

C#.net Programming

- Audience:** All developers requiring the skills to develop in Microsofts C# language.
- Prerequisites:** An understanding of programming and the system development process. Knowledge of OO would be useful but is not essential as the course will cover the key concepts of OO.
- Objectives:** This course will introduce the attendees to C#, the Microsoft, standards based, Object Oriented (OO) language that is a cornerstone of Microsoft's .net range. The course will cover, in depth, the syntax and structure of C#. In addition, it will give an overview of the .net initiative and explain the key concepts of OO. C# is a major player in the OO development world. C# is one of the languages supported in the latest release of Microsoft's IDE (Integrated Development Environment) Visual Studio. C# programs can also be developed outside of the .net environment.
At the end of the course, the attendees will understand:
- .net, the .net Framework, and the role C# plays in .net
 - The key concepts of Object Orientation
 - The structure of a C# program
 - The difference and usage of value and reference types
 - Fields and variables
 - How to compile a C# program and the compiler options
 - How namespaces are used to create a hierarchy of classes
 - How to build loops and control logic in C#
 - How C# implements classes, inheritance, polymorphism
 - How to implement Methods in C#
 - The usage of the abstract, virtual, override and new modifiers
 - The role of access modifiers
 - The difference between ref, out, and params when passing parameters to a method
 - The use of the base and this keywords in methods

- How to implement method and operator overloading
- The purpose and advantages offered by properties and indexers
- The difference between static and non-static
- The use of static methods and fields
- The functionality offered via constructors
- How to implement multiple constructors on a single class
- The difference between Classes and Structs and where they should be used
- How to handle exceptions
- The role of delegates and events
- How to build multithreaded programs

Duration: 5 days. Hands on.

Course Content

Introduction

What is .net?
 What are C# and MSIL?
 Introduction to Visual Studio
 .NET SDK and tools

C# Fundamentals

Console I/O
 Simple "Hello World!" program
 Comments and documenting
 Common language runtime
 Base class library
 Namespaces

Type Hierarchy

Object and basic types
 References and values
 Boxing

Classes vs Structures

Constructors
 Fields and methods
 Overloading
 static and constant
 public private protected sealed
 Properties and Indexers
 Destructors
 Garbage collection

Iteration and Flow of Control

Relational operators
 Collections (ArrayList, HashTable)
 for and foreach loops
 while and do-while loops
 Conditional expression
 Switch statement

Arrays

Initialisation
Accessing an arrays
Multi-Dimensioned arrays

Exception Handling

Exceptions
try...catch
try...finally
Throwing exceptions

Inheritance - Polymorphism

Virtual methods
Abstract methods
Override methods

Interfaces

Defining Interfaces
Implementing interfaces
IComparable, ICloneable

C# Event Model

Delegates and events
Streams
FileStream
StreamReader
StreamWriter
WinForms
Simple Windows application
Event handling

Threading Support

Threads and synchronization

Performance in C#

Writing code to maximize performance

Raw access
unsafe and fixed

Reflection

Querying for type information
AppDomain

Interoperability

With Win32
With COM
With other .NET modules

Assemblies

Private vs Shared
Strong Names
Versioning

How it fits together

Accessing databases
ADO.NET, ASP.Net
and WebServices

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