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Syllabus: Microsoft .NET Training Course

The .NET Framework

- What is the .NET Framework?
- Common Language Runtime
- .NET Framework Class Library
- Assemblies and the Microsoft Intermediate Language (MSIL)
- Versions of the .NET Framework and Visual Studio

Getting Started with Visual Studio

- Visual Studio Overview
 - Choosing the Development Settings
 - Resetting the Development Settings
 - Creating a New Project
 - Components of the IDE
- Code and Text Editor
 - Code Snippets
 - IntelliSense
 - Refactoring Support
- Debugging
 - Setting Breakpoints
 - Stepping through the Code
 - Watching
 - Autos and Immediate Windows
- Unit Testing
 - Creating the Test
 - Running the Test
 - Testing with Floating Point Numbers
 - Adding Additional Test Methods

C# Language Foundations

- Using the C# Compiler (csc.exe)

- Passing Arguments to Main()
- Language Syntax
 - Keywords
 - Variables
 - Scope of Variables
 - Constants
 - Comments
- Data Types
 - Value Types
 - Reference Types
 - Enumerations
 - Implicit Typing
 - Type Conversion
- Operators
 - Arithmetic Operators
 - Logical Operators
 - Relational Operators
 - Increment & Decrement Operators
 - Bit Shift Operators
 - Assignment Operators
 - The is and as Operators
 - Other Operators
 - Operator Precedence
- Flow Control
 - if-else Statement
 - switch Statement
- Looping
 - for Loop
 - foreach
 - while and do-while Loops
 - Exiting from a Loop
 - Skipping an Iteration
- Structs
 - What Are Structs?
 - Structs Are Value Types
 - Assigning to a Struct
 - Constructors and Destructors
 - Instance Constructors
 - Static Constructors

- Summary of Constructors and Destructors
- Field Initializers Are Not Allowed
- Structs Are Sealed
- Boxing and Unboxing
- Structs as Return Values and Parameters

Arrays

- Single Dimensional Arrays
- Accessing Array Elements
- Multidimensional Arrays
- Arrays of Arrays: Jagged Arrays
- Parameter Arrays
- Copying Arrays

Strings and Regular Expressions

- The System.String Class
 - Escape Characters
 - String Manipulations
 - String Formatting
 - The StringBuilder Class
- Regular Expressions
 - Searching for a Match
 - More Complex Pattern Matching

OOPs Concepts

- Classes
 - Defining a Class
 - Creating an Instance of a Class (Object Instantiation)
 - Class Members
 - Access Modifiers
 - Function Members
 - Overloading Methods
 - Overloading Operators
 - Using Partial Classes
 - Static Classes
- System.Object Class
 - Implementing Equals
 - ToString() Method
 - Attributes
- Inheritance
 - Understanding Inheritance
 - Implementation Inheritance

- Inheritance and Constructors
- Calling Base Class Constructors
- Virtual Methods (Polymorphism)
- Sealed Classes and Methods
- Abstract Class
- Abstract Methods

- Interfaces
 - Defining an Interface
 - Implementing an Interface
 - Implementing Multiple Interfaces
 - Interface Inheritance
 - Overriding Interface Implementations

Collections Interfaces

- Dynamic Arrays Using the ArrayList Class
- Stacks
- Queues
- Dictionary
- Indexers and Iterators
- Implementing IEnumerable<T> and IEnumerator<T>
- Implementing Comparison Using IComparer<T> and IComparable<T>

Delegates and Events

- Delegates
 - Creating a Delegate
 - Delegates Chaining (Multicast Delegates)
 - Implementing Callbacks Using Delegates
 - Asynchronous Callbacks

- Events
 - Handling Events
 - Implementing Events
 - Difference between Events and Delegates
 - Passing State Information to an Event Handler

Generics

- Understanding Generics
- Generic Classes
- Using the default Keyword in Generics
- Advantages of Generics
- Using Constraints in a Generic Type
- Generic Interfaces
- Generic Methods
- Generic Operators

- Generic Delegates
- Generics and the .NET Framework Class Library
- System.Collections.ObjectModel

Exception Handling

- Handling Exceptions
 - Handling Exceptions Using the try-catch Statement
 - Handling Multiple Exceptions
 - Throwing Exceptions Using the throw Statement
 - Using Exception Objects
 - The finally Statement
- Creating Custom Exceptions

Threading

- Processes, AppDomains, and Object Contexts
 - Reviewing Traditional Win32 Processes
 - Interacting with Processes Under the .NET Platform
 - Understanding .NET Application Domains
 - Understanding Object Context Boundaries
- Threading
 - The Need for Multithreading
 - Starting a Thread
 - Aborting a Thread
 - Passing Parameters to Threads
- Thread Synchronization
 - Using Interlocked Class
 - Using C# Lock
 - Monitor Class
 - Using the BackgroundWorker Control
 - Testing the Application

