

Programming with C# Language II

Course code: GOC2125

The course is intended for all programmers who already have basic experience with programming in the C# language and want to acquire additional broader and practical knowledge and skills. In the course, you will learn to use modern extensions of the C# language, generic data types, delegates, events, extension methods, tuples, deconstruction, anonymous methods, lambda expressions, LINQ, attributes, but also records or, for example, compiler directives. You will also understand how memory management works with the Garbage Collector and learn to use compiler directives and Attributes, but many other interesting topics will be discussed. The course assumes basic knowledge of C# programming at least in the scope of the course [GOC2124].

Affiliate	Duration	Course price	ITB
Praha	5	23 000 Kč	50
Brno	5	23 000 Kč	50
Bratislava	5	1 000 €	50

The prices are without VAT.

Course terms

Date	Duration	Course price	Type	Course language	Location
03.02.2025	5	1 000 €	Presence	CZ/SK	Gopas Bratislava Prezenční
G 03.03.2025	5	23 000 Kč	Presence	CZ/SK	Gopas Praha Prezenční
07.04.2025	5	23 000 Kč	Presence	CZ/SK	Gopas Brno Prezenční
05.05.2025	5	23 000 Kč	Online	CZ/SK	Gopas Praha Online
26.05.2025	5	1 000 €	Presence	CZ/SK	Gopas Bratislava Prezenční
02.06.2025	5	23 000 Kč	Presence	CZ/SK	Gopas Praha Prezenční
30.06.2025	5	1 000 €	Presence	CZ/SK	Gopas Bratislava Prezenční

The prices are without VAT.

What we will teach you

- A brief overview of the .Net platform and the C# language
- Brief recap of PPE
- Generic data types
- Selected language extensions of the latest versions
- Delegates, Lambda expressions and LINQ
- Compiler Directives, Attributes and Assemblies
- Memory and Resource Management and Garbage Collector
- Reading and writing data using streams. Using CryptoStream.
- Data serialization
- Basics of asynchronous programming

Required entry skills

- The course assumes knowledge and experience with programming in the C# language at the level of the GOC2124 course
- The course can be taken without prior knowledge of c# and the .Net platform, but in that case a very good programming knowledge of other platforms and languages such as Java or C++ is required.

Teaching methods

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Programming with C# Language II

- Expert interpretation with practical examples, exercises on computers.

Studying materials

- Printed presentations of the discussed material.

Course outline

A brief overview of the .Net platform and the C# language

- Overview of the .Net platform
- Basic command line tools
- A brief overview of the basic concepts of PPE
- Class and static members
- Inheritance and polymorphism
- Virtual methods and shading
- Interface

Generic data types

- Generic types and type safety
- Generic classes
- Generic interface
- Generic methods
- Generic collections

Operator overloading

- Introduction to overloading operators
- Implicit and explicit overloading

Delegates and events

- Definition and use of delegates
- Callback usage
- Using events

An extension of the language of previous versions

- Keyword "var"
- Partial Classes
- Nullable Types and Operators ??, ?, ?[
- Automatic properties
- Tuples
- Discards, Out variables, Deconstructions
- Extension methods
- Optional and named parameters
- Object Initializers

Delegates Lambda expressions and LINQ

- Anonymous types
- Lambda expressions
- Generic delegates
- IEnumerable and IQueryable
- Closure
- Covariance and Contravariance

Pattern Matching

- Pattern Matching Overview
- Switch Pattern Matching
- Is Pattern Matching

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- Switch Pattern Expression and Expression Bodies

Records

- Introduction to Records
- Mutability
- Value Equality

Assemblies and attributes

- Compiler directives and conditional compilation
- Assemblies and the use of attributes

Memory and Resource Management and Garbage Collector

- Garbage Collector
- Implicit and Explicit release of resources
- Interface IDisposable
- Using and IDisposable
- Weak references
- Generation

Reading and writing data using streams

- Introduction to streams
- Using the FileStream class
- BinaryReader and BinaryWriter
- StreamReader and StreamWriter
- Using the FileInfo class
- Using the FileSystemWatcher class
- Using the CryptoStream class

Data serialization

- Introduction to serialization
- Shallow and deep serialization
- XML serialization
- Serialization Binary
- JSON serialization

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