Programming with C# Language I

Course code: GOC2124

The course is intended for all programmers who want to gain knowledge and skills in creating applications in the C# language on the Microsoft .NET platform. The course provides an overview of the Microsoft .NET platform and its Microsoft Visual Studio .NET development environment. You will get to know the C# language with an emphasis on the basics of the language itself and an introduction to object-oriented programming. The course is not suitable for complete beginners who have never programmed in any programming language, basic knowledge of algorithms and programming at the level of the course [PRG], or experience with programming in another language is recommended.

What we will teach you
- Overview of the Microsoft .NET platform
- Variables and value data types
- Use of program blocks, conditions and cycles
- Exception handling
- Basics of object-oriented programming
- Working with reference types
- Constructors, finalizers and freeing resources
- Inheritance, virtual methods, abstract classes and Interface
- Register for events
- Use properties and indexers

Required entry skills
- Basic knowledge of algorithms and programming at the level of the PRG course, or experience with programming in another language.
- The course is not suitable for complete beginners who have never programmed in any programming language

Course outline
An overview of the Microsoft .NET platform
- Introduction
- Overview of Microsoft .NET
- Common Language Runtime
- Namespaces

C# Overview
- Program structure in C#
- Basic I/O operations
- Recommended practices
- Program compilation and debugging

Variables and data types
- General type system
- Naming variables
- Use of basic data types
- User data types
- Data type conversion

Program blocks
- Program branching
- Iteration

Methods and parameters
- Use of methods
- Using parameters

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- Input, output parameters and parameters sold by reference
- Overloading
- Optional parameters and parameter fields

Field
- Field declaration
- Create a one-dimensional array
- Create a multidimensional array
- Difference between array and collection
- Basics of using ArrayList and List<> collections

Error Handling and Debugging
- Work with exceptions
- Debugging

Basics of object-oriented programming
- Object classes and their instances
- Private and public members
- Using this
- Static members

Properties and Indexers
- Using properties

Reference types
- Use of references
- Object hierarchies

Creating and destroying objects
- Object constructors and initialization
- Object destruction and Garbage Collector

Basics of heredity
- Inheritance and derivation of object classes
- Polymorphism
- Virtual methods
- Conversion of data types, retyping/casting
- Boxing/UnBoxing
- Interface implementation

Delegates and events
- EventHandler delegate
- Event registration

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