20486B: Developing ASP.NET MVC 4 Web Applications

Course Overview

This course provides students with the knowledge and skills to develop ASP.NET MVC 4 web applications.

Course Introduction
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Module 01 - Exploring ASP.NET MVC 4

Lesson 1: Overview of Microsoft Web Technologies
Introduction to Microsoft Web Technologies
Overview of ASP.NET 4.5
Client-Side Web Technologies
Internet Information Server 8.0
Windows Azure

Lesson 2: Overview of ASP.NET 4.5
Web Pages Applications
Web Forms Applications
MVC Applications
Discussion: ASP.NET Application Scenarios
Shared ASP.NET Features

Lesson 3: Introduction to ASP.NET MVC 4
Models, Views, and Controllers
Demo - How to Explore an MVC Application
New Features of ASP.NET MVC 4
Demo - Lab Set-Up
Module 01 Review

Module 02 - Designing ASP.NET MVC 4 Web Applications

Lesson 1: Planning in the Project Design Phase
Project Development Methodologies
Gathering Requirements
Planning the Database Design
Planning for Distributed Applications
Planning State Management
Planning Globalization and Localization

Lesson 2: Designing Models, Controllers, and Views
Designing Models
Designing Controllers
Designing Views
Demo - Storyboarding
Module 02 Review
Module 03 - Developing ASP.NET MVC 4 Models

Lesson 1: Creating MVC Models
Developing Models
Using Display and Edit Data Annotations on Properties
Validating User Input with Data Annotations
What Are Model Binders?
Model Extensibility
A Custom Validation Data Annotation
A Custom Model Binder
Demo - How to Add a Model

Lesson 2: Working with Data
Connecting to a Database
Example Connection Strings
The Entity Framework
Using an Entity Framework Context
Using an Entity Framework Context in Controllers
Using LINQ to Entities
Demo - How to Use Entity Framework Code
Data Access in Models and Repositories
Demo - Developing ASP.NET MVC 4 Models

Module 03 Review

Module 04 - Developing ASP.NET MVC 4 Controllers

Lesson 1: Writing Controllers and Actions
Responding to User Requests
Writing Controller Actions
Using Parameters
Passing Information to Views
Using the ViewBag Object
Demo - How to Create a Controller
What Are Controller Factories?
A Custom Controller Factory

Lesson 2: Writing Action Filters
What Are Filters?
Creating and Using Action Filters
Discussion: Action Filter Scenarios
Demo - Developing ASP.NET MVC 4 Controllers

Module 04 Review

Module 05 - Developing ASP.NET MVC 4 Views

Lesson 1: Creating Views with Razor Syntax
Adding Views
Differentiating Server Side Code from HTML
Features of Razor Syntax
Binding Views to Model Classes and Displaying Properties
Rendering Accessible HTML
Alternative View Engines

Lesson 2: Using HTML Helpers
Using Action Helpers
Using Display Helpers
Lesson 3: Re-using Code in Views
Creating Partial Views
Discussion: Partial View Scenarios
Demo - Expanding Your Views
Demo - Developing ASP.NET MVC 4 Views
Module 05 Review

Module 06 - Testing and Debugging ASP.NET MVC 4 Web Applications
Lesson 1: Unit Testing MVC Components
Why Perform Unit Tests?
Principles of Test Driven Development
Writing Loosely Coupled MVC Components
Writing Unit Tests for MVC Components
Using a Test Double in a Unit Test
Specifying the Correct Context
Using Constructors to Specify Repositories
Demo - How to Run Unit Tests
Using Mocking Frameworks
Demo - Unit Testing Concepts
Lesson 2: Implementing an Exception Handling Strategy
Raising and Catching Exceptions
Configuring Exception Handling
Using Visual Studio IntelliTrace in MVC
Logging Exceptions
Health Monitoring
Module 06 Review

Module 07 - Structuring ASP.NET MVC 4 Web Applications
Lesson 1: Analyzing Information Architecture
What Is Information Architecture?
What Is Search Engine Optimization?
Lesson 2: Configuring Routes
The ASP.NET Routing Engine
Adding and Configuring Routes
Using Routes to Pass Parameters
Demo - How to Add Routes
Unit Tests and Routes
Lesson 3: Creating a Navigation Structure
The Importance of Well-Designed Navigation
Configuring the MVC Site Map Provider
Adding Menu Controls
Demo - How to Build Site Navigation
Module 07 Review
Module 08 - Applying Styles to ASP.NET MVC 4 Web Applications
Lesson 1: Using Layouts
What Are Layouts?
Creating a Layout
Linking Views and Layouts
Lesson 2: Applying CSS Styles to an MVC Application
Overview of User Interface Design with Expression Blend
Importing Styles into an MVC Web Application
Demo - How to Apply a Consistent Look and Feel
Lesson 3: Creating an Adaptive User Interface
The HTML5 Viewport Attribute
CSS Media Queries
MVC 4 Templates and Mobile-Specific Views
jQuery Mobile
Demo - Bootstrap
Module 08 Review

