



Module 1: C# Basics to Advanced

Introduction to C

- Overview of .NET Framework and .NET Core
- Understanding CLR, CTS, and CLS
- Writing your first C# program

Core Concepts

- Variables, Data Types, and Operators
- Control Statements (If-else, Loops, Switch)
- Arrays, Strings, and Collections

Object-Oriented Programming (OOP)

- Classes, Objects, and Methods
- Encapsulation, Inheritance, Polymorphism, and Abstraction
- Access Modifiers

Advanced C#

- Delegates and Events
- Exception Handling
- Generics and Indexers
- Anonymous Types and Lambda Expressions
- LINQ (Language Integrated Query)
- Reflection

Module 2: ASP.NET (Web Forms)

Introduction to ASP.NET

- Architecture of ASP.NET Applications
- Web Forms: Overview and Lifecycle
- Creating ASP.NET Web Applications



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Working with Web Controls

- Standard Controls
- Validation Controls
- Master Pages and Themes

State Management

- View State, Cookies, Query Strings
- Session and Application State

Module 3: ADO.NET

Introduction to ADO.NET

- ADO.NET Architecture
- Connection, Command, Data Reader, and Data Adapter
- Using DataSets and DataTables

Database Operations

- Performing CRUD Operations
- Using Stored Procedures
- Managing Transaction

Module 4: ASP.NET MVC

Introduction to MVC Architecture

- Understanding Model, View, and Controller
- Creating a Simple MVC Application



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Razor View Engine

- Razor Syntax and Layouts
- Working with Partial Views and Strongly Typed Views

Controller Features

- Action Methods and Action Results
- Routing in MVC

Data Handling

- Entity Framework Integration
- LINQ Queries in MVC
- Validation Techniques

State Management in MVC

- TempData, ViewData, and ViewBag

Module 5: ASP.NET Core

Introduction to .NET Core

- Differences between .NET Framework and .NET Core
- Setting up .NET Core Development Environment
- Building Cross-Platform Applications

ASP.NET Core MVC

- Creating a Web Application using ASP.NET Core
- Dependency Injection in ASP.NET Core
- Middleware and Request Pipeline



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Entity Framework Core

- Code-First and Database-First Approaches
- Migrations and Relationships
- Querying and Updating Data

Security

- Authentication and Authorization in ASP.NET Core
 - Identity Framework in ASP.NET Core
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Module 6: Web API Development

Introduction to Web API

- What is Web API? When to use it?
- RESTful Services Overview

Building Web APIs

- Creating Web API Controllers
- Routing and Action Selection

Data Formatting

- JSON and XML Serialization
- Content Negotiation

Advanced Features

- Versioning in Web API
- Securing APIs with JWT
- Consuming Web APIs in Applications



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Module 7: Frontend Technologies

HTML, CSS, and JavaScript Basics

- Building Static Web Pages
- CSS for Styling and Responsive Design
- Bootstrap Framework for Layout and Components

Integration with ASP.NET

- Using HTML Forms in ASP.NET Applications
- Client-Side Validation with JavaScript and jQuery

Module 8: Advanced .NET

Entity Framework (EF)

- Overview of EF
- Using LINQ with EF
- Optimizing EF Queries

Reflection in .NET

- Introduction to Reflection
- Dynamic Loading of Assemblies
- Working with Attributes and Metadata

Dependency Injection

- Understanding Dependency Injection
- Implementing DI in ASP.NET Core



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Performance Optimization

- Caching in ASP.NET
- Best Practices for High-Performance Applications

Module 9: Capstone Project

Developing a Full Stack Application

- Designing the Database
- Implementing Backend Logic (Web API or MVC)
- Creating a Responsive Frontend
- Integrating and Testing the Application

Deployment

- Hosting on IIS or Kestrel
- Publishing on Cloud Platforms (Azure, AWS)



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