Revit API + Dynamo
Language: **CSharp**

Training Structure

Module 1: **CSharp Programming**
Module 2: **Revit API + Dynamo**.

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Features:

- ✓ Personal coaching - no recorded videos.
- ✓ Flexible timings, weekend batches are also conducted.
- ✓ CSharp programming – indepth training included.
- ✓ Unlimited support after training - at no extra cost!

Training Highlights

Online Training   Flexible Timings   Trainer: 25 yrs Exp.   Duration: 6 Wks   1 Hour Daily

Basic to Advanced   10 Industry Projs   Certificate   Support after Training   CuttingEdge Tech

Module 1: CSharp Programming

1. Installing Visual Studio

- Installing Visual Studio Community version.
- Setting the default language.
- Customizing the layout.
- Solution Explorer, Toolbox and the Properties windows.

2. Introduction to Programming

- Selecting a project template.
- Setting up user interaction and collecting inputs.
- Variable types - Double, Integer, and String.
- Acquiring user input from textboxes into variables.
- Calculations and display outputs.
- Using the .Net Math library functions.
- Various files and their meaning in the project structure.
- Separating source code from the executable.

3. Creating a Windows Forms Application

- Setting dialog box properties.
- Adding controls: Button, TextBox, Label, Checkbox, RadioButton.
- Adding images to PictureBox and other controls.
- Aligning text and images on controls.
- Composite controls: ListBox and ComboBox.
- Adjusting various properties for each type of control.

4. Arrays and Loops

- Filling arrays and reading array elements.
- Filling ListBoxes with array elements.
- ForEach loop.

5. Functions and Subroutines

- Arguments.
- Return Types.
- Return Values in Functions.
- Function Overloading.

6. Multi-Form Projects

- Adding Forms to a project.
- Form Constructor and object variables.
- Form objects and invoking Forms.
- Exchanging data between Forms.

Module 2: Revit API

7. Object Oriented Programming

- Creating a class.
- Adding member functions.
- Static and non-static methods.
- Public and Private methods.
- Adding member variables.
- Inheritance - Base & Derived class.
- Abstraction and Interfaces.
- Encapsulation.
- Polymorphism.

8. Advanced Topics for Revit API

- Enums and constants.
- Casting – traditional and modern methods.
- Class Attributes.
- Post-build events.
- Runtime update.
- LINQ – Language Integrated Query.

9. Creating a Plugin

- The Revit API.
- Viewing the Revit API.
- Setting up Visual Studio.
- Add classes and implement interface.
- The IExternalCommand.
- Creating a command.
- Task dialog.
- Task dialog builder.
- Invoking the application in Revit.

10. Plugin Usage

- Registering add-ins.
- Compiling the code.
- Creating a manifest file.

11. Selections in Revit

- Element Selection.
- Retrieving properties of selected elements.
- Selection Filter.
- Filters Basic.
- Get an element using filters.
- Filtering using LINQ techniques.
- Querying the FilteredElementCollector.
- Retrieve elements and element ids.

12. Working with Revit Elements

- Classifying elements.
- Retrieving element information.
- Filtered Element Collector.
- Creating a collector.

13. Transactions

- Start, commit and rollback transactions.
- Modifying elements.
- Creating families.
- Creating line-based elements.
- Creating loop elements.

14. Parameters

- Parameter Object Hierarchy
- Retrieve Parameter Value
- Set Parameter Value

15. Element Creation

- Creating walls.
- Single Wall Creation
- Multiple Wall Creation
- Element locations.
- Point locations and location curves.
- Editing methods.
- Single Transaction.
- Group Transactions.

16: Revit Family

- Load Family into Project.
- Activate a symbol.
- Place family into project.

17. Automating Drafting and Drawing

- Tagging elements.
- Creating automatic element tags.
- Creating sheets.

18. External applications

- Creating an IExternalApplication.
- Customizing the user interface.
- Adding ribbon tabs and ribbon panels.
- Adding buttons with icons.
- Invoking plugins from ribbon buttons.

19. Debugging Techniques

- Errors - syntax, logical and exceptions.
- Exception handling.
- Debugging techniques in Revit apps.
- Adding breakpoints and inspecting values.
- Determine source of error.
- Troubleshooting and fixing errors in the code.

Bonus Module: Dynamo

20. Dynamo

- What is Dynamo.
- What is Visual Programming.
- Getting Started with Dynamo.
- The Building Blocks of Dynamo.
- Code Vs. Nodes.
- Node Anatomy.
- Searching, browsing and adding nodes.
- Node wiring and data flow.
- Unwiring nodes.
- Grouping and ungrouping.
- Duplicating and renaming nodes.
- Input, output and previews.
- Watching node output.
- Code blocks.
- DesignScript language.
- Numerical inputs and Sliders.
- Graph view and background view.
- Zoom, Pan and rotate graphs.

21. Using Dynamo in Revit

- Creating geometry - point, lines.
- Creating Revit geometry.
- Lists and Ranges.
- Visualizing parameter data.
- Create, Action, Query nodes.
- Filter list by element type.
- Automating repetitive tasks.
- Creating custom nodes.
- Using the Dynamo player in Revit.

Other eBooks and Training Programs from CADVertex:

- ❖ CATIA Automation: VB.Net or CSharp or Python
- ❖ SolidWorks Automation: VB.Net or CSharp or Python
- ❖ Solid Edge Automation: VB.Net or CSharp or Python
- ❖ Inventor Automation: VB.Net or CSharp or Python

- ❖ NX Open: VB.Net or CSharp with Win Forms
- ❖ NX Open: VB.Net or CSharp with Block UI Styler
- ❖ Knowledge Fusion
- ❖ Knowledge Fusion with Block UI Styler

- ❖ Revit Automation using CSharp.Net + **Dynamo**
- ❖ Tekla Automation using CSharp.Net

- ❖ cMayoCAD: Learn to build a new CAD program from scratch using a Geometric Modeling Kernel and CSharp

- ❖ CATIA Automation with Python and Machine Learning
- ❖ Solid Edge Automation with Python + Machine Learning
- ❖ SolidWorks Automation with Python + Machine Learning
- ❖ Inventor Automation with Python + Machine Learning

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