Autodesk Professional in Revit for Structural Design

Target Audience

This course is tailored for structural engineers, architects, BIM modelers, and construction professionals who use Revit for structural design and analysis. It is ideal for those preparing for the Autodesk Certified Professional in Revit for Structural Design exam and seeking to enhance their expertise in structural modeling, documentation, and collaboration using Revit.

Course Objective

This course is designed to equip participants with advanced skills in Autodesk Revit for structural design. Learners will gain the ability to create detailed structural models, analyze structural systems, and efficiently manage project documentation within a BIM environment. The course content is aligned with the requirements of the **Autodesk Certified Professional in Revit for Structural Design** certification, preparing participants to demonstrate their expertise and successfully achieve industry-recognized certification.

Course Outcome

- Proficiency in Structural Modeling: Learn to create and modify detailed structural models, including beams, columns, slabs, foundations, and trusses, using Revit's advanced tools.
- Analytical Modeling and Collaboration: Gain expertise in creating analytical models, integrating them with analysis software, and collaborating with multidisciplinary teams using BIM workflows.
- Documentation and Detailing: Master the creation of construction documents, including structural drawings, schedules, and annotations, ensuring compliance with industry standards.
- Certification Readiness: Develop the knowledge and confidence required to pass the Autodesk Certified Professional in Revit for Structural Design exam, validating your skills and expertise.

Course Outline: The course comprises **56-hours** of theory and labs and is divided into **11** different chapters. Each chapter will be followed by hands-on lab exercises to reinforce learning and gauge understanding of the topics covered.

Chapter 1. Introduction to Autodesk Revit for Structure

Introduction to Autodesk Revit for Structure
Autodesk Revit as a Building Information Modeler
Basic Concepts and Principles

- Understanding the Parametric Building Modeling Technology
- Terms Used in Autodesk Revit for Structure
- Creating a Structural Model Using Parametric Building Elements
- Visibility/Graphics Overrides, Scale, and Detail Level
- Extracting Project Information
- Creating a Structural Drawing Set
- Creating an Unusual Building Geometry
- Flexibility of Creating Special Elements
- Creating Structural Layouts
- Working on Large Projects
- Working in Large Teams and Coordinating with Consultants

Starting Autodesk Revit
User Interface

- Title Bar
- Ribbon
- Application Frame
- Status Bar
- View Control Bar
- Options Bar
- Type Selector
- Drawing Area

Project Browser

- Keyboard Accelerators
- Properties Palette

Dialog Boxes
Multiple Document Environment
Interoperability of Autodesk Revit
Building Information Modeling and Autodesk Revit
Worksharing Using Revit Server

Autodesk Construction Cloud
Linking Analytical Model for Analysis
Autodesk Revit Help
- Using the Revit Help

Chapter 2. Getting Started with a Structural Project

Introduction
Starting a New Structural Project
Setting Project Units
- Common Unit Type
- Structural Unit Type

Structural Settings 2-9
- Symbolic Representation Settings Tab

Connection Settings
Snaps Tool
- Dimension Snaps Area
- Object Snaps Area
- Temporary Overrides Area

Options Dialog Box
- General Tab
- User Interface Tab
- Graphics Tab
- Hardware Tab
- File Locations Tab
- Rendering Tab
- Check Spelling Tab
- SteeringWheels Tab
- ViewCube Tab
- Macros Tab
- Cloud Model

Saving a Project
- Using the Save As Tool
- Using the Save Tool

Closing a Structural Project
Exiting a Structural Project
Opening an Existing Structural Project
- Opening an Existing Project Using the Open Tool
- Using the Windows Explorer to Open an Existing Project

Chapter 3. Setting up a Structural Project

Project Template
- Creating a Custom Project Template
- Settings for the Project Template
- Setting the Project Location

Using Levels
- Understanding Controls in a Level
- Adding Levels
- Instance and Type Properties of a Level
- Changing the Level Parameters
- Controlling the Visibility of Levels

