



C# Training

Dot Net

Version 1.1

Abstract

C# Training Pathway



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1 Introduction to document

C# is a strongly typed object-oriented programming language. C# can be used to develop web applications and has become increasingly popular for mobile development too. This course is intended to help you learn the C# programming language and help you write efficient, readable, and modular code following the industry best practices.

1.1 Intended audience

The intended target group for this document are:

- Trainee
- Junior Associate

2 Pre-requisite

Basic knowledge of any programming language.

3 Course Material

3.1 .Net Ecosystem and introduction to C#

- .Net Framework, .Net Standard and .Net Core
- Setting up development environment
- C#- Hello World
- Data types, strings, Enums and Functions
- Conditional flow
- Reference and value types
- Out, ref and params key word

Topic	Link	Hours
.Net Ecosystem (.Net Framework, standard and core)	<ul style="list-style-type: none"> • https://www.youtube.com/watch?v=bEfBfBQq7EE • https://dzone.com/articles/a-brief-walk-through-net-ecosystem • https://dotnet.microsoft.com/learn/dotnet/what-is-dotnet • https://docs.microsoft.com/en-us/dotnet/standard/common-type-system 	
Visual Studio 2019, VS Code, C# (Hello World)	<ul style="list-style-type: none"> • C# Tutorial For Beginners - Learn C# Basics in 1 Hour - YouTube • https://www.youtube.com/watch?v=gfkTfcpWgAY&list=PLTjRvDozrdIz3 FPXwb6IX HoGXa09Yef • https://code.visualstudio.com/docs/introvideos/basics • https://docs.microsoft.com/en-us/visualstudio/get-started/visual-studio-ide?view=vs-2019 • https://www.tutorialsteacher.com/csharp/first-csharp-program 	
Data types, strings, Enums, Functions, Variables	<ul style="list-style-type: none"> • https://www.tutlane.com/tutorial/csharp/csharp-data-types-with-examples • https://www.tutorialsteacher.com/csharp/csharp-enum • https://www.c-sharpcorner.com/article/string-in-C-Sharp/ • https://www.tutorialspoint.com/csharp/csharp_methods.htm • https://www.tutorialsteacher.com/csharp/csharp-variable • https://www.tutorialsteacher.com/csharp/csharp-data-types • https://www.tutorialsteacher.com/csharp/csharp-var-implicit-typed-local-variable • https://www.tutorialsteacher.com/csharp/array-csharp 	
Conditional Flow	<ul style="list-style-type: none"> • https://www.dreamincode.net/forums/topic/220356-control-structures-loops-ifs-and-switch/ • https://www.tutorialsteacher.com/csharp/csharp-if-else • https://www.tutorialsteacher.com/csharp/csharp-ternary-operator • https://www.tutorialsteacher.com/csharp/csharp-switch • https://www.tutorialsteacher.com/csharp/csharp-for-loop • https://www.tutorialsteacher.com/csharp/csharp-while-loop • https://www.tutorialsteacher.com/csharp/csharp-do-while-loop 	
Value and reference types	<ul style="list-style-type: none"> • https://www.tutlane.com/tutorial/csharp/csharp-value-type-and-reference-type-with-examples • https://www.youtube.com/watch?v=mvieNUE9Urs 	

	<ul style="list-style-type: none"> • https://www.tutorialsteacher.com/csharp/csharp-value-type-and-reference-type 	
Out, ref and params keywords	<ul style="list-style-type: none"> • https://www.youtube.com/watch?v=lydcY5zulXA • https://www.tutorialsteacher.com/articles/ref-keyword • https://www.tutorialsteacher.com/articles/out-keyword-in-csharp 	

3.1.1 References

Topic	Link
Book (chapter 1-5)	<ul style="list-style-type: none"> • https://memberfiles.freewebs.com/02/83/78118302/documents/McGraw.Hill.CSharp.4.0.The.Complete.Reference.Apr.2010.pdf

