M4995: **Programming with the Microsoft .NET Framework Using Microsoft Visual Studio 2005** (5 Days)

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Introduction

This five-day instructor-led course enables developers who are migrating from a different development language, an earlier version of Visual Basic .NET or Visual C#, or who have completed entry-level training and experience using Microsoft Visual Studio 2005, to gain in-depth guidance on programming the Microsoft .NET Framework versions 2.0 and 3.0 with Visual Studio 2005.

After completing this course, students will be able to:

- Describe the .NET Framework.
- Create applications with Visual Studio 2005.
- Describe Visual Basic .NET and Visual C# language and syntax features.
- Use essential object-oriented programming features.
- Use advanced object-oriented programming features.
- Explain security in the .NET Framework.
- Access data by using ADO.NET.
- Build Windows Presentation Foundation applications.
- Describe distributed applications, and create distributed applications with Windows Communication Foundation.
- Monitor .NET Framework applications by using instrumentation.
- Compile, test, and deploy .NET Framework applications.
- Interoperate with unmanaged code (optional).
- Describe software design and development (optional).

Audience

The target audience for this course is developers who already have professional programming experience in C, C++, earlier versions of Visual Basic .NET or Visual C#, Java, or another programming language, and who plan to use Visual Studio 2005 to develop enterprise business solutions.

Prerequisites

Before attending this course, students must have:

- Professional experience with programming in C, C++, earlier versions of Visual Basic or C#, Java, or another programming language.
- Familiarity with the Microsoft .NET Framework strategy as described on the Microsoft .NET Homepage at http://www.microsoft.com/net.
- Familiarity with the .NET Framework versions 2.0 and 3.0 as described on the MSDN Developer Center site at http://msdn.microsoft.com/netframework/programming/fundamentals/default.aspx.

Microsoft Certified Professional Exams

No Microsoft Certified Professional exams are associated with this course currently.

Course Materials

The student kit includes a comprehensive workbook and other necessary materials for this class.

Course Outline

Module 1: Overview of the Microsoft .NET Framework

This module introduces the key features and components of the Microsoft .NET Framework 2.0. The module also provides an overview of Microsoft .NET Framework 3.0 technologies, and describes how they relate to version 2.0 of the .NET Framework.

Lessons

- Introduction to the .NET Framework

Module 8: Building Windows Presentation Foundation Applications

This module describes the key features of Windows Presentation Foundation and introduces Extensible Application Markup Language (XAML), the declarative language that can be used to define user interfaces. The module also introduces the Application object model, and describes how to program a Windows Presentation Foundation application.

- .NET Framework 3.0 Technologies

Lab 1: (There is no lab for this module)

After completing this module, students will be able to:

- Describe the key features of the .NET Framework.
- Describe the .NET Framework 3.0 technologies.

Module 2: Creating Applications with Visual Studio 2005

This module introduces the key features of the Visual Studio 2005 integrated development environment (IDE), and describes how to create and manage solutions, projects, and other resources. The module highlights many of the new features in Visual Studio 2005 that help to simplify and accelerate application development.

Lessons

- Introduction to Visual Studio 2005
- Managing Solutions and Projects
- Managing the Integrated Development Environment
- Writing Code with Visual Studio 2005

Lab 2: Creating Applications with Visual Studio 2005

- Creating a Windows Forms Application by Using Visual Studio 2005
- Locating and Fixing Errors by Using the Error List Window
- Creating and Using Code Snippets

After completing this module, students will be able to:

- Describe the key features of Visual Studio 2005.
- Manage solutions and projects.
- Manage the integrated development environment.
- Write code with Visual Studio 2005.

Module 3: Examining Language and Syntax Features

This module introduces fundamental language features in C# and Visual Basic, including variable declarations, control flow constructs, and

Lessons

- Introduction to Windows Presentation Foundation
- Introduction to XAML
- Programming Windows Presentation Foundation Applications

Lab 8: Building Windows Presentation Foundation Applications

- Creating a Windows Presentation Foundation Application
- Implementing the Code-Behind for the Application
- Testing the Application

After completing this module, students will be able to:

- Describe the key features of Windows Presentation Foundation.
- Describe and use XAML.
- Program Windows Presentation Foundation Applications.

Module 9: Creating Distributed Applications

This module introduces the concept of distributed applications, and shows how to create and consume XML Web services by using the .NET Framework and Visual Studio 2005. The module also covers the key features of Windows Communication Foundation, and explains how to build Windows Communication Foundation services and clients.

Lessons

- Overview of Distributed Applications
- Creating and Consuming XML Web Services
- Building Windows Communication Foundation Services and Clients

Lab 9: Creating Distributed Applications

- Creating and Consuming an XML Web Service
- Building a Windows Communication Foundation Service
- Building a Client for a Windows Communication Foundation Service

After completing this module, students will be able

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exception handling. The module also describes new language features introduced in Visual Studio 2005.

Lessons

- Syntax Basics
- Language Enhancements

Lab 3: Examining Language and Syntax Features

- Using Essential Language Constructs
- Handling Run-Time Errors
- Using Generic Collection Classes

After completing this module, students will be able to:

- Use fundamental language features in C# and Visual Basic, including variable declarations, conditional statements, loops, and exception handling.
- Use language enhancements introduced in Visual Studio 2005, including generics, partial types, and nullable types.

Module 4: Essentials of Object-Oriented Programming

This module introduces students to the essentials of object-oriented programming, defines important terminology, and shows the syntax for defining classes and creating instances.