Files and Streams

- Working with Files and Directories
- Working with Directories
- Working with Files Using the File and FileInfo Classes
- Creating a FileExplorer
- The Stream Class
 - BufferedStream
 - The FileStream Class
 - MemoryStream

Working with XML

- Introduction to XML
 - Markup
 - The Document Type Declaration (DTD)
 - Encoding Declaration
 - Writing XML Code using Code Editor
 - XML Syntax
- XML Reading & Writing
 - Text Writer Fundamentals
 - Text Reader Fundamentals
 - XmlDocument
- Serialization
 - Binary Serialization
 - XML Serialization

Assemblies and Versioning

- Assemblies
- Structure of an Assembly
- Examining the Content of an Assembly
- Single and Multi-File Assemblies
- Understanding Namespaces and Assemblies
- Private versus Shared Assemblies
- Creating a Shared Assembly
- The Global Assembly Cache
- Putting the Shared Assembly into GAC
- Making the Shared Assembly Visible in Visual Studio
- Using the Shared Assembly

Type Reflection, Late Binding, and Attribute-Based

- Programming
- The Necessity of Type Metadata
- Understanding Reflection
- Understanding Late Binding
- Building a Custom Metadata Viewer
- Dynamically Loading Assemblies
- Reflecting on Shared Assemblies
- Understanding Attributed
- Assembly-Level (and Module-Level) Attributes
- Reflecting on Attributes Using Early Binding
- Reflecting on Attributes Using Late Binding
- Putting Reflection, Late Binding, and Custom Attributes in Perspective

ADO.NET

- ADO .NET Introduction
 - ADO vs. ADO .NET
 - ADO .NET Architecture
- Connecting to Data Sources
 - Choosing a .Net Data Provider
 - Defining a Connection
 - Managing a Connection
 - Handling Connection Exceptions
 - Connection Pooling
- Performing Connected Database Operations
 - Working in a Connected Environment
 - Building Command Objects
 - Executing the Commands
 - Data Reader Object
- Using Transactions
- Performing Dis-Connected Database Operations
 - Configuring a DataAdapter to Retrieve Information
 - Populating a DataSet Using a DataAdapter
 - Modifying Data in a DataTable
 - Persisting Changes to a Data Source
 - Working in a Disconnected Environment
 - Building Datasets and DataTables
 - Binding and Saving a Dataset
 - Defining Data Relationships
- Reading and Writing XML with ADO.NET
 - Creating XSD Schemas
 - Loading Schemas and Data into DataSets
 - Writing XML from a DataSet

ASP.NET

- ASP.NET Introduction
 - The Evolution of Web Development
 - HTML and HTML Forms
 - Server-Side Programming
 - Client-Side Programming
 - Facts about ASP .NET
 - ASP .NET different versions
- Developing ASP.NET Applications
 - Creating Websites
 - Creating a New Web Application
 - Websites and Web Projects
 - The Hidden Solution Files
 - The Solution Explorer
 - Adding Web Forms

- Migrating a Website from a Previous Version of Visual Studio
- Designing a Web Page
 - Adding Web Controls
 - The Properties Window
- The Anatomy of a Web Form
 - The Web Form Markup
 - The Page Directive
 - The Doctype
- Writing Code
 - The Code-Behind Class
 - Adding Event Handlers
 - IntelliSense and Outlining
- Visual Studio Debugging
 - The Visual Studio Web Server
 - Single-Step Debugging
 - Variable Watches

Creating N-Tier Applications

- Multi-Tier Architectures
- Creating an N-Tier ASP.NET Application
- The Data Tier
- The Middle Tier
- The Presentation Tier
- Managing Concurrency

Web Form Fundamentals

- The Anatomy of an ASP.NET Application
 - ASP.NET File Types
 - ASP.NET Application Directories
- Introducing Server Controls
 - HTML Server Controls
 - Converting an HTML Page to an ASP.NET Page
- A Deeper Look at HTML Control Classes
 - HTML Control Events
 - Advanced Events with the HtmlInputImage Control
 - The HtmlControl Base Class
 - The HtmlContainerControl Class
 - The HtmlInputControl Class
- The Page Class
 - Sending the User to a New Page
 - HTML Encoding
- Application Events
 - The Global.asax File
 - Additional Application Events
- ASP.NET Configuration

- The web.config File
- Nested Configuration
- Storing Custom Settings in the web.config File
- The Website Administration Tool (WAT)

Web Controls

- Stepping Up Web Controls
 - Basic Web Control Classes
 - The Web Control Tags
- Web Control Classes
 - The WebControl Base Class
 - Units
 - Enumerations
 - Colors
 - Fonts
 - Focus
 - The Default Button
- List Controls
 - Multiple-Select List Controls
 - The BulletedList Control
- Table Controls
- Web Control Events and AutoPostBack
 - How Postback Events Work
 - The Page Life Cycle
- A Simple Web Page
 - Improving the Greeting Card Generator
 - Generating the Cards Automatically

