

Programming with C# Language I

Course code: GOC2124

This course is designed for all programmers who want to gain basic knowledge and skills in creating applications in C# on the Microsoft .NET platform. In this course, you will learn how to use variables and value data types, program blocks, conditions and loops, work with arrays and collections, handle exceptions, register for events, use GIT, Nuget and publish applications, and learn the basics of object-oriented programming. This course is not suitable for complete beginners who have never programmed in any programming language; a minimum knowledge of algorithmization and programming at the level of the PRG course is recommended, or experience programming in another language.

What we will teach you

- An overview of the Microsoft .NET platform
- Variables and value data types
- Using program blocks, conditions, and loops
- Work with arrays and collections
- Exception handling
- Fundamentals of object-oriented programming
- Register for events
- Use source control with GIT
- Use Nuget and publish an application

Prerequisite skills

- Basic knowledge of algorithmization and programming at the level of the PRG course, or experience programming in another language.
- Course is not suitable for complete beginners who have never programmed in any programming language

Course outline

Overview of the Microsoft .NET platform

- Introduction
- Overview of Microsoft .NET
- Common Language Runtime
- Namespaces

C# Overview

- Basic code writing and syntax rules
- Program structure in C#
- Basic I/O operations
- Writing comments and XML documentation
- Compiling a program

Using the development environment

- Setting up a project
- Keyboard shortcuts
- Using code snippets
- Setting up the project

Variables and data types

- Generic type system
- Variable naming
- Using basic data types
- Implicit variable declarations
- User data types Enum and Struct
- Data type conversion

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Program blocks

- Program branching
- if
- switch
- conditional operator
- Iteration
- while
- do..while
- for

Functions

- Using functions
- Using parameters
- Return values
- Output parameters
- Optional and named parameters
- Recursion
- Overloading

Arrays and collections

- Arrays
- Array declarations
- Creating a one-dimensional array
- Creating a multidimensional array
- Using a foreach loop
- Array as return value of function
- Array as function parameter
- Collection
- Basics of using ArrayList and List<> collections
- Adding and removing elements
- String as a collection
- Using Split and Join
- Using the StringBuilder class

Error Handling and Debugging

- Exception handling
- Debugging

Object Oriented Programming Basics

- Using reference types
- Null value and handling Null Reference Exception
- Object classes and their instances
- Private and public members
- Using the this keyword
- Properties
- Static members
- Use of default and overloaded constructor
- Principle of inheritance, abstract classes and interface
- Event registration

Introduction to working with resources

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- Resource allocation and deallocation
- Try finally / Using statement
- Using Text Files

Versioning, package management and application publishing

- Introduction to the Git versioning system in Visual Studio
- Introduction to NuGet
- Finding and installing packages using NuGet Package Manager
- Introduction to application publishing
- C# publishing options: self-contained vs. framework-dependent deployment
- Publishing an application using Visual Studio (the "Publish" wizard)
- Selecting the target platform (e.g. Windows, Linux, macOS)

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