MCTS Syllabus

Windows Application Development With

Microsoft .NET Framework 4.0

(C# Programming & WPF)

Course Details:

- **Duration: 10 Days (3 Hours Daily).**
- **Certificates: MCTS – WPF**
- **Exams: 70-511**

Part 1 (C# Fundamentals)

Module 1: Introduction :

- NET Framework Overview:
  - Common Language Specification – CLS.
  - Common Language Runtime – CLR
  - Framework Class Library - FCL (Base Class Library - BCL).
- C# Overview.

Module 2: Comments and Variables and Data Types:

- Comments.
- Variables:
  - Identifier.
  - Notation Types.
- Data Types :
  - Value Types.
  - Reference Types.
- Variable Declaration.
- Constant and Readonly.
- Nullable Types.
- Conversion Types:
  - Implicit Conversion:
    - Widening Conversion.
    - Narrowing Conversion.
  - Explicit Conversion :
    - Casting.

- Convert Command.
- Using Parse.
- Using ToString Method.

- Boxing and Unboxing

Module 3: Output and Input Operations :

- NameSpace:
  - System NameSpace.
  - Console Class.
- Output Operations:
  - Write Method.
  - WriteLine Method.
- Escape Sequence.
- Text and Numeric Formatting.
- Input Operations:
  - Read Method.
  - ReadLine Method
- Using MessageBox with Console Application.

Module 4: Operators :

- Primary Operators.
- Arithmetic Operators.
- Decrement and Increment Operators.
- Assignment Operators.
- Relational Operators.
- Logical Operators.

Module 5: Control Structures : Control Statements :

- Selection Structures:
  - if Selection Structure.
  - if/else Selection Structure.
  - Multiple-Selection Structure.
  - Switch Multiple-Selection Structure.
- Repetition Structures :
  - for Repetition Structure.
  - while Repetition Structure.
  - do/while Repetition Structure.
  - Foreach Repetition Structure.
- Jump Statements :
  - break Statement.
  - continue Statement.
  - goto Statement.
  - return Statement

Module 6: Methods and Parameters :

- General Syntax.
- Access Modifiers.
- Static and non-static Methods:
  - Static and non-static Methods Definition.
  - Static and non-static Methods Calling.
- Void and return value Methods:
  - Void and Return Value Methods Definition.
  - Void and Return Value Methods Calling.

- ❖ Passing Arguments:
  - Pass-by-Value.
  - Pass-by-Reference.
  - Using out.
- ❖ Recursion.
- ❖ Methods Overloading.

Module 7: Arrays :

- ❖ One Dimensional Array:
  - Declaring One Dimensional Array.
  - Initialization One Dimensional Array.
  - Printing One Dimensional Array.
  - One Dimensional Array Property (length).
- ❖ Two Dimensional Array :
  - Declaring Two Dimensional Array.
  - Initialization Two Dimensional Array.
  - Printing Two Dimensional Array.
  - Tow Dimensional Array Properties.
- ❖ Passing Array to Methods.
- ❖ Passing Array Elements to Methods.
- ❖ Using params Keyword.
- ❖ Array Class:
  - Introduction to Array Class.
  - Array Class Methods.
- ❖ Jagged Array.
- ❖ Using foreach Repetition Structure with Array.

Module 8: Structure and Enumeration :

- ❖ Structure :
  - Structure Definition.
  - Working with structure.
  - DateTime Structure.
- ❖ Enumeration :
  - Enumeration Definition.
  - Working with enumeration.

Module 9: Object-Based Programming : Part 1:

- ❖ Built-In Classes:
  - Math Class.
  - String Class.
  - Random Class.
- ❖ User Defined Classes:
  - User-Defined Class Definition.
  - Access Modifiers.
  - Static Class vs. non-static Class.
  - Class Contents:
  - Instance Variables:
  - Static Class Members.
  - Non-static Class Members.
- ❖ Constructors:
  - Constructors Overview.
  - Using this Reference with Constructors.
  - Using Overloaded Constructors.

- Using Overloaded Constructors by Using This.

❖ Destructors ,Finalize Method and Garbage Collector.

