WPF+MVVM+Prism

Overview: WPF (Windows Presentation Foundation) is for building aesthetic applications with very advanced Look and feel features. The WPF engine is responsible for creating, displaying and manipulating user-interfaces, documents, images, movies and media in **"Rich UI Windows Applications"**. It replaces Winform API which was traditionally used for developing GUI in windows based application. The architecture used for development is very much inspired from ASP.NET WebForms where design (in XAML file) is separated from code (in .cs file). This is the reason the design can be independently created in some tool like Microsoft Expression Blend and coding can be done using Visual Studio IDE.

Course Objectives: This course will allow learners to

- ❖ Understand the features of WPF and role of XAML in building RICH Windows Applications.
- ❖ Understand the XAML Advantages,Features and Role Of XAML In Building RICH Windows Applications.
- ❖ Create sophisticated GUI using Layouts.
- ❖ Build sophisticated GUI using WPF Control. Menu and Status Bar.
- ❖ Understand the Embed WPF controls in a WinForms application or WinForms controls in a WPF application.
- ❖ Understand the Event Handling
- ❖ Understand the Built-in Commands and Custom Commands.
- ❖ Change Look and Feel using custom styles.
- ❖ Learn about the types of brushes,Static & Dynamic resources and Scope of Resources.
- ❖ Reuse UI using Templates.
- ❖ Learn about the Reusable User controls and Custom Controls.
- ❖ Explore WPF Data Binding Controls like GridView and more…
- ❖ Deal with fixed and flow documents.
- ❖ Managing animations and media.
- ❖ Navigation Applications and XBAPs.
- ❖ Learn about the asynchronous programming patterns.
- ❖ Logically and physically structuring WPF applications according to MVVM pattern
- ❖ Learn how to use Prism Patterns using project in WPF
- ❖ Learn about the creation of automated tests for the User Interface.
- ❖ Learn about the Security features of an applications.

Target Audience: This WPF course is for newbies, although prior programming knowledge is required. If you want to kick-start your desktop app building knowledge this course is the course for you.

Pre-requisite: Before joining the WPF, learners should have good knowledge of C# programming and should have at least startup experience in developing GUI applications using Winforms. Knowledge of ADO.NET though is not necessary, but will be an added advantage

Module 1: Introduction

In this module, You will learn about the Different layers of WPF Architecture, Types of WPF Applications, Features of WPF, Control Hierarchy and Steps for installation.

- ❖ What is WPF?
- ❖ Goals, Benefits & Drawbacks
- ❖ First WPF Application
- ❖ Types of WPF Application (Windows Based and Browser Based)
- ❖ WPF Architecture – Content Model
- ❖ Versions of WPF
- ❖ Installation

Module 2: XAML – Extensible Application Markup Language.

In this module, You will learn about the BAML, how to create an application user interface using XAML, Advantages of XAML, Features and Role Of XAML In Building RICH Windows Applications.

- ❖ Overview
- ❖ Advantage
- ❖ XAML vs Code
- ❖ Properties and Elements
- ❖ Implicit Type Conversion
- ❖ Markup Extensions
- ❖ Namespaces
- ❖ Attached Properties and Attached Events
- ❖ Case and Whitespace in XAML

Module 3: Layout Controls

In this module, You will learn about the how to arrange a group of GUI elements in your application and Understanding how and when layout calculations occur is essential for creating user interfaces in WPF..

- ❖ Border

- ❖ Canvas
- ❖ DockPanel
- ❖ Grid
- ❖ StackPanel
- ❖ UniformGrid
- ❖ WrapPanel
- ❖ Viewbox
- ❖ ScrollViewer
- ❖ Common Layout Properties

Module 4: Controls & Menus

In this module, You will learn about the sophisticated GUI using WPF Controls and enables you to create visually enhanced user interfaces for your applications. Even the typical controls you're used to seeing in a standard Windows Forms application are enhanced in WPF applications..

