10264A VB: Developing Web Applications with Microsoft Visual Studio 2010

- **Course Number:** 10264A
- **Course Length:** 5 Days

**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.

**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

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.

Course Outline

**Course Introduction**

Course Introduction
Module 01 - Overview of Web Application Design 1h 43m

Lesson 1: Overview of IIS 7.0
Key Features of IIS 7.0
Architecture of ASP.NET on IIS 7.0
ASP.NET Enhancements for IIS 7.0
Demo - Administering IIS 7.0 by Using IIS Manager

Lesson 2: Overview of ASP.NET 4.0
ASP.NET 4.0 Architecture
New Features in ASP.NET 4.0

Lesson 3: Introduction to the MVC Framework
What is the MVC Framework?

Demo - Exploring an MVC Application

Lesson 4: Overview of the Request Life Cycle
Life Cycle of a Web Forms Request
Life Cycle of a MVC Request
Comparison of the Web Forms and MVC Request Life Cycles
Working with the Web Forms Page Life Cycle

Module 01 Review

Module 02 - Designing a Web Application 39m

Lesson 1: Web Applications: Case Studies
Discussion: Overview of Web Applications and their Characteristics
Overview of the Web Application Design Process

Lesson 2: Web Application Design Essentials
Common Design Considerations
Discussion: Web Forms and MVC
Guidelines for Determining When to Use Web Forms and When to Use MVC
Considerations for Using Web Forms with MVC

Lesson 3: Microsoft Visual Studio 2010 Tools and Technologies for Web Application Design
Overview of the Design View in Visual Studio 2010
Enterprise Library
IIS SEO Toolkit

Module 02 Review

Module 03 - Developing MVC Models 1h 18m

Lesson 1: Exploring Ways to Create MVC Models
Overview of MVC
What is an MVC Model?
Creating an MVC Model
Creating an MVC Model by Using Classes
Demo - Creating an MVC Model by Using Classes

Lesson 2: Working with Data in MVC Models
What is LINQ to SQL?
Active Record Pattern
What is the Entity Framework?
LINQ to SQL vs. Entity Framework
Data Mapper Pattern

**Lesson 3: Creating a Data Repository**
What is the Repository Pattern?
Demo - Creating a Data Repository
Data Type Errors Handled by MVC Models
Business Logic Errors and MVC
Extending Model Class to Add Business Rules
Handling Business Rule Errors
Model Data Validation
Creating a Data Validation Class

**Module 04 - Developing MVC Controllers**
**Lesson 1: Implementing MVC Controllers**
What is an MVC Controller?
Demo - Creating an MVC Controller
What is an Action Filter?
Demo - Using an Action Filter

**Lesson 2: Creating Action Methods**
What are Action Methods?
Calling an MVC View
Retrieving Data from the Request
Demo - Retrieving Data from the Request

**Module 04 Review**

**Module 05 - Developing MVC Views**
**Lesson 1: Implementing MVC Views**
What is an MVC View?
Demo - Creating an MVC View
What Are HTML Helpers?

**Lesson 2: Implementing Strongly-typed MVC Views**
What is a Strongly-typed View?
Demo - Creating a Strongly-typed View
CRUD MVC Views

**Lesson 3: Implementing Partial MVC Views**
What is a Partial MVC View?
Demo - Creating a Partial MVC View

**Module 05 Review**

**Module 06 - Designing for Discoverability**
**Lesson 1: Search Engine Optimization**
Overview of Search Engine Optimization
Components of the IIS SEO Toolkit
Demo - Analyzing a Website by Using the IIS SEO Toolkit
Lesson 2: Discoverability Files
What are Robots Files?
Demo - Creating a Robots File
What is the Sitemap File?
Demo - Creating a Sitemap File

Lesson 3: Using ASP.NET Routing
How ASP.NET Routing Works
Demo - Using ASP.NET Routing with Web Forms Pages
Using ASP.NET Routing with MVC Pages
Creating Route Constraints
Demo - Creating Route Constraints
Creating Custom Routes
Demo - Creating Custom Routes

Module 06 Review

Module 07 - Writing Server-Side Code for Web Forms 2h 9m

Lesson 1: Overview of the Structure of a Web Application
Structure of a Web Application
Web Application File Types
Web Application Compilation Methods

Lesson 2: Controlling ViewState
What is View State?
Controlling View State
Using ViewStateMode
Using Control State
View State Best Practices

Lesson 3: Localizing a Web Application
What is Localization?
Working with Resource Files
Reading Data from Resource Files
Demo - Localize a Web Application

Lesson 4: Persisting Data on a Web Forms Page
Introduction to State Management
Options for State Management
Options for Saving Session State
Using SQL Server to Store Session State

Lesson 5: Validating User Input
Why Validate?
Validation Controls
Validation Controls Properties
Validation Groups
Displaying Validation Errors
Regular Expressions Validation
Custom Validation

Module 07 Review
Module 08 - Optimizing Data Management for Web Forms

Lesson 1: Managing Data by Using LINQ to Entities
Overview of LINQ to Entities
Overview of ADO.NET Entity Framework Object Services
The Entity Data Model
Demo - Creating an Entity Data Model
Object Oriented Programming using LINQ to Entities
CRUD Operations using LINQ to Entities

Lesson 2: Using Data Source Controls
Types of Data Source Controls
Capabilities of Data Source Controls
Advanced GridView Control Techniques
How to use the ListView and DetailsView Controls
Using the Microsoft Chart Control