❖ Properties.

❖ Operator Overloading.

Module 10: Object-Based Programming : Part 2

❖ Partial Class.

❖ Nested Classes.

❖ Generics.

❖ Indexers.

Module 11: Object-Oriented Programming :

❖ Inheritance:

- Single Inheritance.
- Multi-Level Inheritance.
- Is Operator.
- Relations Between Classes.
- Class Diagram.

❖ Interfaces:

- Creating an Interface.

❖ Abstract Classes and Methods.

❖ sealed Classes.

❖ Polymorphism.

Module 12: Delegate and Event :

❖ Delegates:

- Understanding the Delegate.
- Working with Delegate.

- Anonymous Methods.

❖ Events.

Module 13: Error Types :

❖ Error types.

❖ Syntax Error Overview.

❖ Runtime Errors :

- Runtime Errors Overview.
- Try-catch-finally Technique.
- Exception Class.

❖ Working with Exception Handling.

❖ Logical Errors:

- Logical Errors Overview.
- Using break point.

Module 14: Class Library:

❖ Class Library Overview.

❖ Create class library.

❖ Working with class library.

Part 2 (Windows Presentation Foundation / WPF)

Module 1: Building a User Interface

- Using WPF Controls
- WPF Controls Overview
- Content Controls
- Other Controls
- Setting the Tab Order for Controls
- Item Controls
- *ListBox* Control
- *ComboBox* Control
- *TreeView* Control and *TreeViewItem* Control
- Menus
- *ToolBar* Control
- *StatusBar* Control
- Layout Controls
- Control Layout Properties
- Using Attached Properties
- Layout Panels
- Accessing Child Elements Programmatically
- Aligning Content
- Using Resources
- Using Binary Resources
- Content Files
- Using Logical Resources
- Creating a Resource Dictionary
- Retrieving Resources in Code
- Lesson 3: Using Styles and Triggers

- Using Styles
- Triggers
- Understanding Property Value Precedence

Module 2: Working with Events and Commands

- Configuring Events and Event Handling
- Types of Routed Events
- RoutedEventArgs
- Attaching an Event Handler
- The *EventManager* Class
- Defining a New Routed Event
- Creating a Class-Level Event Handler
- Application-Level Events
- Lesson 2: Configuring Commands
- A High-Level Procedure for Implementing a Command
- Invoking Commands
- Command Handlers and Command Bindings
- Creating Custom Commands
- Implementing Animation
- Using Animations

Module 3: Adding and Managing Content

- Managing the Visual Interface
- Brushes
- Shapes
- Transformations
- The Visual Tree
- Adding to and Removing Controls from the
- Visual Interface at Run Time
- Adding Multimedia Content

- Using *SoundPlayer*
- *MediaPlayer* and *MediaElement*
- Handling Media-Specific Events

Part 3 (Advanced C# Fundamentals)

Module 1: Input / Output (I/O) :

- ❖ File System Classes :
- ❖ Informational Classes :
  - FileInfo Class.
  - DirectoryInfo Class.
  - DriveInfo Class.
- ❖ Utility Classes :
  - Path Class.
  - File Class.
  - Directory Class.
  - File System Watcher.
- ❖ Reading and writing files :
  - FileStream.
  - BinaryWriter & BinaryReader.
  - MemoryStream.
- ❖ Compression Streams :
  - File Compression.
  - File Decompression.

Module 2: Searching, Modifying and Encoding Text :

- ❖ Searching.
- ❖ Regular Expression :
  - Introduction to Regular Expression.
  - Regular Expression Characters.
  - Working with Regular Expression.
- ❖ Encoding and decoding :
  - Encoding Types.
  - Encoding Class.
  - Specify the Encoding Type When Writing into File.
  - Specify the Encoding Type When Reading a File.

Module 3: Collections and Generics :

- ❖ Collecting Data Items :
  - ArrayList.
  - Working with Sequential Lists :
  - Queue.
  - Stack.
  - Working with dictionaries :
  - HashTable.
  - SortedList.
  - Working with Bits :
- ❖ Generic collections :
  - List.
  - Queue.
  - Stack.
  - HashTable.

