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Information Technology & Training

Course 10264A:

Developing Web Applications with Microsoft Visual Studio 2010

Course Length:

5 days

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.

Target Student

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.

Objectives

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

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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

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- 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 Content

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

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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

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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

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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

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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

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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 AdventureWorks

Lab : Deploying AdventureWorks

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

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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.