Developing Web Applications with Microsoft Visual Studio 2010

36 Contact Hours

Course Overview

In this course, students will learn to develop advanced ASP.NET MVC and Web Forms applications using .NET Framework 4 tools and technologies. The focus will be on coding activities that enhance the performance and scalability of the Web site application. ASP.NET MVC will be introduced and compared with Web Forms so that students know when each should/could be used. This will also prepare the student for exam 70-515.

Audience

This course is intended for professional Web developers who use Microsoft Visual Studio in a team-based, medium-sized to large development environment. Members of the audience have a minimum of two to three years of experience developing Web-based applications by using Microsoft Visual Studio and Microsoft ASP.NET. Members of the audience are experienced users of Microsoft Visual Studio 2008 SP1 and newer releases of the Visual Studio product. The audience understands how to use the new features of Visual Studio 2010.

At Course Completion

After completing this course, students will be able to:
 •Describe the underlying architecture and design of a Web application.
 •Apply best practices and make appropriate trade-offs based on business requirements when designing a Web application.
 •Develop MVC models.
 •Develop MVC controllers.
 •Develop MVC views.
 •Optimize the design of a Web application for discoverability by search engines.
 •Write server-side code for Web Forms.
 •Optimize data management for Web Forms.
 •Ensure quality by debugging, unit testing, and refactoring.
 •Secure a Web application.
 •Apply Master Pages and CSS for a consistent application UI.
 •Develop client-side scripts and services for a responsive, rich, and interactive UI.
 •Implement advanced AJAX in a Web application.
 •Deploy a Web application.
 •Develop a Web application by using Silverlight

Prerequisites

In addition to their professional Web development experience, students who attend this training should have the following technical knowledge:

•An understanding of the problem-solving techniques that apply to software development, including the following principles of software development :

modern software development model

typical phases of a software development lifecycle

concepts of event-driven programming

concepts of object-oriented programming

creating use-case diagrams

designing and building a user interface

developing a structured application

•A basic understanding of the following scripting techniques and some hands-on experience writing scripts:

Web scripting techniques

Macro scripting techniques

Windows scripting techniques

•A general understanding of the purpose, function, and features of following .NET Framework topics :

Common Language Runtime

.NET Framework class library

Common Type System

Component interoperation

Cross-Language Interoperability

Assemblies in the Common Language Runtime

Application Domains

Runtime hosts supported by the .NET Framework

•Experience using Visual Studio 2008 in the following task areas:

Declaring and initializing typed variables using the Camel case naming convention

Using arithmetic, relational, and logical operators in code statements

Using branching statements to control code execution

Using looping statements to iterate through collections or repeat steps until a specified condition is met

Creating classes and methods to establish the basic structure of an application

Using methods and events to implement the programming logic of an application

Identifying syntax and logic errors

Accessing and managing data from a data source

•Experience in object oriented design and development as follows :

Creating and accessing classes and class properties

Creating and accessing methods and overloaded methods

Implementing inheritance, base classes, and abstract classes

Declaring, raising, and handling events

Responding to and throwing exceptions

Implementing interfaces and polymorphism

Implementing shared and static members

Implementing generics

Creating components and class libraries

•Experience in N-Tier application design and development as follows:
Managing a software development process
Controlling input at the user interface level in Windows Client and Web applications
Debugging, tracing, and profiling .NET applications
Monitoring and logging .NET applications
Implementing basic testing best practices
Performing basic Data Access tasks with LINQ
Implementing basic security best practices in .NET Applications
Implementing basic service calls
Using .NET Configuration Files
Deploying .NET Framework Applications using ClickOnce and the MS Installer

Course Outline

Module 1: Overview of Web Application Design
This module describes the underlying architecture and design of a Web application
Lessons
 •Overview of IIS 7.0
 •Overview of ASP.NET 4.0
 •Introduction to the MVC Framework
 •Overview of the Request Life Cycle
Lab : Exploring the Adventure Works Web Site
 •Exercise 1: Explore the Adventure Works Web Site
 •Exercise 2: Comparing Web Forms and MVC
 •Exercise 3: Working with the Web Forms Page Life Cycle
After completing this module, students will be able to:
 •Describe the underlying architecture of ASP.NET 4.0.
 •Identify new features in ASP.NET 4.0.
 •Describe the components of the MVC framework.
 •Describe the structure of an MVC application.
 •Describe the life cycle of a Web Forms page.
 •Describe the life cycle of an MVC page.
 •Describe the differences between the life cycle of a Web Forms page and an MVC page

Module 2: Designing a Web Application
This module describes the best practices and trade-offs that you need to make when designing a Web application.
Lessons
 •Web Applications: Case Studies
 •Web Application Design Essentials
 •Guidelines for Determining When to Use Web Forms and MVC
 •Visual Studio 2010 Tools and Technologies for Web Application Design

Lab : Redesigning the Adventure Works Web site
 •Exercise 1: Reviewing the Adventure Works Web site
 •Exercise 2: Redesigning the Adventure Works Web site
 •Exercise 3: Adding MVC Capabilities to the Adventure Works Web site
After completing this module, students will be able to:
 •Explain the different types of web applications and their characteristics .
 •Choose the correct design based on the on business requirements, utilizing Web Forms and MVC based .
 •Explain the different tools and technologies and best practices around each.