Grids
- Creating Grids
- Creating Multi-Segmented Grids
- Modifying Grids
- Customizing the Grid Display
- Controlling the Visibility of Grids

Working with Reference Planes

Working with Work Planes
- Setting a Work Plane
- Controlling the Visibility of Work Planes
- Using the Workplane Viewer Window

Working with Project Views
- Viewing a Building Model
- Controlling the Visibility of Elements in Views

Scope Box
- Creating a Scope Box
- Applying a Scope Box to Datum Elements
- Controlling the Visibility of a Scope Box

Chapter 4. Structural Columns and Walls

Structural Columns
- Types of Structural Column
- Loading Structural Column Families
- Adding Structural Columns to a Project
- Creating Openings in Structural Columns
- Modifying the Element Properties of Structural Columns

Architectural Columns

- Adding Structural Column to an Architectural Column

Difference between a Structural Column and an Architectural Column
Structural Walls

- Adding Structural Walls
- Modifying Structural Walls

Chapter 5. Foundations, Beams, Floors, and Open Web Joists

Foundations

- Foundation Wall
- Shallow Foundations

Structural Floors

- Adding Structural Floors
- Modifying Structural Floors
- Adding Openings to a Structural Floor

Adding a Slab Edge to a Structural Floor
Beams

- Adding Beams
- Modifying Beams
- Adding a Structural Beam System

Open Web Steel Joists

- Adding K Series Joist System

Chapter 6. Editing Tools

Selecting Elements

- Selecting a Single Element
- Selecting Multiple Elements
- Selecting Elements Using the Advanced Selection Tools
- Restoring a Selection
- Selecting Elements Using the Filter Tool
- The Filter Icon

Moving Structural Elements

- Moving Elements by Changing Temporary Dimensions
- Moving Elements By Dragging
- Dragging End-joined Components
- Moving Elements Using the Move Tool

Copying Structural Elements

- Copying Elements Using the CTRL Key

- Copying Elements Using the Copy Tool
- Using the Create Similar Tool
- Copying Elements Using the Clipboard

Rotating Structural Elements
Mirroring Structural Elements

- Mirror - Pick Axis Tool
- Mirror - Draw Axis Tool

Arraying Structural Elements

- Linear Tool
- Radial Tool

Resizing Elements
Pinning Elements
Aligning Elements
Steel Element Cutting Tools

- Corner Cut
- Cope Skew
- Shorten
- Contour Cut

Structural Steel Connections

- Cope
- Miter
- Saw Cut - Flange
- Saw Cut - Web
- Cut Through
- Cut By

Matching Type Properties
Trimming and Extending Elements

- Trim/Extend to Corner Tool
- Trim/Extend Single Element Tool
- Trim/Extend Multiple Elements Tool

Offsetting Elements
Deleting Elements
Grouping Elements

- Creating Groups by Selecting Elements
- Creating Groups Using the Group Editor
- Creating a Detail Group
- Placing Groups
- Modifying Groups
- Excluding Elements from a Group

- Saving and Loading Groups

Editing Elements

- Applying and Removing Coping
- Joining and Unjoining Elements

Splitting a Face

Chapter 7. Documenting Models and Creating Families

Dimensioning

- Types of Dimensions
- Using Temporary Dimensions
- Entities in a Dimension
- Adding Permanent Dimensions
- Modifying Dimension Parameters
- Locking Permanent Dimensions
- Converting Temporary Dimensions into Permanent Dimensions

Text Notes

- Adding Text Notes
- Editing Text Notes

Adding Tags

- Tagging Elements by Category
- Tagging all Elements in a View
- Beam Annotations

Creating Families

- Creating In-Place Families
- Creating a Family Geometry in the Family Editor
- Editing a Family Geometry in the Family Editor
- Creating Cuts in a Family Geometry by Using the Family Editor