Lesson 3: Using ASP.NET Dynamic Data
What Is ASP.NET Dynamic Data
ASP.NET Dynamic Data Usage Scenarios
Scaffolding Feature of ASP.NET Dynamic Data
Routing Feature of ASP.NET Dynamic Data
Demo - Creating an ASP.NET Dynamic Data Web Application

Module 08 Review

Module 09 - Ensuring Quality by Debugging, Unit Testing and Refactoring

Lesson 1: Debugging and Refactoring Code
Overview of Debugging
Overview of Debugging Using Visual Studio 2010 Debugging Tools
Demo - Enabling Debugging of a Web Application
What is Refactoring?
Extract Method Refactoring
Demo - Extract Method Refactoring
Encapsulate Field Refactoring
Demo - Encapsulate Field Refactoring
Extract Interface Refactoring
Demo - Extract Interface Refactoring

Lesson 2: Unit Testing Code
What is Unit Testing?
Steps to Creating a Unit Test
Demo - Creating and Running a Unit Test
Optional Unit Test Steps

Lesson 3: Processing Unhandled Exceptions
Displaying a Custom Error Page
Lesson 4: Test-Driven Development
Advantages of Test-Driven Development over Traditional Development
The Test-Driven Development Process
Module 09 Review

Module 10 - Securing a Web Application
Lesson 1: Configuring Authentication
IIS Authentication
Types of ASP.NET Authentication
Demo - Configuring IIS Authentication
How to Configure Forms Authentication
Lesson 2: Configuring ASP.NET Membership
What is ASP.NET Membership?
How to Configure ASP.NET Membership
Demo - Managing Users by Using ASP.NET Membership
How to Implement the Login Control
PasswordRecovery Control
Lesson 3: Managing Authorization by Using ASP.NET Roles
What are ASP.NET Roles?
Demo - Managing ASP.NET Roles
How to Restrict Access to Resources
Active Directory Security
Module 10 Review

Module 11 - Applying Master Pages and CSS
Lesson 1: Applying Master Pages
Challenges in Providing a Consistent UI
What is a Master Page?
Demo - Creating a Master Page
Demo - Using a Master Page in Web Forms and MVC View Pages
What are Nested Master Pages?
The Master Page Event Model and Relationships
Lesson 2: Applying CSS, Skins, and Themes
What are Cascading Style Sheets?
Demo - Creating a CSS File
CSS Features of Visual Studio
Overview of Themes and Control Skins
Module 11 Review

Module 12 - Developing Client-side Scripts and Services
Lesson 1: Developing Client-side Scripts
Client-side Code vs. Server-side Code
Creating a Client-side Script
Demo - Adding Client-side Script to the Page
Demo - Showing an Alert Box Using Client-side Code
ASP.NET Controls Using Client-side Script

Lesson 2: Implementing Ajax

Purpose of Ajax

Pros and Cons of Using Ajax

ScriptManager and UpdatePanel Controls in Microsoft Ajax Library

Demo - Using the UpdatePanel Control

Introduction to jQuery Library

Lesson 3: Creating Services

Web Services vs. Plain HTML Pages

Why Use Services?

Differences between ASMX Services and WCF Services

Creating WCF Services

Demo - Creating Ajax-enabled WCF Services & Invoking Ajax-enabled WCF Service Using Client-side Code

Calling Ajax-enabled WCF Service Using Client-side Code

Module 12 Review

Module 13 - Implementing Advanced Ajax in a Web Application 24m

Lesson 1: Implementing Ajax in ASP.NET MVC Pages Using Microsoft Ajax

Benefits of Using the Microsoft Ajax Library in MVC Pages

How to Use the Microsoft Ajax Library in MVC Pages

Lesson 2: Implementing Ajax in Asp.Net MVC Pages Using jQuery

jQuery.load Method

jQuery.get Method

jQuery.post Method

jQuery.ajax Method

Lesson 3: Working with jQuery and Ajax Events

Using the jQuery.ajaxSend() Event Handler

Using the jQuery.ajaxComplete Event Handler

Using the jQuery.ajaxError Event Handler

Demo - Working with jQuery Ajax Event Handlers

Module 13 Review

Module 14 - ASP.NET Deployments 23m

Lesson 1: Overview of Web Application Deployments

Web Deployment Packages

One-Click Publish

Enterprise Scenarios

Third-party Hosting Scenarios

Deploying a SQL Server Database

Extending the Web Publishing Pipeline

Extending the Web Publishing Platform: The Development Computer

Extending the Web Publishing Platform: The Web Server

Lesson 2: Overview of Website Deployments

The Copy Web Site Tool

The Publish Web Site Utility
Module 15 - Developing a Web Application by Using Silverlight 1h 36m

Lesson 1: Introduction to Rich Internet Applications
What Is an RIA?
RIAs vs. Rich Web Uis
Discussion: Exploring RIAs and Rich Web UIs

Lesson 2: Overview of Silverlight
What is Silverlight?
Architecture of Silverlight
What is XAML?
XAML Sample

Lesson 3: Creating a Silverlight Application
Demo - Creating the Silverlight Project Structure
Components of a Silverlight Application UI
How to Call Web Services in a Silverlight Application
Module 15 Review
Course Closure

Total Duration: 15h 58m