Lessons

- Object-Oriented Programming Concepts
- Defining a Class
- Creating a Class Instance

Lab 4: Essentials of Object-Oriented Programming

- Creating a SalesPerson Class
- Creating and Using a SalesPerson Instance

After completing this module, students will be able to:

- Describe the key features of object-oriented programming.
- Define a class.
- Create a class instance.

to:

- Describe the options for creating distributed .NET Framework applications and the key features of Windows Communication Foundation.
- Create and consume XML Web services.
- Build Windows Communication Foundation services and clients.

Module 10: Monitoring .NET Framework Applications by Using Instrumentation

This module describes what instrumentation is, and shows how to perform instrumentation in .NET Framework applications by using code tracing and debugging, performance counters, and event logs.

Lessons

- Introduction to Instrumentation
- Code Tracing and Debugging
- Performance Counters
- Event Logs

Lab 10: Monitoring .NET Framework Applications by Using Instrumentation

- Adding Tracing to an Application
- Testing the Tracing Statements
- Adding Event Logging to an Application

After completing this module, students will be able to:

- Describe the key features of instrumentation in .NET Framework applications.
- Explain code tracing and debugging.
- Describe performance counters and explain how to use them.
- Describe event logs and explain how to write to an application event log.

Module 11: Compiling, Testing, and Deploying .NET Framework Applications

This module describes activities that take place in the final stages of application development, when building, testing, and deploying an application. The module describes how to use Microsoft tools to perform each of these activities.

Lessons

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Module 5: Advanced Object-Oriented Programming

This module describes how to use inheritance and interfaces. The module also introduces delegates and events, and describes how to use them in .NET Framework applications.

Lessons

- Advanced Object-Oriented Programming Concepts
- Implementing Inheritance
- Defining and Implementing Interfaces
- Creating and Using Delegates and Events

Lab 5: Advanced Object-Oriented Programming

- Creating a Base Class
- Creating Derived Classes
- Implementing an Interface
- Defining and Using Delegates and Events

After completing this module, students will be able to:

- Describe advanced object-oriented programming concepts.
- Implement inheritance.
- Define and implement interfaces.
- Create and use delegates and events.

Module 6: Security in the .NET Framework

This module introduces the concept of security, and describes how to use code access security and role-based security. The module also introduces the cryptographic services available in the .NET Framework.

Lessons

- Security Overview
- Implementing Code Access Security
- Implementing Role-Based Security
- Using Cryptographic Services

Lab 6: Security in the .NET Framework

- Implementing Code Access Security
- Implementing Role-Based Security

After completing this module, students will be able

- Introduction to Assemblies
- Overview of the Microsoft Build Engine (MSBuild)
- Testing .NET Framework Applications
- Deploying .NET Framework Applications by Using ClickOnce
- Deploying .NET Framework Applications by Using Windows Installer

Lab 11: Compiling, Testing, and Deploying .NET Framework Applications

- Delay Signing a Component Assembly
- Creating a Merge Module Project
- Deploying an Application by Using Windows Installer
- Installing and Testing the Application

After completing this module, students will be able to:

- Describe assemblies and explain features of assemblies that relate to deployment.
- Explain how to use MSBuild to build an application.
- Describe the key features of application testing.
- Deploy applications by using ClickOnce.
- Deploy applications by using Windows Installer.

Module 12: Interoperating with Unmanaged Code (Optional)

This module introduces the concept of interoperability with unmanaged code, and then describes how to access unmanaged functions and COM objects from managed code in a .NET Framework application.

Lessons

- Overview of Interoperability
- Calling Unmanaged Functions by Using Platform Invoke
- Calling COM Objects from Managed Code

Lab 12: Interoperating with Unmanaged Code

- Calling a Windows API from Managed Code
- Calling a COM Object from Managed Code

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to:

- Describe security in the .NET Framework.
- Implement code access security.
- Implement role-based security.
- Use the cryptographic services in the .NET Framework.

Module 7: Accessing Data by Using ADO.NET

This module describes how to access data programmatically in a relational database, by using ADO.NET. The module also describes how to read and write XML data, and introduces the classes in the XML Document Object Model (DOM).

Lessons

- Overview of Data Access
- Reading and Writing Relational Data
- Reading and Writing XML Data

Lab 7: Accessing Data by Using ADO.NET

- Creating and Running Simple Commands
- Creating and Running Query Commands
- Binding Data to Controls in a Form
- Reading and Writing a DataSet as XML Data

After completing this module, students will be able to:

- Describe the key features of data access in a .NET Framework application.
- Read and write relational data by using ADO.NET.
- Read and write XML data.

After completing this module, students will be able to:

- Describe the options for interoperating with unmanaged code from a .NET Framework application.
- Call unmanaged functions by using Platform Invoke.
- Call COM objects from managed code.

Module 13: Software Design and Development (Optional)

This module introduces software design and development and explains some of the most commonly used models and tools.

Lessons

- Introduction to the Software Development Life Cycle
- Introducing the Microsoft Solutions Framework
- Developing Applications with the Capability Maturity Model Integration
- Introducing Agile Software Development

Lab 13: Software Design and Development

- Managing a Software Development Process
- Discussion

After completing this module, students will be able to:

- Describe the software development life cycle.
- Describe the key features of the Microsoft Solutions Framework.
- Describe the development of applications with the Capability Maturity Model.
- Describe the key features of Agile Software Development.

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