Chapter 8. Standard Views, Details, and Schedules

Elevation Views

- Creating a Building Elevation View
- Creating a Framing Elevation View

Section Views

- Creating a Section View

Callout Views

- Creating a Callout using the Rectangle Tool
- Creating a Callout Using the Sketch Tool
- Displaying a Callout View

- Modifying the Properties of a Callout View
- Creating Details in a Callout View

Drafting Details
- Creating a Drafting View
- Drafting a Detail

Duplicate Views
- Creating a Duplicate View as a Dependent View

Graphical Column Schedules
- Creating Graphical Column Schedule

Using Schedules in a Project
- Generating a Schedule
- Editing a Schedule

Generating the Material Takeoff Schedule

Chapter 9. 3D Views, Sheets, Analysis, and Reinforcements

Three-Dimensional (3D) Views
- Creating Orthographic 3D Views
- Creating Perspective Views
- Creating 3D Section Views

Generating Shadows
- Solar Study

Sheets
- Adding a Drawing Sheet to a Project
- Adding Views to a Drawing Sheet
- Modifying a Building Model in Sheets
- Adding Schedules to a Drawing Sheet

Structural Analytical Models
- Applying Analytical Automation
- Adding Analytical Members and Panels
- Adding Analytical Link
- Parameters for Analytical Member
- Applying Loads in Analytical Model
- Setting Boundary Conditions

Adding Reinforcements
- Place Rebar Parallel to the Work Plane Tool
- Place Rebar Perpendicular to the Cover Tool
- Cover Tool
- Area Tool

- Path Tool
- Free Form Rebar Tool
- Fabric Area Tool
- Fabric Sheet Tool
- Rebar Coupler Tool
- Bending Detail Tool

Linking Building Models and Sharing Coordinates

- Linking or Importing Models

Introduction to Massing
Understanding Massing Concepts
Creating the Massing Geometry

Chapter 10. Linking Revit Model with Robot Structural Analysis

Installing Robot Structural Analysis Professional
Structural Analysis Interoperability

- Linking the Analytical Model for Analysis and Code Check

Structural Analysis in Autodesk Robot Structural Analysis Professional

- Linking Revit Files to Robot
- Setting Job Preferences in Robot
- Analysis in Robot
- Viewing Results in Robot
- Updating the Model in Revit

Chapter 11. Advanced Practice: Design Development and Construction Documentation

Practice 1a: Open and Review a Project
Practice 2a: Start a Project and Link Files
Practice 2b: Set Up Levels
Practice 2c: Add Grids
Practice 3a: Duplicate Views and Set the View Display
Practice 3b: Add Callout Views
Practice 4a: Load Families
Practice 5a: Sketch and Edit Elements
Practice 5b: Work with Basic Modify Tools
Practice 5c: Work with Additional Modify Tools
Practice 6a: Place Structural Columns

Practice 6b: Copy and Monitor Elements
Practice 6c: Coordinate Linked Models
Practice 7a: Model Walls and Wall Footings
Practice 7b: Add Isolated Footings
Practice 8a: Model Structural Framing
Practice 8b: Modify Structural Framing
Practice 8c: Add Trusses
Practice 9a: Model Structural Slabs
Practice 9b: Create Shaft Openings
Practice 10a: Add Rebar
Practice 10b: Reinforce Structural Elements
Practice 11a: Set Up Sheets
Practice 12a: Work with Dimensions
Practice 12b: Work with Text
Practice 12c: Create Legends
Practice 13a: Add Tags and Symbols
Practice 13b: Work with Schedules
Practice 13c: Create a Graphical Column Schedule
Practice 14a: Create a Detail Based on a Section Callout
Practice 14b: Create a Bracing Detail
Practice 14c: Create Additional Details
Practice C1: Start a Structural Project
Practice C2: Create Foundation Elements
Practice C3: Frame a Concrete Structure