

ASP.NET using C#

Course Duration

- **Total Duration:** 80–100 Hours
- **Theory:** 35%
- **Practical / Lab:** 65%

Prerequisites

- Basic Computer Fundamentals
- Programming Fundamentals (C / Java / Python helpful)
- Basic HTML & CSS knowledge

Module 1: Introduction to .NET Framework & C# (8 Hours)

- Introduction to .NET Platform
- CLR (Common Language Runtime)
- CTS & CLS
- .NET Framework vs .NET Core / .NET
- Visual Studio IDE Overview
- Introduction to C#
- Structure of C# Program
- Data Types & Variables
- Keywords & Identifiers

Module 2: C# Language Fundamentals (10 Hours)

- Operators
- Control Statements
 - if, switch
 - for, while, do-while
- Arrays & Strings
- Methods & Method Overloading
- Value Types vs Reference Types
- Nullable Types

Module 3: Object-Oriented Programming in C# (10 Hours)

- Classes & Objects
- Constructors & Destructors
- Inheritance
- Polymorphism
- Encapsulation
- Abstraction
- Interfaces
- Abstract Classes
- Properties

- this & base keywords

Module 4: Exception Handling & File Handling (6 Hours)

- Types of Exceptions
- try, catch, finally
- Custom Exceptions
- File Handling using System.IO
- Reading & Writing Files
- Serialization & Deserialization

Module 5: ASP.NET Overview (6 Hours)

- What is ASP.NET?
- ASP.NET Web Forms vs MVC vs Core
- Web Application Architecture
- Request–Response Lifecycle
- IIS Overview

Module 6: ASP.NET Web Forms (10 Hours)

- Web Forms Architecture
- Web Controls
 - Standard Controls
 - Validation Controls
- ViewState
- PostBack
- Master Pages
- User Controls
- State Management
 - Session
 - Cookies
 - Application State

Module 7: ASP.NET MVC (12 Hours)

- MVC Architecture
- Controllers
- Models
- Views (Razor Syntax)
- Routing
- Layout Pages
- Partial Views
- HTML Helpers
- Model Binding
- Validation

Module 8: Database Access using ADO.NET & Entity Framework (12 Hours)

- ADO.NET Architecture
- Connected & Disconnected Architecture
- DataReader, DataSet
- SQL Server Integration
- CRUD Operations
- Entity Framework (Code First / Database First)
- LINQ Basics

Module 9: Security in ASP.NET (6 Hours)

- Authentication & Authorization
- Forms Authentication
- Role-Based Security
- Identity Framework (Overview)
- Preventing SQL Injection
- Input Validation

Module 10: Web API & Client-Side Integration (8 Hours)

- Introduction to ASP.NET Web API
- RESTful Services
- Creating APIs using ASP.NET
- JSON Handling
- Consuming APIs (AJAX / Fetch)
- Introduction to jQuery

Module 11: Deployment & Performance (6 Hours)

- Publishing ASP.NET Application
- IIS Deployment
- Configuration Files
- Caching
- Logging & Error Handling
- Performance Optimization

Module 12: Mini Projects & Case Studies (12 Hours)

Project Ideas:

- Student Management System
- Online Examination System
- Inventory Management System
- Employee Management Portal
- CRUD-based Web Application with Authentication

Learning Outcomes

After completing this course, learners will be able to:

- Develop web applications using ASP.NET & C#
- Apply OOP concepts in real projects
- Connect applications with SQL Server
- Implement authentication & authorization
- Deploy and maintain ASP.NET applications

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