- SortedList.
- Generic LinkedList.

Module 4: Serialization :

❖ Introduction to Serialization :

- What Is Serialization?
- Serializing objects:

❖ Binary Formatter:

- How to Serialize an Object.
- How to Deserialize an Object.

❖ Soap Formatter :

- How to Serialize an Object.
- How to Deserialize an Object.

❖ XML Serialization :

- How to Use XML to Serialize an Object.
- How to Use XML to Deserialize an Object.

Module 5: Threading :

❖ Introduction to Threads.

❖ Life Cycle of the Thread.

❖ Delegates & Threads.

❖ Creating Threads :

❖ Creating a Simple thread.

❖ Using Thread.Join.

❖ Thread Priority.

- Passing Data to Threads.
- Stopping Threads.
- Multithreading.

Module 6: Application Domains and Services :

- Introduction to application domains :
  - What Is an Application Domain?
  - Creating application domains.

Module 7: Installing and Configuring Applications :

- Creating an Installer.
- Configuration Settings.

Module 8: Instrumentation :

- Logging Events :
  - Creating an Event Log.
  - Deleting an Event Log.
  - Writing to an Event Log.
- Performance.
- Detecting Management Events :
  - Enumerating Logical Drives.
  - Retrieve Information about Services that Are Paused.
  - Enumerating Network Adapters.

Module 9: Application Security :

- Understanding Code Access Security :
  - What Is Code Access Security?
  - What Is Evidence?

- What Is a Permission?
- What Is a Permission Set?
- What Are Code Groups?

❖ Using Declaration Security to Protect Assembles :

- How to Create Assembly Declarations.

Module 10: User and Data Security :

❖ Authenticating and Authorizing Users:

- WindowsIdentity Class.
- WindowsPrincipal Class.

❖ Encryption and Decryption Data :

- Understanding encryption and decryption algorithms.
- Encrypting and Decrypting Data with Symmetric Keys.

Module 11: Interoperation :

❖ Introduction to Interoperation.

❖ Using COM Objects :

- Importing Type Libraries.
- Using a COM Application From .NET.

❖ Exposing .NET Component to COM :

- Building .NET Components for Use by COM.
- Hiding Public .NET Classes from COM.

❖ Using Unmanaged Code :

- Calling Platform Invoke.

Module 12: Reflection :

❖ Understanding reflection :

- Examining an Assembly.

❖ Reflecting Types :

- Getting Types.

Module 13: Mail :

❖ Creating Mail Message.

❖ Sending Mail Message.

❖ How to Attach Files.

Module 14: Globalization :

❖ Using Culture Information :

- CultureInfo Class.
- RegionInfo Class.

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MCTS Syllabus

Microsoft .NET Framework 4.0, ADO.NET Application Development

Course Details:

- **Duration: 10 Days (3 Hours Daily).**
- **Certificates: MCTS – Data Access.**
- **Exams: 70-516**

The MCTS Certification

- **MCTS - Microsoft .NET Framework 4.0, ADO.NET Application Development**

Module1 Creating Database Connections

- Connecting to a Data Source
- Using Data Providers and More Complex Connection Scenarios
- Working with Multiple Active Result Sets

Module 2: Selecting and Querying Data

- Building Command Objects
- Consuming Data

Module 3: DataSets

- Introduction to DataSets
- Working with Typed DataSets

Module 4: Updating Data

- Updating Data
- Data Integrity and Transactions

Module 5: Synchronizing Data

- Caching Data
- Microsoft Sync Framework

Module 6: Introducing LINQ

- Constructing Queries with LINQ
- Shaping Results with LINQ

Module 7: XML

- DataSets and XML
- Querying XML with LINQ

Module 8: LINQ to SQL

- Introduction to LINQ to SQL
- Updating Data

- Using Stored Procedures

Module 9: Using the Entity Framework

- ❖ Generating and Querying an Entity Data Model

Module 10: ADO.NET Data Services

- ❖ Exposing the Data Service
- ❖ Consuming the Data Service