3.2 Introduction to Object oriented programming

- C# Classes and Objects
- Constructor
- Pass by value and reference
- OOPs
- SOLID principles
- Method overloading and riding
- Inheritance and polymorphism
- Indexer and properties
- Static, this, abstract and virtual keyword

Topic	Link	Hours
Classes	<ul style="list-style-type: none"> • https://www.youtube.com/watch?v=ZqDtPfrUonQ • https://www.tutorialsteacher.com/csharp/csharp-class 	
C# Access Modifiers and Constructor	<ul style="list-style-type: none"> • https://www.youtube.com/watch?v=TxOmmJTd98 • https://www.youtube.com/watch?v=q7aWkjH3UUI 	
C# Inheritance and Polymorphism	<ul style="list-style-type: none"> • https://www.youtube.com/watch?v=snJde1j9SLo • https://www.c-sharpcorner.com/UploadFile/ff2f08/understanding-polymorphism-in-C-Sharp/ 	
C# Abstract classes and Interfaces	<ul style="list-style-type: none"> • https://www.youtube.com/watch?v=aQ8YkjrAbzE • https://www.youtube.com/watch?v=7amjs2y_dgo 	
this, static, virtual, abstract	<ul style="list-style-type: none"> • https://docs.microsoft.com/en-us/dotnet/csharp/language-reference/keywords/this • https://www.c-sharpcorner.com/UploadFile/36bc15/static-keyword-in-C-Sharp/ 	

	<ul style="list-style-type: none"> • https://www.tutorialsteacher.com/csharp/csharp-static • https://www.dotnettricks.com/learn/csharp/understanding-virtual-override-and-new-keyword-in-csharp 	
Solid Principles	<ul style="list-style-type: none"> • https://www.youtube.com/watch?v=yxf2spbpTSw • https://www.youtube.com/watch?v=9qvCeRt9_hM • http://www.blackwasp.co.uk/SOLID.aspx 	

3.2.1 References

Topic	Link
Book (chapter 6, 7, 8, 10, 11, 12)	<ul style="list-style-type: none"> • https://memberfiles.freewebs.com/02/83/78118302/documents/McGraw.Hill.CSharp.4.0.The.Complete.Reference.Apr.2010.pdf

3.3 Exceptional handling, File I/O, Garbage collection and Nullable types

- Try, Catch and Final Keyword
- Throw and re-throw
- Custom Exceptions
- File I/O
- Garbage Collection process

Topic	Link	Hours
Exception handling	<ul style="list-style-type: none"> • https://docs.microsoft.com/en-us/dotnet/csharp/programming-guide/exceptions/using-exceptions • https://docs.microsoft.com/en-us/dotnet/csharp/programming-guide/exceptions/exception-handling • https://docs.microsoft.com/en-us/dotnet/csharp/programming-guide/exceptions/creating-and-throwing-exceptions • https://www.youtube.com/watch?v=9jmA0UO45-Q • https://www.tutorialsteacher.com/csharp/csharp-exception 	
File I/O	<ul style="list-style-type: none"> • https://www.youtube.com/watch?v=HKqMqFJr4SY 	
Garbage Collection	<ul style="list-style-type: none"> • https://docs.microsoft.com/en-us/dotnet/standard/garbage-collection/fundamentals • https://www.c-sharpcorner.com/article/C-Sharp-heaping-vs-stacking-in-net-part-i/ 	
Nullable type	<ul style="list-style-type: none"> • https://app.pluralsight.com/library/courses/working-with-nulls-csharp/table-of-contents 	

	<ul style="list-style-type: none"> https://www.youtube.com/watch?v=HuLJbiqpIM0 	
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3.3.1 References

Topic	Link
Book (chapter 13, 14, 20)	<ul style="list-style-type: none"> https://memberfiles.freewebs.com/02/83/78118302/documents/McGraw.Hill.CSharp.4.0.The.Complete.Reference.Apr.2010.pdf