Module 3: Developing MVC Models
This module describes the MVC development model (Models, Controllers, and Views) and how to create the Models that are used to access and modify the data in a data source.
Lessons
 •Exploring Ways to Create MVC Models
 •Creating a Data Repository
Lab : Developing MVC Models
 •Exercise 1: Exploring Ways to Create MVC Models
 •Exercise 2: Creating Data Repository
After completing this module, students will be able to:
 •Create MVC models by using classes and data mapping tools.
 •Create a data repository

Module 4: Developing MVC Controllers
This module describes how to create the Controllers that are used to respond to communications from the user and how to implement the application flow and logic.
Lessons
 •Implementing MVC Controllers
 •Creating Action Methods
Lab : Developing MVC Controllers
 •Exercise 1: Creating an MVC Controller
 •Exercise 2: Adding Code to List the Blog Entries
 •Exercise 3: Adding Code to Create a New Blog Entry
 •Exercise 4: Adding Code to Edit a Blog Entry
 •Exercise 5: Adding Code to Delete a Blog Entry
After completing this module, students will be able to:
 •Implement MVC controllers.
 •Create action methods

Module 5: Developing MVC Views

This module describes how to create the Views that are used to expose the application UI. The module also covers how to manage pre-action and post-action behavior of Controller action methods using the included action filters are provided as part of MVC

Lessons
 •Implementing MVC Views
 •Implementing Strongly-Typed MVC Views
 •Implementing Partial MVC Views

Lab : Developing MVC Views
 •Exercise 1: Develop a List MVC View
 •Exercise 2: Develop a Details MVC View
 •Exercise 3: Develop a Create MVC View
 •Exercise 4: Develop an Edit MVC View
 •Exercise 5: Develop a Delete MVC View

After completing this module, students will be able to:
 •Describe what an MVC view is and the varied types of views.
 •Create an MVC view.
 •Implement strongly typed MVC views.
 •Implement partial MVC views

Module 6: Designing for Discoverability

This module describes how to implement the navigational design and also how discoverability will be achieved through content keywords and page URLs.

Lessons
 •Overview of Search Engine Optimization
 •Creating the Robots and Sitemap Files
 •Using ASP.NET Routing

Lab : Designing for Discoverability
 •Exercise 1: Mapping URLs of Web Forms Pages
 •Exercise 2: Creating a Sitemap File
 •Exercise 3: Building the Application Infrastructure

After completing this module, students will be able to:
 •Describe the need to optimize the design of a Web site for discoverability by search engines and how the IIS SEO Toolkit helps in optimization.
 •Create robots.txt and sitemap.xml files.
 •Use ASP.NET with Web Forms and MVC pages.

Module 7: Writing Server-Side Code for Web Forms

This module describes the advanced features of server-side coding and technologies. The module describes how to allow the website to move into a global and web farm environment through localization, shared sessions, and custom user controls. The module will also cover how to use the custom validator and regular expressions

Lessons
 •Overview of the Structure of a Web Application
 •Controlling ViewState
 •Localizing a Web Application
 •Persisting Data on a Web Forms Page
 •Validating User Input
Lab : Writing Server-Side Code for Web Forms
 •Exercise 1: Modifying a Web Forms Page to Display Localized Content
 •Exercise 2: Persisting data on a Web Forms Page
 •Exercise 3: Exploring Viewstate
 •Exercise 4: Adding Validation to Web Forms Pages
After completing this module, students will be able to:
 •Describe the structure of a Web application.
 •Control ViewState based on performance requirements.
 •Localize a Web application by using resource files.
 •Describe the techniques used to persist user information. Describe the different technologies used in web farms.
 •Validate user input in Web Forms and MVC pages.

Module 8: Optimizing Data Management for Web Forms
This module describes how to optimize and display data management tasks for a Web Forms-based application using Dynamic Data, Data Binding, LinqToEntities, server side controls, and server-side code.
Lessons
 •Managing Data by Using LINQ to Entities
 •Using Data Source Controls
 •Using ASP.NET Dynamic Data
Lab : Optimizing Data Management for Web Forms
 •Exercise 1: Managing Data by Using LINQ to Entities
 •Exercise 2: Customizing the GridView
 •Exercise 3: Using ListView, DetailsView | Charts
 •Exercise 4: Managing Data by Using ASP.NET Dynamic Data
After completing this module, students will be able to:
 •Use the LINQtoEntities framework to manage data
 •Use data source and data bound controls in Web Forms.
 •Use ASP.NET Dynamic Data in Web Forms.