Module 09 - Building Responsive Pages in ASP.NET MVC 4 Web Applications
Lesson 1: Using AJAX and Partial Page Updates
Why Use Partial Page Updates?
Using AJAX in an MVC 4 Web Application
The Ajax.ActionLink Helper
Lesson 2: Implementing a Caching Strategy
Why Use Caching?
The Output Cache
The Data Cache
The HTTP Cache
Preventing Caching
Demo - How to Configure Caching
Module 09 Review

Module 10 - Using JavaScript and jQuery for Responsive MVC 4 Web Applications
Lesson 1: Rendering and Executing JavaScript Code
Adding JavaScript Files
Calling JavaScript Procedures
JavaScript Libraries
Using Content Delivery Networks for JavaScript Libraries
Using the NuGet Tool to Add Packages
Demo - Using NuGet Packages
Demo - How to Use NuGet to Add a JavaScript Library
Lesson 2: Using jQuery and jQueryUI
Introduction to jQuery
Linking to jQuery Libraries
Accessing HTML Elements by Using jQuery
Modifying HTML Elements by Using jQuery
Calling a Web Service by Using jQuery
Using the ajax Function
Introduction to jQueryUI
Demo - How to Add a jQueryUI Widget
Demo - Bootstrap Framework
Module 10 Review
Module 11 - Controlling Access to ASP.NET MVC 4 Web Applications

Lesson 1: Implementing Authentication and Authorization
- Local Authentication Providers
- Claims-Based Authentication
- Federated Authentication
- Restricting Access to Resources
- Demo - How to Authorize Access to Controller Actions
- Demo - Authorize Attribute

Lesson 2: Assigning Roles and Membership
- Role Providers in ASP.NET 4.5
- Adding User Accounts to Roles
- Building a Custom Roles Provider
- Providing Membership Services
- Building a Custom Membership Provider
- Demo - How to Reset a Password

Module 11 Review

Module 12 - Building a Resilient ASP.NET MVC 4 Web Application

Lesson 1: Developing Secure Sites
- Cross-Site Scripting
- Other Attack Techniques
- Disabling Attack Protection
- Secure Sockets Layer

Lesson 2: State Management
- Why Store State Information?
- State Storage Options
- Configuring State Storage
- Scaling State Storage Mechanisms
- Demo - How to Store and Retrieve State Information
- Demo - Temp Data State Storage Option

Module 12 Review

Module 13 - Using Windows Azure Web Services in ASP.NET MVC 4 Web Applications

Lesson 1: Introducing Windows Azure
- What Is Windows Azure?
- Benefits of Hosting Services in Windows Azure
- Benefits of Hosting Web Applications in Windows Azure
- Windows Azure Storage Services
- Discussion: Windows Azure Scenarios

Lesson 2: Designing and Writing Windows Azure Services
- Windows Azure Visual Studio Project Templates
- Demo - Windows Azure Project
- Coding a Web Service
- The Life Cycle of a Service
- Deploying a Web Service
- Debugging a Windows Azure Web Service

Lesson 3: Consuming Windows Azure Services in a Web Application
- Calling a Windows Azure Service by Using Server-Side Code
- Calling a Windows Azure Service by Using jQuery
- Demo - How to Call a Windows Azure Service by Using jQuery

Module 13 Review
Module 14 - Implementing Web APIs in ASP.NET MVC 4 Web Applications
Lesson 1: Developing a Web API
What Is a Web API?
Routing in Web API
Creating a Web API for an MVC 4 Web Application
Demo - Creating a Web API Project
RESTful Services
Data Return Formats
Using Routes and Controllers in Web APIs
Demo - How to Explore a Web API by Using Internet Explorer

Lesson 2: Calling a Web API from Mobile and Web Applications
Calling Web APIs by Using Server-Side Code
Calling Web APIs by Using jQuery Code
Calling Web APIs Using Windows Phone Applications
Demo - Implementing APIs in ASP.NET MVC 4 Web Applications

Module 14 Review

Module 15 - Handling Requests in ASP.NET MVC 4 Web Applications
Lesson 1: Using HTTP Modules and HTTP Handlers
What Is an HTTP Module?
Creating HTTP Modules
What Is an HTTP Handler?
Discussion: Scenarios for HTTP Modules and Handlers

Lesson 2: Using Web Sockets
What Is the WebSocket Protocol?
Coding Web Sockets Connections
What Is SignalR?
Demo - How to Add a Chat Room to a Web Application by using SignalR
Demo - Complex SignalR App

Module 15 Review

Module 16 - Deploying ASP.NET MVC 4 Web Applications
Lesson 1: Deploying a Web Application
ASP.NET MVC 4 Dependencies
Deploying Web Applications to Web Servers
Deploying Web Applications to Multi-Server Farms
Deploying Web Applications on Windows Azure
Demo - How to Create a Windows Azure Website

Lesson 2: Deploying an ASP.NET MVC 4 Web Application
Reviewing Configuration for Production
Using Bin Deploy
Using Visual Studio 2012 Deployment Tools
Demo - How to Deploy a Website to Windows Azure

Module 16 Review

Course Closure

Total Duration: 15h 17m