the Certification Product Planner for the developer and SQL Server audiences at Microsoft Learning. In that role, he planned the exam portfolio for these audiences, working with industry experts to define the exam content and manage the exam from envisioning through development, beta, and release. Prior to working at Microsoft, Gerry worked as a software development consultant and trainer.

ROD STEPHENS started out as a mathematician, but, while studying at MIT, discovered how much fun programming is and has been programming professionally ever since. During his career, he has worked on an eclectic assortment of applications in such fields as telephone switching, billing, repair dispatching, tax processing, wastewater treatment, concert ticket sales, cartography, and training for professional football players.

Rod is a Microsoft Visual Basic Most Valuable Professional (MVP) and has taught introductory programming at ITT Technical Institute. He has written more than two dozen books that have been translated into languages from all over the world, and more than 250 magazine articles covering Visual Basic, C#, Visual Basic for Applications, Delphi, and Java.

Rod's popular VB Helper website (www.vb-helper.com) receives several million hits per month and contains thousands of pages of tips, tricks, and example programs for Visual Basic programmers, as well as example code for this book. His C# Helper website (www.csharpHelper.com) contains similar material for C# programmers.

You can contact Rod at RodStephens@csharpHelper.com or RodStephens@vb-helper.com.

VINCE VARALLO has been developing applications using Microsoft technologies for the past 17 years. He began his career as a Visual Basic 3 developer and has worked with VB 4, 5, and 6 until the .NET Framework 1.0 was released. He was an early adopter of ASP.NET and C#, and has concentrated on line-of-business applications throughout his entire career. He is currently the director of Technology Solutions at a digital marketing agency where he works with a wide variety of technologies. He previously authored *ASP.NET 3.5 Enterprise Application Development with Visual Studio 2008* and contributed as an author for *Professional Visual Basic 6: The 2003 Programmer's Resource*.

ABOUT THE TECHNICAL EDITOR

ANDERS BRATLAND combines his two passions, programming and teaching other people how to program, by working as a freelance consultant, which gives him the chance to work both as a Microsoft Certified Trainer and as a developer.

Anders is a well-known speaker at conferences like TechDays, Scandinavian Developer Conference, and Developer Summit. Anders is also active as speaker in different user groups, such as DotnetForum, and also as one of the organizers in the largest Swedish user group, Swenug.

Anders has a strong commitment to techniques and methods that can help projects to be successful, especially by adopting agile values and disciplines.

Anders is a Microsoft ASP.NET MVP and a member of the Swedish Microsoft Extended Expert Team, MEET.

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—Tiberiu Covaci

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INTRODUCTION

WHEN WE FIRST TALKED ABOUT WRITING THIS BOOK, our idea was to offer a way to our readers to learn to program using C#, and the byproduct of this process was for you to pass the 70-483 certification exam given by Microsoft. Being certified on specific technologies helps you in many ways. First, it helps you understand which parts are considered by the specialists to be important. Second, it helps you to understand a new technology by having a goal. Finally, it helps you in your career because certifications are recognized by employers, and this can give you advantage over other applicants.

WHO THIS BOOK IS FOR

Microsoft recommends that you have at least 1 year of experience programming in C# before attempting to take Exam 70-483. In addition, we recommend that you have some experience with other programming languages, although it is not necessary. If you are an experienced programmer, we recommend you to skim the chapters you are familiar with and read in detail those chapters you are not so confident about. If you are a novice programmer, we recommend you read the entire book, and make sure you understand all the chapter test questions and the study the Cheat Sheet at the end of every chapter.

WHAT THIS BOOK COVERS

This book covers C# language version 5.0 and .NET Framework version 4.5. We tried to cover all the skills measured by Exam 70-483, with each chapter focusing on specific key objectives. We provide, as well, many representative sample test questions that are similar to the ones used by Microsoft. You can find these questions at the end of every chapter.

HOW THIS BOOK IS STRUCTURED

Instead of following the test objectives as they were specified by Microsoft, this book follows a more natural approach to learning, where the knowledge base is built gradually.

In every chapter in this book you can find the following parts:

- A table showing how each chapter correlates to the test objectives
- Real-world case scenarios and code labs with solutions
- Advice, warnings, best practices, common mistakes, notes, and sidebars to point out important material
- Chapter test questions structured similar to how you will see questions on the exam
- Additional reading and resources

- Cheat Sheets
- Review of key terms

NOTE *The chapter test questions and answers, the Cheat Sheet, and Review of Key Terms are also available on the website for you to download and print.*

Following is a breakdown of each chapter's focuses:

Chapter 1, "Introducing the Programming C# Certification Test": This chapter introduces you to the Microsoft certification process and to the specifics of the 70-483 Programming in C# certification.

Chapter 2, "Basic Program Structure": This chapter covers the topics necessary for you to be successful in understanding core functionality in the C# programming language. Key topics enable you to learn about statements in C#, both simple and complex. At the end of this chapter, you will understand how to create basic programs in C#.

Chapter 3, "Working with the Type System": This chapter covers the type system in C#. You learn about value and reference types, how to define them, and how to use them. You also learn the basic concepts of object-oriented programming.

Chapter 4, "Using Types": This chapter talks about how to work with types, convert between data types, and work with dynamic types. After that you explore different ways to work with strings.

Chapter 5, "Creating and Implementing Class Hierarchies": This chapter continues the discussion about object-oriented programming (started in Chapter 3), and describes how to create class hierarchies and classes that implement common .NET interfaces. It also covers the object's life cycle and how to handle unmanaged resources.

Chapter 6, "Working with Delegates, Events, and Exceptions": This chapter continues the discussion started in Chapter 3 about the type system and talks about two special data types: exceptions and delegates. After that, it discusses how to work with delegates to create and use events.

Chapter 7, "Multithreading and Asynchronous Processing": This chapter shows you how to improve the performance of your application by using threads, tasks, and the new asynchronous programming paradigm introduced in C# 5.0.

Chapter 8, "Creating and Using Types with Reflection, Custom Attributes, the CodeDOM, and Lambda Expressions": Reflection is the capability to analyze code dynamically, read, modify, and even invoke behavior dynamically. You learn how to define metadata for your code by using `Attribute` classes. You also learn how to create code generators using the CodeDOM. Finally, you learn how to query sets of data using expression- and method-based lambda expressions.

Chapter 9, "Working with Data": This chapter looks at different ways to work with data sets. It discusses arrays, collections, and technologies such as ADO.NET, ADO.NET Entity Framework, and WCF Data Services and how to work with the I/O system.