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 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.

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 2015 with .NET 4.5.2 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 2014, 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. An appendix covers deployment on IIS 7.5.

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

**Audience:** Experienced application developers or architects responsible for Web applications in a Microsoft environment.

**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.

**Number of Days:** 3 days

1. **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

2. **Getting Started with ASP.NET MVC**
   - Installing ASP.NET MVC
   - Using Visual Studio
   - Hello World for ASP.NET MVC

3. **ASP.NET MVC Architecture**
   - The Controller in ASP.NET MVC
   - The View in ASP.NET MVC
   - The Model in ASP.Net MVC
   - Helper Methods for HTML
   - Form Submission
   - Model Binding
   - Input Validation

4. **The Model**
   - Microsoft Technologies for the Model

   Rendering Views
   - Razor View Engine
   - Dynamic Output

   The Controller in ASP.NET MVC
   - The View in ASP.NET MVC
   - The Model in ASP.Net MVC
   - Helper Methods for HTML
   - Form Submission
   - Model Binding
   - Input Validation

   Microsoft Technologies for the Model
5. The Controller
   - IController Interface
   - Controller Base Class
   - Actions
   - Retrieving Data from a Request
   - Action Results
   - Action Attributes
   - HomeController
   - Filters
   - Asynchronous Controllers

6. The View
   - View Responsibility
   - Using ViewBag
   - Using Dynamic Objects
   - Html Helpers
   - Validation Attributes

7. Routing
   - Routing in ASP.NET MVC
   - Properties of Routes
   - Parameters in Routing
   - Registering Routes
   - Debugging Routes
   - Areas

8. Unit Testing
   - Test-Drive Development
   - Test Automation
   - Refactoring
   - Visual Studio Unit Test Framework
   - Test Classes
   - Test Runners
   - Fixing the Bug
   - Testing Controllers
   - Testing ASP.NET MVC Applications
   - Dependency Injection
   - Mocking Frameworks
   - Inversion of Control Containers

9. Security
   - Input Forgery
   - Session Hijacking
   - Cross-site Request Forgery
   - SQL Injection
   - Using the MVC Framework Securely

10. Combining ASP.NET MVC and Web Forms
    - Using Web Forms in an MVC Application
    - Using MVC in a Web Forms Application

11. ASP.NET Web API
    - ASP.NET MVC and Web API
    - Representational State Transfer
    - REST and Web API
    - HTTP Services Using Web API
    - Using Fiddler
    - ASP.NET Web API Clients
    - CRUD Operations

12. ASP.NET and Azure
    - What Is Windows Azure?
    - A Windows Azure Testbed
    - Deploying an Application to Azure
    - Updating an Application on Azure

13. Appendix A: Learning Resources

14. Appendix B: Deployment in IIS 7.5
    - IIS 7.5
    - MVC with IIS 7.5
    - XCOPY Deployment