

KOENIG SOLUTIONS · COURSE OUTLINE

C# Essentials (Microsoft, Visual Studio 2010)

Learn to build .NET Framework applications with C# and Visual Studio 2010, from language basics to LINQ and COM integration.

15

MODULES

44

TOPICS

18

HANDS-ON LABS

COURSE OVERVIEW

This course covers the .NET Framework and C# programming using Visual Studio 2010, starting with core language constructs, methods, exception handling and file input/output. It then addresses object-oriented programming, including creating types, encapsulation, inheritance, interfaces, object lifetime management, properties, indexers and operator overloading. Further modules cover delegates, lambda expressions, events, collections, generics and custom collection classes with enumeration support. The course concludes with querying data using LINQ and integrating C# code with dynamic languages such as Ruby and Python and with COM components.

WHO THIS COURSE IS FOR

C# Developers

Software Developers

.NET Developers

Application Programmers

LEARNING OBJECTIVES

- Explain the .NET Framework and Visual Studio 2010 project structure
- Apply core C# programming constructs such as loops and decisions
- Implement methods with optional and output parameters
- Handle and raise exceptions within C# applications
- Perform file input and output operations using streams
- Create new types including enumerations, classes and structs
- Implement inheritance, interfaces and abstract classes
- Build generic types and query data using LINQ

15 Modules, 44 Topics

01

Lab

Introducing C# and the .NET Framework

This module explains the .NET Framework, and using C# and Visual Studio 2010 for building .NET Framework applications.

LESSONS

- Introduction to the .NET Framework
- Creating Projects Within Visual Studio 2010
- Writing a C# Application
- Building a Graphical Application
- Documenting an Application
- Running and Debugging Applications by Using Visual Studio 2010

02

Lab

Using C# Programming Constructs

This module explains the syntax of basic C# programming constructs.

LESSONS

Declaring Variables and Assigning Values · Using Expressions and Operators · Creating and Using Arrays · Using Decision Statements · Using Iteration Statements

03

Lab

Declaring and Calling Methods

This module explains how to create and call methods.

LESSONS

- Defining and Invoking Methods
- Specifying Optional Parameters and Output Parameters

04

Lab

Handling Exceptions

This module explains how to catch exceptions and handle them. Students will also learn how to throw exceptions.

LESSONS

Handling Exceptions · Raising Exceptions

05**Lab**

Reading and Writing Files

This module explains how to perform basic file I/O operations in a C# application.

LESSONS

Accessing the File System · Reading and Writing Files by Using Streams

06**Lab**

Creating New Types

This module explains how to create and use new types (enumerations, classes, and structures)

LESSONS

Creating and Using Enumerations · Creating and Using Classes · Creating and Using Structs · Comparing References to Values

07**Lab**

Encapsulating Data and Methods

This module explains how to control the visibility and lifetime of members in a type.

LESSONS

Controlling Visibility of Type Members · Sharing Methods and Data

08**Lab**

Inheriting From Classes and Implementing Interfaces

This module explains how to use inheritance to create new reference types

LESSONS

- Using Inheritance to Define New Reference Types
- Defining and Implementing Interfaces
- Defining Abstract Classes

09**Lab**

Managing the Lifetime of Objects and Controlling Resources

This module explains how to manage the lifetime of objects and control the use of resources.

LESSONS

Introduction to Garbage Collection · Managing Resources

10

3 Labs

Encapsulating Data and Defining Overloaded Operators

This module explains how to create properties and indexers to encapsulate data, and how to define operators for this data.

LESSONS

[Creating and Using Properties](#) · [Creating and Using Indexers](#) · [Overloading Operators](#)

11

Lab

Decoupling Methods and Handling Events

This module explains how to decouple an operation from the method that implements an operation, and how to use these decoupled methods to handle asynchronous events.

LESSONS

[Declaring and Using Delegates](#) · [Using Lambda Expressions](#) · [Handling Events](#)

12

2 Labs

Using Collections and Building Generic Types

This module introduces collections, and describes how to use Generics to implement type-safe collection classes, structures, interfaces, and methods.

LESSONS

- [Using Collections](#)
- [Creating and Using Generic Types](#)
- [Defining Generic Interfaces and Understanding Variance](#)
- [Using Generic Methods and Delegates](#)

13

Lab

Building and Enumerating Custom Collection Classes

This module explains how to implement custom collection classes that support enumeration.

LESSONS

- [Implementing a Custom Collection Class](#)
- [Adding an Enumerator to a Custom Collection Class](#)

14

Lab

Using LINQ to Query Data

This module explains how to query in-memory data by using LINQ.

LESSONS

- Using the LINQ Extension Methods and Query Operators
- Building Dynamic LINQ Queries and Expressions

15

Lab

Integrating Visual C# Code with Dynamic Languages and COM Components

This module explains how to integrate code written by using a dynamic language such as Ruby and Python, and technologies such as COM, into a C# application

LESSONS

Integrating C# Code with Ruby and Python · Accessing COM Components from C#

HANDS-ON LABS

Practise What You Learn

#	MODULE	ACTIVITY
01	Introducing C# and the .NET Framework	Introducing C# and the .NET Framework
02	Using C# Programming Constructs	Using C# Programming Constructs
03	Declaring and Calling Methods	Declaring and Calling Methods
04	Handling Exceptions	Handling Exceptions
05	Reading and Writing Files	Reading and Writing Files
06	Creating New Types	Creating New Types
07	Encapsulating Data and Methods	Encapsulating Data and Methods
08	Inheriting From Classes and Implementing Interfaces	Inheriting From Classes and Implementing Interfaces
09	Managing the Lifetime of Objects and Controlling Resources	Managing the Lifetime of Objects and Controlling Resources

#	MODULE	ACTIVITY
10	Encapsulating Data and Defining Overloaded Operators	■ Creating and Using Properties ■ Creating and Using Indexers ■ Overloading Operators
11	Decoupling Methods and Handling Events	Decoupling Methods and Handling Events
12	Using Collections and Building Generic Types	■ Using Collections ■ Building Generic Types
13	Building and Enumerating Custom Collection Classes	Building and Enumerating Custom Collection Classes
14	Using LINQ to Query Data	Using LINQ to Query Data
15	Integrating Visual C# Code with Dynamic Languages and COM Components	Integrating C# Code with Dynamic Languages and COM Components

WHAT IS INCLUDED

Everything You Need to Succeed

- Koenig course material for every module
- Hands-on exercises throughout the course
- Delivery by certified instructors and subject matter experts
- Course completion certificate from Koenig

Who We Are

Established in 1993, Koenig Solutions is a globally recognised training provider with 35+ technology partnerships, 5,000+ training programmes and a network of certified instructors and subject matter experts, supporting individuals and enterprise teams worldwide.

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