Building Effective Websites using Microsoft MVC Training

Duration: **5 Day**

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info@bilginc.com
bilginc.com

Overview

Building Effective Websites using Microsoft MVC is designed for existing .NET developers who want to build modern web applications using the MVC approach with **Visual Studio 2022** and **ASP.NET Core 8.0**.

The course develops practical skills across the full application lifecycle, from structuring an MVC project and accessing data to testing, security, API development, state management and deployment.

Participants work with Models, Views and Controllers while also exploring Dependency Injection, Entity Framework, routing, validation, Bootstrap, Razor Pages, ASP.NET Identity and Web API.

The programme combines explanation with hands-on labs so that learners gain practical experience building controllers, creating views, working with databases, writing unit tests, developing responsive interfaces and deploying ASP.NET Core applications.

Prerequisites

Participants should have:

- Basic knowledge of HTML
- Experience creating web pages with JavaScript and CSS
- Knowledge of at least **C# 4**
- Familiarity with LINQ and Lambda expressions
- At least approximately three months of experience working with the .NET Framework

VB.NET developers should be comfortable reading C#.

Previous ASP.NET WebForms experience is not required.

Participants must have a **Microsoft account** before attending.

Who Should Attend

This course is particularly suitable for:

- Existing .NET Developers
- C# developers moving into ASP.NET Core
- Developers who want to build MVC-based web applications
- .NET professionals looking to modernise their web development skills

Outline

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Module 1 — Essential C# Refresher

A short refresher for participants who want to revisit the C# features required later in the course.

- Core C# concepts
- Language features used in MVC applications
- LINQ and Lambda review

This is not a beginner C# module and there is no lab.

Module 2 — Web Basics

A brief review of common web concepts and terminology.

- Core web terminology
- Client and server interaction
- Requests and responses
- Fundamental web application concepts

This section is intended as a refresher and does not include a lab.

Module 3 — Quick Tour of ASP.NET Core MVC

Explore how an MVC application is structured and how the different components interact.

Topics

- The MVC Pattern
- Models, Views and Controllers
- ASP.NET MVC conventions
- MVC project structure
- Visual Studio 2022 support
- NuGet
- Separation of concerns
- Routing and request processing

Lab

- Create an ASP.NET MVC project using Visual Studio 2022

Outcomes

Participants will:

- Understand the high-level structure of an MVC application.
- Recognise how Models, Views and Controllers interact.
- Create a new ASP.NET MVC project.

Module 4 — Dependency Injection and Configuration

Understand how Dependency Injection is used throughout ASP.NET Core.

Topics

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- Dependency Injection concepts
- DI in .NET Core
- Service registration
- Dependency injection
- Configuration Options injection
- The MVC Request Cycle

Outcomes

Participants will:

- Understand why Dependency Injection is important.
- Configure and use DI within ASP.NET Core.
- Inject configuration values where required.

Module 5 — Entity Framework

Explore Entity Framework as the main data access technology used throughout many MVC applications.

Topics

- Key Entity Framework features
- Code First
- Code First from Database
- Lazy Loading
- Eager Loading
- Explicit Loading
- LINQ to Entities
- Initialization
- Migrations
- Stored Procedures

Labs

- Code First and loading techniques
- Optional Initialization and Migration exercise

Outcomes

Participants will:

- Understand the main Entity Framework strategies.
- Select appropriate loading methods.
- Use initialization and migration approaches when required.

Module 6 — Controllers and Actions

Learn how Controllers process incoming requests and return results.

Topics

- What is a Controller?

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- Actions
- Action parameters
- Returning results
- Passing data to Views
- Asynchronous Actions
- HTTP GET
- HTTP POST
- Processing forms

Lab

- Build Controller classes

Outcomes

Participants will:

- Understand the Controller's role within MVC.
- Write Actions that process requests.

Module 7 — Unit Testing Controllers

Use Visual Studio testing capabilities to validate Controller behaviour.

Topics

- Unit Testing overview
- Entity Framework configuration
- In-memory databases

Lab

- Create a unit test for a Controller

Outcomes

Participants will:

- Understand how to create Unit Tests with Visual Studio.
- Test Controllers in isolation.