Module 9: Ensuring Quality by Debugging, Unit Testing, and Refactoring
This module describes how to perform check-in testing for their Web Forms and MVC applications as well as how to use the built-in debugging capabilities of VS2010.
Lessons
 •Debugging and Refactoring Code
 •Unit Testing Code

•Processing Unhandled Exceptions
•Test Driven Development
Lab : Debugging, Unit Testing and Refactoring
 •Exercise 1: Configuring Error Handling
 •Exercise 2: Debugging Code
 •Exercise 3: Logging
 •Exercise 4: Creating Unit Tests
 •Exercise 5: Implementing the Test-First Development Methodology
After completing this module, students will be able to:
 •Debug and refactor code
 •Unit test code.
 •Describe how to log information to a file, database, event or other, including best practices.
 •Describe the Test-Driven Development methodology.

Module 10: Securing a Web Application
This module describes how to mitigate common security threats and to implement the essentials (must haves) of Web security in both MVC and Web Forms applications.
Lessons
 •Configuring Authentication
 •Configuring ASP.NET Membership
 •Managing Authorization by Using ASP.NET Roles
Lab : Securing a Web Application
 •Exercise 1: Configuring ASP.NET Membership and Roles
 •Exercise 2: Authentication
 •Exercise 3: Authorization
After completing this module, students will be able to:
 •Configure authentication
 •Configure ASP.NET Membership
 •Manage authorization by using ASP.NET Roles

Module 11: Applying Master Pages and CSS
This module describes how to achieve a consistent UI in a reusable manner.
Lessons
 •Applying Master Pages
 •Applying CSS, Skins, and Themes
Lab : Applying Master Pages and CSS
 •Exercise 1: Modify a Master Page
 •Exercise 2: Create Nested Master Page
 •Exercise 3: Integrating a Master Page
 •Exercise 4: Control Skins
 •Exercise 5: Applying Styles | Themes

After completing this module, students will be able to:
 •Identify challenges in developing a Web application that is compatible across a wide range of browsers and ways to address these challenges.
 •Apply master pages for a consistent application UI.
 •Apply CSS for a consistent application UI.

Module 12: Developing Client Side Scripts and Services
This module described how to develop client-side scripts and services for a responsive, rich, and interactive application UI.
Lessons
 •Developing Client-Side Scripts
 •Implementing AJAX
 •Creating Services
Lab : Developing Client Side Scripts and Services
 •Exercise 1: Creating Client-Side Script
 •Exercise 2: Advanced JQuery
 •Exercise 3: Creating a WCF Service
After completing this module, students will be able to:
 •Develop client-side scripts
 •Implement advanced JQuery
 •Create services

Module 13: Implementing Advanced AJAX in a Web Application
This module describes the programmatic side of AJAX enabled controls (as well as extending server controls to include AJAX functionality) on a Web Forms page as well as implementing AJAX on a MVC page
Lessons
 •Implementing Ajax in ASP.NET MVC Pages Using Microsoft Ajax
 •Implementing Ajax in ASP.NET MVC Pages Using jQuery
 •Working With jQuery and Ajax Events
Lab : Implementing Advanced Ajax for the AdventureWorks web application
 •Exercise 1: Using AJAX in an MVC Page Scenario
 •Exercise 2: Using jQuery in an MVC Page
 •Exercise 3: Handling jQuery Ajax Events
After completing this module, students will be able to:
 •Manage browser history
 •Implement AJAX in MVC pages
 •Implement jQuery

Module 14: Deploying a Web Application
This module describes how to plan, configure, and perform deployment tasks associated with a production Web site. The module also describes the Web site lifecycle as it pertains to deployment.

Lessons
 •Overview of Web Application Deployments
 •Overview of Web Site Deployments
 •Deploying Adventure Works
Lab : Deploying Adventure Works
 •Exercise 1: Deploying a Web Application Project Using One-Click Publish
 •Exercise 2: Deploying a Web Application Using a Web Deployment Package
 •Exercise 3: Deploying a Web Site with the Copy Web Site Tool
 •Exercise 4: Deploying a Web Site with the Publish Web Site Utility
After completing this module, students will be able to:
 •Identify challenges in deploying Web applications and describe varied target environments .
 •Describe Web application compilation methods and tools.
 •Transform the web.config file when deploying a Web application

Module 15: Developing a Web Application by Using Silverlight
This module introduce students to Silverlight by having them integrate a Silverlight module into an existing ASP.NET application. Students will learn how to add a Silverlight project to an existing solution, leverage the existing Web application by calling a WCF service, and display the information in Silverlight.
Lessons
 •Introduction to Rich Internet Applications
 •Overview of Silverlight
 •Creating a Silverlight Application
Lab : Developing a Web Application by Using Silverlight
 •Exercise 1: Creating a Silverlight Project
 •Exercise 2: Creating a Silverlight WCF Service
 •Exercise 3: Displaying Data by Using Silverlight Controls
After completing this module, students will be able to:
 •Describe the characteristics of RIAs and the technologies for building them.
 •Describe the features of Silverlight, its architecture, and the use of XAML for developing Silverlight applications
 • Create a Silverlight application