

BACKEND DEVELOPMENT

Become a Backend developer
with .Net

4 Month Curriculum (MICRO DIPLOMA)



SYLLABUS

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COURSE TITLE: BACK END DEVELOPMENT (.NET)

DURATION: 4 MONTHS

C# Back to Basis

C#(pronounced “C-sharp”) is a general-purpose, object-oriented programming language developed by Microsoft. It is the part of the .NET family of languages and is used to build a wide range of applications, from web and mobile applications to games and cloud services.

C# is a statically-typed language, which means that the type of a variable must be specified when it is declared and that the type of a value cannot be changed after it has been assigned. C# also supports object-oriented programming, which means that it provides features such as encapsulation, inheritance, and polymorphism.

C# is a popular language for building .NET applications, and it is used by many large companies and organisations, including Microsoft, Dell, and IBM. It is a versatile language that can be used for a wide range of purposes, and it is well-suited for building scalable and maintainable software systems.

WEEK 1 C#: INTRODUCTION AND C# BASIS

- Introduction to c# and the .NET Platform
- Development Environment Setup
- Variables and Data Types
- The Var Keyword
- Comments
- Arithmetic Operators in C#
- Type Conversion
- Working with Strings
- Bracket Notation & Escape Character Sequences
- String Methods
- Working with Numbers & Number/Math Methods
- Handling Input and Output

WEEK 2 C#: LOGIC, CONTROL FLOW, AND CONDITIONALS

- Logical Operators
- Comparison Operators
- AND, OR, and NOT operators (Truth Table)
- Control Flow
- if, if-Else, Else Statements
- Ternary Operator
- Switch Statements
- Break Keyword

WEEK 3 C#: METHODS

- Method Declaration
- Variable inside Methods
- Parameters (Optional and Required)
- Void Return Type
- Return Keyword
- Method Overloading
- Out Parameters

WEEK 4 C#: ARRAYS AND LOOPS

- Declaring and Initializing arrays
- Access array element
- Common array methods
- Array Length Properties
- Multi-dimensional arrays
- For Loop and For Each Loop
- While Loop and Do While Loop
- Infinite Loop, Break, and Continue Statements

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WEEK 5 C#: WORKING WITH FILES AND HANDLING EXCEPTIONS

- Stream Writer and Stream Reader
- File, and Directory
- What is Exception
- Try, Catch, Throw, and Finally
- Specific Exceptions

WEEK 6 C# OOP CONCEPTS - CLASSES AND OBJECTS

- Classes
- Class Fields
- Access Modifiers
- Constructors (Parameterless Constructor) and this keyword
- Object/Class Instance
- Properties and auto-implemented Property
- Static Classes and Members, Constants
- Structures
- Enumerations
- Namespaces

WEEK 7 C# OOP CONCEPTS - CLASSES AND OBJECTS

- Interfaces
- Inheritance
- Protected Keyword
- Override/virtual keywords
- Polymorphism
- Abstract Classes and Members
- Generic List and Dictionary

WEEK 8 C# REFERENCE AND VALUE TYPES

- Reference Types
- Upcasting and Downcasting
- Null Reference
- Value Types
- Comparison Type (==)
- Empty String
- Object Class
- Object Class Methods: ToString, Equals

WEEK 9 C# LISTS AND LINQ 1

- Lists in C#
- Object Initialization
- Limitless Lists
- Count Property
- List methods: Remove, Clear, Contains
- List Ranges: AddRange, InsertRange, RemoveRange
- Using LINQ
- Writing LINQ: Method & Query Syntax

WEEK 10 GETTING STARTED: ASP.NET CORE MVC

- ASP.NET MVC project templates
- Understanding the ASP.NET MVC project structure
- Understanding the MVC Architecture(Model, View, Controller)
- ASP.NET Core Middleware:
- Understanding ASP.NET Middleware
- ASP.NET Middleware Order
- Custom middleware
- Developer Exception Pages
- Serving Static Files

WEEK 11 ASP.NET CORE MVC: Controllers

- Controller Base Class
- Actions
- Retrieving Data From a Request
- Action Results
- Action Attributes
- Filters: Authorization, Action etc
- Dependency Injection

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WEEK 12 C#: ASP.NET CORE MVC: THE VIEW

- Understanding the View
- Using ViewBag and ViewData
- Using Dynamic Objects
- Html Helpers
- Form Submission, Action Selectors HttpGet, HttpPost, etc
- Model Binding
- Input Validation and Determining Valid Model State
- Validation Attributes

WEEK 13 C#: ASP.NET CORE MVC ROUTING

- Routing in ASP.NET Core MVC
- Properties of Routes
- Parameters in Routing
- Registering Routes
- Attribute Routing

WEEK 14 C# CORE DATABASES

- SQL Basics
- Introduction to ORM: Entity Framework Core
- Database Context
- Database Set Type
- App Settings and Configurations
- Creating Migrations

WEEK 15-16 C# ASP.NET CORE: NET CORE WEB API

- ASP.NET Core Web API
- Representational State Transfer
- REST and Web API
- HTTP Services Using Web API
- HTTP Response Codes
- Using Postman
- ASP.NET Web API Clients