Validation

- Understanding Validation
 - The Validator Controls
 - Server-Side Validation
 - Client-Side Validation
- The Validation Controls
 - A Simple Validation Example
 - Other Display Options
 - Manual Validation
 - Validating with Regular Expressions
 - A Validated Customer Form
 - Validation Groups

The Data Controls

- The GridView
 - Automatically Generating Columns
 - Defining Columns

- Formatting the GridView
 - Formatting Fields
 - Using Styles
 - Formatting-Specific Values
- Selecting a GridView Row
 - Adding a Select Button
 - Editing with the GridView
- Sorting and Paging the GridView
 - Sorting
 - Paging
- Using GridView Templates
 - Using Multiple Templates
 - Editing Templates in Visual Studio
 - Handling Events in a Template
 - Editing with a Template
- The DetailsView and FormView
 - The DetailsView
 - The FormView

Rich Controls

- The Calendar
 - Formatting the Calendar
 - Restricting Dates
- The AdRotator
 - The Advertisement File
 - The AdRotator Class
- Pages with Multiple Views
 - The MultiView Control
 - The Wizard Control

Files and Streams

- Files and Web Applications
- File System Information
 - The Path Class
 - A Sample File Browser
- Reading and Writing with Streams
 - Text Files
 - Binary Files
 - Shortcuts for Reading and Writing Files
 - A Simple Guest Book
- Allowing File Uploads
 - The FileUpload Control

State Management

- The Problem of State

- View State
 - The ViewState Collection
 - A View State Example
 - Making View State Secure
 - Retaining Member Variables
 - Storing Custom Objects
- Transferring Information between Pages
 - Cross-Page Posting
 - The Query String
- Cookies
 - A Cookie Example
- Session State
 - Session Tracking
 - Using Session State
 - A Session State Example
- Session State Configuration
 - Cookieless
 - Timeout
 - Mode
- Application State
- An Overview of State Management Choices

Error Handling, Logging, and Tracing

- Common Errors
- Exception Handling
 - The Exception Class
 - The Exception Chain
- Handling Exceptions
 - Catching Specific Exceptions
 - Nested Exception Handlers
 - Exception Handling in Action
 - Mastering Exceptions
- Throwing Your Own Exceptions
- Logging Exceptions
 - Viewing the Windows Event Logs
 - Writing to the Event Log
 - Custom Logs
 - A Custom Logging Class
 - Retrieving Log Information
- Error Pages
 - Error Modes
 - Custom Error Pages
- Page Tracing
 - Enabling Tracing
 - Tracing Information

- Writing Trace Information
- Application-Level Tracing

Deploying ASP.NET Applications

- ASP.NET Applications and the Web Server
 - How Web Servers Work
 - The Virtual Directory
 - Web Application URLs
 - Web Farms
- Internet Information Services (IIS)
 - The Many Faces of IIS
 - Installing IIS 5 (in Windows XP)
 - Installing IIS 7 (in Windows Vista)
 - Registering the ASP.NET File Mappings
 - Verifying That ASP.NET Is Correctly Installed
- Managing Websites with IIS Manager
 - Creating a Virtual Directory
 - Configuring a Virtual Directory
- Deploying a Simple Site
 - Web Applications and Components
 - Other Configuration Steps
 - Code Compilation
 - The ASP.NET Account
- Deploying with Visual Studio
 - Creating a Virtual Directory for a New Project
 - Copying a Website
 - Publishing a Website

User Controls and Graphics

- User Controls
 - Creating a Simple User Control
 - Independent User Controls
 - Integrated User Controls
 - User Control Events
 - Passing Information with Events
- Dynamic Graphics
 - Basic Drawing
 - Drawing a Custom Image
 - Placing Custom Images Inside Web Pages
 - Image Format and Quality

Caching

- Understanding Caching
 - When to Use Caching
 - Caching in ASP.NET

- Output Caching
 - Caching on the Client Side
 - Caching and the Query String
 - Caching with Specific Query String Parameters
 - A Multiple Caching Example
 - Custom Caching Control
 - Fragment Caching
 - Cache Profiles
- Data Caching
 - Adding Items to the Cache
 - A Simple Cache Test
 - Caching to Provide Multiple Views

Styles, Themes, and Master Pages

- Styles
 - Style Types
 - Creating a Basic Inline Style
 - Creating a Style Sheet
 - Applying Style Sheet Rules
- Themes
 - How Themes Work
 - Applying a Simple Theme
 - Handling Theme Conflicts
 - Creating Multiple Skins for the Same Control
 - More Advanced Skins
- Master Page Basics
 - A Simple Master Page and Content Page
 - How Master Pages and Content Pages Are Connected
 - A Master Page with Multiple Content Regions
 - Default Content
 - Master Pages and Relative Paths
- Advanced Master Pages
 - Table-Based Layouts
 - Code in a Master Page
 - Interacting with a Master Page Programmatically

