



Curriculum Of C# & .Net Core

Duration: 3 Months

C#

MODULE 1: INTRODUCTION TO .NET FRAMEWORK

- What is a .Net Framework and its components?
- Different .Net Framework versions and their Dependency.
- The core of the .Net Framework and the Types of .Net Applications
- What are Base class Libraries and What is a Namespace
- How the Compilation process and Execution Process is done
- What is Portable Executable and its extensions?
- What is MSIL and Why MSIL instructions are Platform Independent Instructions
- What is Metadata and which type of Information does the Metadata Stores
- What is CLR and what are the Components in CLR

MODULE 2: C# LANGUAGE

- Data Types and declaring a Variable
- Value Type and Reference Type
- What is Implicit Casting & ExplicitCasting?
- Arrays
- Difference between string and string Builder
- What is Boxing/Unboxing
- What are constants and Enums
- Operators in C#
- If, while, do while, switch, For & Foreach
- Single dimension & multi dimension Array
- What is method overloading?
- Optional parameters
- What are Named Arguments?

- What is params Parameter?
- How to Pass argument by value, ref & out
- Enums

MODULE 3: COLLECTIONS & GENERICS

- What are the Types of collections
- What is IEnumerable, ICollection, IList, IDictionary?
- What is ArrayList, HashTable, SortedList, Queue, and Stack?
- How to iterate using IEnumerable
- How sort using IComparer and IComparable
- What are the advantages of Generics and how they work at runtime?
- What are Generic methods and Generic collection classes?
- What is List and Dictionary?

MODULE 4: ASSEMBLIES AND GAC

- What is difference between DLL and EXE
- How to build a class library
- How to use a Class Library in another Application
- What is Namespace?
- Types of Assemblies
- Global Assembly Cache

MODULE 5: IO STREAMS

- What is a Stream and Types of Streams?
- How Files can be handled using FileMode, FileAccess, FileShare
- What is Reader & Writer?
- How to work with File System
- What is Serialization and Deserialization?

MODULE 6: OOPS CONCEPT

- Introduction to OOPS and its principles



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- Class and Objects
- Introduction to Constructor
- Types of Constructors
- Constructor Overloading
- Properties
- Static variables and Non-Static variables
- Static methods and Non-static methods
- Static Constructor
- This keyword
- Encapsulation and Data abstraction
- Garbage collector
- Introduction to Inheritance
- Abstract class vs Interface

MODULE 7: EXTENDED C# LANGUAGE FEATURES

- What is the partial class, partial methods
- Delegate
- Generic Class
- Extension Methods
- Anonymous Types
- Lamda Expression
- Tuples
- String Interpolation
- Null Conditional Operator
- Auto Property Initializer
- Dictionary / Index Initializer
- Expression-bodied function members
- What is name of Expression
- Asyn & Await

MODULE 8: EXCEPTION HANDLING

- What is an Exception and types of Exceptions?
- How to handle Exception using try and catch blocks
- How to throw an Exception using throw and throw

- What is finally Block
- How to define custom Exception class

MODULE 9: MULTITHREADING

- Understanding multithreading process
- The System Threading Namespace
- The Thread and Thread Start Class
- Thread Life Cycle
- Thread Safety Concept
- Thread synchronization
- Understanding Thread pool
- Understanding Role of Thread Background Worker Component

.NET CORE

MODULE 1: HTML

- Introduction to HTML
- Heading Tag in HTML
- Html Basic Tag
- Anchor Tag
- Image Tag
- List in HTML
- Table Tag
- Form Tag

MODULE 2: CSS

- Introduction to CSS
- Types of CSS
- Selector in CSS
- Attributes in CSS

MODULE 3: JAVA SCRIPT

- Use of Java Script.
- Internal vs External Java Script
- Conditional Statements in JS
- Loop in JS, Functions in JS, Events in JS
- Local and Global variable in JS



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- Client-Side Validation in JS

MODULE 4: SQL SERVER

- Introduction to DBMS.
- Introduction to SQL Server
- Database Language
- Keys in SQL server
- Top/where/and/or/in/between/like/Group by/having/union/intersect
- Join in SQL
- Stored Procedure
- Views
- Trigger

MODULE 5 ASP .NET CORE

- Introduction.
- What is ASP .Net Core?
- ASP .Net Core Features
- Advantages of ASP. Net Core
- MVC Pattern
- Understanding ASP .Net Core MVC
- ASP .Net Core vs. ASP .Net MVC vs. ASP.Net Web Forms

MODULE 6: ASP.NET CORE FIRST APPLICATION

- ASP .Net Core Environment Setup
- ASP .Net Core First Application
- Project Layout
- Understanding Life Cycle of ASP .Net Core Request

MODULE 7: CONTROLLERS & ACTION METHODS

- Controllers Overview.
- Action Methods and IActionResult object
- Passing data from Controller to View
- Understanding Action Selectors

- Action Filters
- Building Custom Action Filters
- Middleware
- Asynchronous Action Methods

MODULE 8: HELPERS

- Introduction to View.
- Html Helpers
- Built-In Html Helpers
- URL helpers
- Tag Helpers
- Custom Tag Helpers

MODULE 9: MODEL BINDING

- Model Binder Overview
- DefaultModelBinder
- Binding to Complex Classes
- IFormCollection Model Binding
- IFormFile Model Binder
- Bind Attribute
- TryUpdateModelAsync

MODULE 10: VALIDATIONS & DATA ANNOTATIONS

- Data Annotation and Validations Overview
- Validations with Data Annotation
- Server Side and Client Side Validation
- Custom Server side validation
- Model level validation using IValidatableObject
- Remote Validation
- Anti-Forgery Tokens

MODULE 11: STATE MANAGEMENT TECHNIQUES

- View Data, View Bag
- Temp Data
- Sessions



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MODULE 12: SECURITY

- Authentication and Authorization
- Implementing Security using ASP.NET Core Identity
- Seeding Users and Roles
- OAuth implementation
- Social Sites Login

MODULE 13: ASP.NET CORE – WEB CACHING

- Cache Tag Helpers
- Memory Caching Introduction
- In-Memory Caching
- Response Cache
- Distributed Cache

MODULE 14: ROUTING

- URL Routing Overview
- Custom Routes
- Attribute Routing
- Routing Constraints

MODULE 15: MODULE DEVELOPMENT

- Understanding Areas
- Adding Areas
- Defining Area Routes
- Linking between Areas

MODULE 16: ENTITY FRAMEWORK CORE

- Entity Framework Requirements
- What is ORM?
- Data Base First Approach
- Code First Approach

- Model First Approach
- Basic CRUD Operations using Entity Framework
- Writing Generic Class / Repository
- Migrations
- Linq with EF

MODULE 17: WEB API AND JQUERY AJAX

- Introduction to Web API
- Restful Convention
- Building and Testing Web API
- AJAX implementation using JQuery
- Calling the Web API with JQuery Ajax
- Data Transfer Object
- Auto Mapper
- IActionResult
- Media Types
- Creating a Web API that Supports CRUD Operations using EF