- ❖ Content Controls: Button, CheckBox, RadioButtom, RepeatButton, ToggleButton, ToolTip, Explander, GroupBox
- ❖ Text Controls: TextBox, TextBlock, RichTextBox, PasswordBox, Label
- ❖ List Controls: ComboBox, ListBox, StatusBar, TabControl, Toolbar, TreeView, ListView**,** Menu
- ❖ Shapes Control: Rectangle, Ellipse, Line, Polyline, Polygon
- ❖ Media Controls: Image, InkCanvas, ViewBox, MediaElement, Web-Browser
- ❖ Windows Forms Host: NotifyIcon, DateTimePicker,
- ❖ Misc Controls: Progress Bar, Slider, ScrollBar, Separator, GridSplitter

Module 5:-- Interoperability-WindowsAndWPF

In this module, You will learn about the Embed WPF controls in a WinForms application or WinForms controls in a WPF application.

Module 6: Events

In this module, You will learn about the WPF life cycle events, how routed events are routed through a tree of elements, summarizes how you handle routed events, and introduces how to create your own custom routed events..

- ❖ WPF Life Cycle Events
- ❖ Mouse Events
- ❖ Keyboard Input
- ❖ Routed Events in WPF

❖ Custom Routed Events

Module 7: Commands

In this module, You will learn about the how to use commands, how to bind a command and how to implement the Routed Commands.

❖ Built-In commands

❖ Custom Commands

❖ Routed Commands

Module 8: Styles

In this module, You will learn about the WPF styles works just like CSS style, In the CSS we define styles for a control and we reuse the same where ever we need in the application, same way the styles in WPF allows to define the properties and can be reused in the application.

❖ Styles Overview

❖ Advantages of Styles

❖ Style Class Properties

❖ Declaring Styles

❖ Applying Styles

❖ Style Inheritance

❖ Triggers

Module 9: Resources & Themes

In this module, You will learn about the how to reuse the resources in different places of application.Resoures includes the different types of brushes and types of resources.

❖ Types of Brushes

❖ Using brush as a Resource

❖ Using Resource for Styles

❖ Scope of Resources

❖ Static and Dynamic Resources

❖ Resource Dictionary

❖ Resource Library

Module 10: Control Templates

In this Module, You will learn about the how to change look and feel of the control by using Control Templates,

Event Handling using Triggers and how changing Styles is different from Changing Template .

- ❖ Introduction
- ❖ Visual vs Logical Tree
- ❖ Template and Style difference
- ❖ Changing Template
- ❖ Content Presenter
- ❖ Trigger
- ❖ Template Binding
- ❖ Data Binding
- ❖ Template as resource
- ❖ Applying Template using Style

Module 11: Dependency Property

In this Module, You will learn about the how to use existing dependency properties in XAML and in code.

Introduces specialized aspects of dependency properties, such as dependency property metadata, and how to

create your own dependency property in a custom class.

Module 12: User Control

In this module, You will learn about the how to create re-usable user control, which exposes bindable properties in

WPF and Develping Custom controls.

- ❖ Introduction
- ❖ Developing UserControl
- ❖ Using UserControl
- ❖ Custom Control

Module 13: Data binding

In this module, You will learn about the how to establish a connection between the application UI and business

logic, how to display a list of data items and how to display a list of data items in tabular format.

- ❖ Data Binding
  - ❖ Overview
  - ❖ What is Databinding?
  - ❖ Databinding syntax

- ❖ Data Binding to Custom Objects
- ❖ Multibinding/Formatted String
- ❖ Data Binding to Collection of Object
- ❖ Programming with CollectionView
- ❖ Validating items
- ❖ Data Template
- ❖ XML Data Provider
- ❖ Object Data Provider
- ❖ Grid View and Data Grid

Module 14: Documents

In this module, You will learn about the building application with advanced document features and an improved adding experience.