Website Navigation

- Site Maps
 - Defining a Site Map
 - Seeing a Simple Site Map in Action
 - Binding an Ordinary Page to a Site Map
 - Binding a Master Page to a Site Map
 - Binding Portions of a Site Map
 - The SiteMap Class
 - Mapping URLs

- The SiteMapPath Control
 - Customizing the SiteMapPath
 - Using SiteMapPath Styles and Templates
 - Adding Custom Site Map Information
- The TreeView Control
 - TreeView Properties
 - TreeView Styles
- The Menu Control
 - Menu Styles
 - Menu Templates

Creating and Using Web Services

- Understanding the Web Service Model
- Creating an ASP.NET Web Service
- WSDL and Web Service Clients
- Creating & Consuming Web Services with Visual Studio .NET

Security Fundamentals

- Determining Security Requirements
- The ASP.NET Security Model
 - The Visual Studio Web Server
 - Authentication and Authorization
- Forms Authentication
 - Web.config Settings
 - Authorization Rules
 - The WAT
 - The Login Page
- Windows Authentication
 - Web.config Settings
 - IIS Settings
 - A Windows Authentication Test
- Impersonation
 - Understanding Impersonation
 - Programmatic Impersonation
- Confidentiality with SSL
 - Creating a Certificate Request
 - Secure Sockets Layer

Membership

- The Membership Data Store
 - Membership with SQL Server
 - Using the Full Version of SQL Server
 - Configuring the Membership Provider
 - Creating Users with the WAT
 - The Membership and MembershipUser Classes

- Authentication with Membership
- Disabled Accounts
- The Security Controls
 - The Login Control
 - The CreateUserWizard Control
 - The PasswordRecovery Control
- Role-Based Security
 - Creating and Assigning Roles
 - Restricting Access Based on Roles
 - The LoginView Control

Profiles

- Understanding Profiles
 - Profile Performance
 - How Profiles Store Data
- Using the SqlProfileProvider
 - Enabling Authentication
 - Using the Full Version of SQL Server
 - The Profile Databases
 - Defining Profile Properties
 - Using Profile Properties
 - Profile Serialization
 - Profile Groups
 - Profiles and Custom Data Types
 - The Profile API
 - Anonymous Profiles

ASP.NET AJAX

- Understanding Ajax
 - Ajax: The Good
 - Ajax: The Bad
 - The ASP.NET AJAX Toolkit.
 - The ScriptManager
- Partial Refreshes
 - A Simple UpdatePanel Test
 - Handling Errors
 - Conditional Updates
 - Triggers
- Progress Notification
 - Showing a Simulated Progress Bar
 - Cancellation
 - Timed Refreshes
- The ASP.NET AJAX Control Toolkit
 - Installing the ASP.NET AJAX Control Toolkit

.NET Version 4.0

- Implicitly Typed Local Variables and Arrays
- Object Initializers
- Collection Initializers
- Extension Methods
- Anonymous Types
- Lambda Expressions
- Query Keywords
- Auto-Implemented Properties
- Language-Integrated Query (LINQ)
- dynamic data type
- Named Parameters

Windows Communication Foundation

- WCF Essentials
 - WCF Overview
 - SOA Overview
 - WCF architecture
 - Essential WCF concepts:
 - Addresses
 - Contracts
 - Bindings
 - Endpoints
 - Hosting
 - Clients
- Contracts
 - Designing and working with service contracts
 - Contract overloading and inheritance
 - Data Contracts
 - Serialization
 - Attributes
 - Versioning
 - Collections & Generics
- Instance Management & Operation
 - Behaviors
 - Per-Call Services
 - Per-Session Services
 - Singleton Service
 - Demarcating Operations
 - Instance Deactivation
 - Throttling
 - Operations
 - Request-Reply
 - One-Way
 - Callback

- Events
 - Streaming
- Faults
 - Errors and exceptions
 - Fault Contracts
 - Error handling Extensions
- Transactions
 - Transaction Propagation
 - Protocols and Managers
 - The Transaction Class
 - Declarative Programming
 - Explicit Transaction Programming
 - With Instance management
 - Callbacks
- Security
 - Authentication & Authorization
 - Transfer Security
 - Scenario-Driven Approach
- Concurrency Management
 - Service Concurrency Mode
 - Instance Management and Concurrency
 - Deadlocked Avoidance
 - Synchronization Context
 - Callbacks

Project

- A project using .NET programming has to be developed by participant as a mandatory requirement of this course.

ASP.NET MVC