



Dot Net

SYLLABUS

Topics Covered

Introduction to .NET Framework

1. Overview of .NET Framework and .NET Core
 2. Common Language Runtime (CLR) and Framework Class Library (FCL)
 3. Understanding the .NET Development Environment
 4. Differences between .NET Framework, .NET Core, and .NET 5/6/7
- Installation and Setup of Visual Studio

C# Programming Fundamentals

1. Introduction to C# Language
2. Variables, Data Types, and Operators
3. Control Structures: Conditionals and Loops
4. Functions and Methods
5. Arrays and Collections (List, Dictionary)
6. Exception Handling
7. Object-Oriented Programming Concepts

Advanced C# Concepts

1. LINQ (Language Integrated Query)
2. Delegates and Events
3. Lambda Expressions
4. Extension Methods
5. Asynchronous Programming (async/await)
6. Working with Files and I/O

Introduction to ASP.NET Core

1. Overview of Web Development with ASP.NET Core
2. Setting up ASP.NET Core MVC Projects
3. Controllers, Views, and Models
4. Routing in ASP.NET Core
5. Dependency Injection in ASP.NET Core
6. Working with Razor Pages

Working with Databases

- 1.Introduction to Entity Framework Core
- 2.Database-first vs Code-first Approach
- 3.CRUD Operations with Entity Framework
- 4.Working with SQL Server
- 5.Database Migrations
- 6.LINQ Queries and Relationships (One-to-One, One-to-Many)

Web API Development

- 1.Introduction to RESTful Services
- 2.Creating Web APIs with ASP.NET Core
- 3.HTTP Verbs (GET, POST, PUT, DELETE)
- 4.Securing APIs with JWT (JSON Web Token)
- 5.Consuming Web APIs in Client Applications

Frontend Integration

- 1.Overview of Frontend Frameworks (React, Angular) with ASP.NET Core
- 2.Integrating ASP.NET Core with JavaScript, jQuery, and AJAX
- 3.Building Single-Page Applications (SPA) with Blazor

ASP.NET Core Security

- 1.Authentication and Authorization in ASP.NET Core
- 2.Role-based and Claim-based Security
- 3.Securing Web Applications with HTTPS
- 4.Preventing Cross-Site Scripting (XSS), Cross-Site Request Forgery (CSRF)

Deployment and Hosting

- 1.Introduction to Cloud Hosting (Azure, AWS)
- 2.Deploying ASP.NET Core Applications to IIS and Azure
- 3.Containerization using Docker with ASP.NET Core
- 4.Version Control with Git and GitHub

Unit Testing and Debugging

- 1.Introduction to Unit Testing in .NET
- 2.Writing Unit Tests using xUnit and NUnit
- 3.Debugging Techniques in Visual Studio
- 4.Test-Driven Development (TDD)

.NET Core and Microservices

- 1.Introduction to Microservices Architecture
- 2.Building Microservices with ASP.NET Core
- 3.Working with gRPC
- 4.Service Discovery and Load Balancing

.NET Best Practices

- 1.Coding Standards and Best Practices
- 2.Design Patterns in .NET (Singleton, Factory, Repository)
- 3.Clean Architecture and Dependency Injection
- 4.Performance Optimization Techniques in .NET Applications

Final Project

- 1.Building a Full-Stack Application using ASP.NET Core and Entity Framework
- 2.Integrating Frontend Framework (React or Angular) with the .NET Backend
- 3.Implementing Security and API Integrations
- 4.Deploying the Application to Azure/AWS

JEEVI ACADEMY