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ASP.NET MVC Using C#

Course #: VC-510 **Duration:** 3 days

Prerequisites

The student should have a good working knowledge of C# and the .NET Framework. Basic knowledge of ASP.NET and HTML is also required.

Details

This course provides a practical hands-on introduction to developing Web applications using ASP.NET MVC 5 and C#. This Web development framework from Microsoft emphasizes the separation of concerns in the architecture and testability of applications. The course includes coverage of the Razor View Engine, Entity Framework 6 and ASP.NET Web API 2. It also introduces Windows Azure and the deployment of ASP.NET MVC applications to the Azure cloud.

For Microsoft's cross-platform ASP.NET Core, see our ASP.NET Core MVC course.

The course covers the fundamentals of the Model-View-Controller design pattern and its implementation in ASP.NET MVC. This technology is compared with classical ASP.NET Web Forms. The two technologies share a common ASP.NET infrastructure. Visual Studio 2019 or higher is used as a productive platform for creating ASP.NET MVC applications. After presenting the fundamentals of the technology with several examples, the main components of Model, Controller, and View are covered in detail. The discussion of the Model incorporates modern Microsoft data access technologies, including SQL Server 2016, LINQ and ADO.NET Entity Framework 6. The routing mechanism of ASP.NET MVC is covered. The course introduces automated unit testing of Web applications, one of the chief advantages of the new technology. Security is covered, with some hands-on illustrations of attacks and defenses against them. The course includes a discussion of how ASP.NET MVC and Web Forms can be used together in the same application. The course includes an introduction to ASP.NET Web API and concludes with deployment to Windows Azure.

Numerous programming examples and exercises are provided. The student will receive a comprehensive set of notes and all the programming examples.

Software Needed

The required software is Visual Studio 2019 or higher. The free Visual Studio Community 2019 may be used. The operating system should be Windows 7SP1 or more recent. Several free tools are also used. These can all be downloaded from the Web.

Outline

ASP.NET MVC Using C#

- **Introduction to ASP.NET MVC**
    - Review of ASP.NET Web Forms
    - Advantages and Disadvantages of Web Forms
    - Model-View-Controller Pattern
    - ASP.NET MVC
    - Advantages and Disadvantages of ASP.NET MVC

    - Unit Testing
- **Getting Started with ASP.NET MVC**
    - Installing ASP.NET MVC
    - Using Visual Studio
    - Hello World for ASP.NET MVC
    - Rendering Views
    - Razor View Engine
    - Dynamic Output
- **MVC Architecture**
    - The Controller
    - The View
    - The Model
    - Helper Methods for HTML
    - Form Submission
    - Model Binding
    - Input Validation
- **The Model**
    - Microsoft Technologies for the Model
    - ADO.NET
    - LINQ
    - ADO.NET Entity Framework 6
    - CRUD Operations
    - NuGet Package Manager
- **The Controller**
    - IController Interface
    - Controller Base Class
    - Actions
    - Retrieving Data from a Request
    - Action Results
    - Action Attributes
    - Filters
    - Asynchronous Controllers
- **The View**
    - View Responsibility
    - Using ViewBag
    - Using Dynamic Objects
    - HTML Helpers
    - Validation Attributes
- **Routing**
    - Routing in ASP.NET MVC
    - Properties of Routes
    - Parameters in Routing
    - Registering Routes
    - Debugging Routes
    - Areas
- **Unit Testing**
    - Test-Driven Development
    - Test Automation
    - Refactoring
    - Visual Studio Unit Test Framework
    - Test Cases
    - Test Classes
    - Test Runners
    - Testing ASP.NET MVC Applications
    - Dependency Injection
    - Mocking Frameworks
    - Inversion of Control Containers
- **Security**
    - Input Forgery
    - Cross-Site Scripting
    - Session Hijacking
    - Cross-site Request Forgery
    - SQL Injection
    - Using the MVC Framework Securely
- **Combining ASP.NET MVC and Web Forms**

    - Integrating Web Forms and MVC
    - Using Web Forms in an ASP.NET MVC Application
- **.NET Web API**
    - ASP.NET Web API
    - Representational State Transfer
    - REST and Web API
    - HTTP Services Using Web API
    - Using Fiddler
    - ASP.NET Web API Clients
    - CRUD Operations
- **.NET and Azure**
    - What Is Windows Azure?
    - A Windows Azure Testbed
    - Deploying an Application to Azure
    - Updating an Application on Azure