3.4 Collection, Generics, Reflection and LINQ

- Collections – Array, List, Dictionary, Concurrent Collections
- Generic Classes, interfaces, and methods
- LINQ
- Reflection

Topic	Link	Hours
Collections and Generics	<ul style="list-style-type: none"> https://www.youtube.com/watch?v=1tZuJRFaNPw https://www.youtube.com/watch?v=2inKli6Z_zl https://www.youtube.com/watch?v=-vjQ3gW3Dd8 https://www.youtube.com/watch?v=gyl6TbgmSU&t=5s https://www.tutorialsteacher.com/csharp/csharp-collection https://www.tutorialsteacher.com/csharp/csharp-generics 	
Enumerators and IEnumerable	<ul style="list-style-type: none"> https://www.youtube.com/watch?v=jd3yUjGc9M0&t=679s 	
LINQ and Lambda Expressions	<ul style="list-style-type: none"> https://www.youtube.com/watch?v=gwD9awr3NNo&t=397s https://www.tutorialsteacher.com/linq/linq-tutorials 	
Reflection	<ul style="list-style-type: none"> https://docs.microsoft.com/en-us/dotnet/csharp/programming-guide/concepts/reflection https://docs.microsoft.com/en-us/dotnet/framework/reflection-and-codedom/reflection https://docs.microsoft.com/en-us/dotnet/framework/reflection-and-codedom/viewing-type-information 	

3.4.1 References

Topic	Link
Book (chapter 17, 18, 19, 25)	<ul style="list-style-type: none"> https://memberfiles.freewebs.com/02/83/78118302/documents/McGraw.Hill.CSharp.4.0.The.Complete.Reference.Apr.2010.pdf

3.5 Events, Delegates and Lambda

- Events and Delegates
- Anonymous Delegates
- Extension Methods

Topic	Link	Hours
Events, Delegates and Lambda	<ul style="list-style-type: none"> • https://www.youtube.com/watch?v=jQgwEsJISy0&t=27s • https://www.tutorialsteacher.com/csharp/csharp-delegates • https://www.tutorialsteacher.com/csharp/csharp-event 	
Extension Methods	<ul style="list-style-type: none"> • https://www.tutorialsteacher.com/csharp/csharp-extension-method 	

3.5.1 References

Topic	Link
Book (chapter 15)	<ul style="list-style-type: none"> • https://memberfiles.freewebs.com/02/83/78118302/documents/McGraw.Hill.CSharp.4.0.The.Complete.Reference.Apr.2010.pdf

3.6 Threading and Async Programming

- Thread, Process and Task
- Task parallel library
- Async and await

Topic	Link	Hours
Threads	<ul style="list-style-type: none"> • https://docs.microsoft.com/en-us/dotnet/standard/threading/threads-and-threading • https://www.javatpoint.com/c-sharp-multithreading 	
Asynchronous Programming	<ul style="list-style-type: none"> • https://www.youtube.com/watch?v=2moh18sh5p4 	

3.6.1 References

Topic	Link
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Book (chapter 23 and 24)	<ul style="list-style-type: none">• https://memberfiles.freewebs.com/02/83/78118302/documents/McGraw.Hill.CSharp.4.0.The.Complete.Reference.Apr.2010.pdf
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3.7 Inversion of Control

- Dependency Injection
- IoC Container
- Unity Container

Topic	Link	Hours
IoC	<ul style="list-style-type: none">• https://www.tutorialsteacher.com/ioc	

3.8 Bonus: C# new features

Topic	Link	Hours
C# 7	<ul style="list-style-type: none">• https://docs.microsoft.com/en-us/dotnet/csharp/whats-new/csharp-7	
C# 8	<ul style="list-style-type: none">• https://docs.microsoft.com/en-us/dotnet/csharp/whats-new/csharp-8	
C# 9	<ul style="list-style-type: none">• https://docs.microsoft.com/en-us/dotnet/csharp/whats-new/csharp-9	