- ❖ Fixed Documents
- ❖ Flow Documents
- ❖ Document Controls

Module 15: Animations

In this module, You will learn about the overview of the animations and timing system, Focuses on the animation of WPF objects by using storyboards, how to apply visual effects and how to use the 2-D Transform classes to rotate, scale, move (translate), and skew FrameworkElement objects. .

- ❖ Animation Fundamentals
  - ❖ Animation Overview
  - ❖ Steps to Animate and Element
  - ❖ Managing Storyboard Programmatically
  - ❖ Accelerate or Decelerate an Animation
  - ❖ Types of Animation
- ❖ Bitmap Effects
  - ❖ Bitmap Effects classes
  - ❖ Bitmap Effect Group
  - ❖ Animating Bitmap Effect
- ❖ Transformations
  - ❖ Transformation classes
  - ❖ Applying Transformation

❖ Animating Transformation

Module 16: Navigation-Based Applications

In this module, You will learn about the browser style navigation that can be used in two types of applications and Features in Navigation Support(Navigation Service,Page&Hyperlink).

❖ Page

❖ Hyperlink Navigation

❖ Navigation Service

❖ Frame

Module 17: XBAP Application

In this module, You will learn about the simple, high-level introduction to XBAP development and describes where XBAP development differs from standard rich-client development.

❖ Navigation Techniques

❖ Navigation Service Events

❖ Remembering Navigation with the Journal

❖ Page Lifetime and the Journal

❖ Cookies

Module 18: Implementing asynchronous programming patterns

In this module, You will learn about the how to implement the asynchronous programming patterns,Parallel programming using async & await keywords.

❖ Freezing UI elements

❖ Using timers

❖ Task parallel library

❖ Parallel LINQ

❖ Using the dispatcher

❖ BackgroundWorker component

Module 19: MVVM

In this module, You will learn about the what is MVVM, why to use it, when to use MVVM , Connecting Views & ViewModels ,Logically and physically structuring applications according to MVVM pattern

❖ What is View,View-Model,Model

❖ Benefits of MVVM

❖ Connecting View-Models to View

- ❖ MVVM Commands
- ❖ Example on MVVM pattern

Module 20: Prism+project

In this module, You will learn about the how to develop the application in a modular fashion, how to implement the MVVM patterns using Prism Library.

- ❖ Overview of Prism
- ❖ Benefits of Prism
- ❖ ContactsManager Project Using Prism+MVVM

Module 21: Implement a WPF test strategy

In this module, You will learn about the creation of automated tests for the User Interface by using UI automation provider and how does UI automations works.

- ❖ Automation peer
- ❖ UI automation
- ❖ IntelliTrace

Module 22: Implement security features of an application

In this module, You will learn about the Security models for Windows Presentation Foundation (WPF) standalone and browser-hosted applications.

- ❖ Configuring Software Restriction Policy (SRP)
- ❖ Full trust and partially trusted security
- ❖ User Account Control (UAC)

At the end of the course participants will be able to

1. You will have a better understanding of WPF Architecture.
2. Understand the XAML Advantages,Features and Role Of XAML In Building RICH Windows Applications.
3. Create sophisticated GUI using WPF Controls and Layouts.
4. You will have a better understanding of Event handling and life cycle events.
5. Embed WPF controls in a WinForms application or WinForms controls in a WPF application.
6. Change Look and Feel using custom styles and resources.
7. Reuse UI using User Control.
8. WPF Data Binding Controls like GridView,Listview.
9. Build the application by using advanced document features.

10. Manage the animations and media.

11. Build the browser style navigation applications.

12. You will have a better understanding of asynchronous programming patterns.

13. You will have a better understanding of MVVM Pattern Architecture(design pattern).

14. You will have a better understanding of Prism Patterns.

15. Create automated tests for the User Interface.

16. You will have a better understanding of Security models for Windows Presentation Foundation (WPF) standalone and browser-hosted applications.