Module 8 — Views

Use Razor to generate client-side markup and present model data.

Topics

- Views
- Razor Syntax
- HTML Helpers
- Tag Helpers
- Layout Pages
- Partial Views

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- View Components
- Templates
- Create, Update and Delete forms

Lab

- Implement Views

Outcomes

Participants will:

- Render Views and Partial Views with Razor.
- Create reusable Layout Pages.
- Use Helpers to generate markup.
- Access model data from Views.

Module 9 — Bootstrap

Use Bootstrap to improve the presentation and responsiveness of web applications.

Topics

- Getting started with Bootstrap
- Bundling and Minification
- Responsive design
- Bootstrap Grid System
- Bootstrap components

Lab

- Style web pages using Bootstrap

Outcomes

Participants will:

- Use the Bootstrap UI Framework.
- Create mobile-first responsive web pages.

Module 10 — Validation

Explore model validation and techniques for protecting input.

Topics

- Data Annotations
- Validation Attributes
- Model Binding
- Preventing JavaScript Injection

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- Model Validation

Outcomes

Participants will:

- Understand the Model Binding process.
- Use validation attributes within model classes.

Module 11 — Error Handling

Learn how errors and exceptions can be handled within MVC applications.

Topics

- Error handling
- Exception bubbling
- Default error pages
- Error filters
- Script injection protection

Lab

- Implement custom error handling

Outcomes

Participants will:

- Create custom error handling for MVC applications.

Module 12 — Routing

Understand how URLs are mapped to Controller Actions.

Topics

- What are routes?
- Defining and using routes
- Convention-based Routing
- Attribute-based Routing
- Route constraints
- Literals
- Areas

Lab

- Configure and debug routes

Outcomes

Participants will:

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- Understand the purpose of routing.
- Add literals and constraints to routes.
- Recognise the benefits of Areas.

Module 13 — Web API

Develop and consume RESTful services.

Topics

- What is Web API?
- HTTP Requests
- HTTP Responses
- HTTP Methods
- Content Negotiation
- Controllers
- Data Transfer Objects
- Using Postman

Lab

- Create and call Web API services

Outcomes

Participants will:

- Understand the Web API framework.
- Build Web APIs.
- Test services using Postman.
- Consume APIs from different clients.

Module 14 — State Management

Explore methods for maintaining state in web applications.

Topics

- HTTP as a stateless protocol
- Cookies
- Session State
- TempData
- Scalability considerations
- Page output caching
- Application caching

Lab

- Manage and maintain application state

Outcomes

Participants will:

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- Understand the main techniques available for state management.

Module 15 — Razor Pages

Explore Razor Pages as a lightweight alternative to full MVC.

Topics

- What are Razor Pages?
- Enabling and creating Razor Pages
- Page Models
- Handlers
- Model Binding
- Data Validation
- Error Handling

Lab

- Add Razor Pages to an application

Module 16 — Security

Explore the ASP.NET Identity infrastructure and related authentication and authorisation options.

Topics

- Authentication
- Authorisation
- Managing users
- Identity User Interface
- Configuring ASP.NET Identity
- Extending the security system
- Alternative authentication schemes
- Policies
- JWT for Web API

Labs

- Add security to an application
- Configure policies
- Customise the security system
- Use JWT to authorise Web API calls

Outcomes

Participants will:

- Understand the security infrastructure provided by ASP.NET Core MVC.
- Configure authentication and authorisation.
- Secure APIs with JWT.

Module 17 — Deployment

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Explore the options available for publishing ASP.NET Core applications.

Topics

- Deployment options
- Web Deployment Tool
- Working with deployment packages
- Configuring deployment options
- Applying configuration transforms
- Deploying to IIS
- Deploying to Azure
- Creating and configuring deployment profiles

Lab

- Deploy an ASP.NET Core application

Outcomes

Participants will:

- Deploy ASP.NET Core applications to hosting environments.
- Publish applications to Microsoft Azure.
- Create and configure deployment profiles.