DOT NET DEVELOPER SYLLABUS

1. Introduction to .NET

Overview of .NET Framework and .NET Core

Understanding the Common Language Runtime (CLR)

Introduction to .NET Standard

Differences between .NET Framework, .NET Core, and .NET 5/6

2. C# Fundamentals

Basics of C# programming

Data types, variables, and constants

Control structures (if, switch, loops)

Object-Oriented Programming (OOP) concepts

Classes and objects

Inheritance, polymorphism, encapsulation, and abstraction

Exception handling

Collections and Generics

3. Advanced C#

Delegates, Events, and Lambdas

LINQ (Language Integrated Query)

Asynchronous programming (async/await)

Reflection and Attributes

Memory management and Garbage Collection

4. .NET Libraries and Frameworks

Overview of .NET libraries (System, Collections, LINQ, etc.)

Understanding NuGet packages and package management

Working with JSON and XML

Introduction to Entity Framework Core (ORM)

ADO.NET for database access

5. ASP.NET Core

Introduction to ASP.NET Core MVC

Routing, Controllers, and Views

Razor Pages and Blazor

Middleware and Dependency Injection

Understanding RESTful services and Web API

Authentication and Authorization

Handling errors and logging

6. Frontend Technologies

Basics of HTML, CSS, and JavaScript

Client-side frameworks (React, Angular, or Vue.js)

Integrating front-end with ASP.NET Core applications

7. Databases

Relational databases (SQL Server, PostgreSQL)

Basic SQL queries, joins, and data manipulation

Entity Framework Core basics

Database migrations and seeding data

8. Testing and Debugging

Unit testing with xUnit or NUnit

Integration testing

Test-Driven Development (TDD) principles

Debugging techniques in Visual Studio

9. DevOps and Deployment

Version control with Git

Continuous Integration/Continuous Deployment (CI/CD)

Using Docker with .NET applications

Deployment options (IIS, Azure, AWS)

10. Cloud Services and Microservices

Introduction to cloud concepts

Building microservices with .NET

Using Azure services (Azure Functions, Azure App Services, etc.)

Understanding API gateways and service discovery

11. Security Best Practices

Secure coding practices

Protecting APIs with OAuth and JWT

Data protection and encryption

12. Performance Optimization

Profiling and monitoring applications

Caching strategies (MemoryCache, Redis)

Optimization techniques for database access

Additional Topics (Optional)

Real-time web applications with SignalR

GraphQL with .NET

Working with Azure DevOps

Introduction to Xamarin for mobile development

Practice Projects: Build personal projects, contribute to open-source, or create applications that solve real-world problems.

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