

Autodesk Revit – Robot Structural Analysis **Interoperability**

1. TARGET AUDIENCE

This comprehensive training is intended for structural engineers, BIM engineers, structural designers, BIM coordinators, consultants, and construction professionals who want to master the interoperability workflow between Autodesk Revit and Autodesk Robot Structural Analysis Professional. The course provides both foundational knowledge and practical skills required to develop intelligent structural BIM models, perform structural analysis, exchange analytical data efficiently, and generate accurate structural documentation while following industry-standard BIM workflows.

2. COURSE OBJECTIVE

Prepare participants for real-world structural engineering workflows by developing expertise in Autodesk Revit and Autodesk Robot Structural Analysis Professional. This course covers structural BIM modelling, analytical model preparation, structural load definition, finite element analysis fundamentals, interoperability workflows, synchronization techniques, structural design validation, documentation, scheduling, and quantity extraction. Through guided lessons, practical datasets, and project-based exercises, participants will gain the confidence to integrate BIM modelling with structural analysis for efficient project delivery.

3. COURSE OUTCOME

Upon successful completion of this course, participants will be able to:

- Create and organize structural BIM models using Autodesk Revit.
- Develop analytical models suitable for structural analysis.
- Export structural models seamlessly from Revit to Robot Structural Analysis.
- Define material properties, structural sections, load cases, and load combinations.
- Perform structural analysis using Robot Structural Analysis Professional.
- Synchronize analytical changes between Revit and Robot while maintaining model integrity.
- Validate structural behaviour using analysis results.
- Generate structural documentation, schedules, and Bills of Quantities (BOQ).
- Apply industry best practices for BIM-enabled structural design workflows.

4. COURSE OUTLINE

The course comprises **32 hours** of instructor-led theory and hands-on laboratory sessions and is divided into **8 different chapters**. Each chapter is followed by practical exercises using real-world structural projects to reinforce learning and evaluate understanding of the concepts covered.



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Chapter 1. Introduction & Setup

- Course Overview and Objectives
- Introduction to BIM and Structural Analysis Workflow
- Overview of Autodesk Revit & Robot Structural Analysis
- User Interface and Project Environment
- Course Resources and Best Practices

Chapter 2. Revit Fundamentals Refresher

- Structural Project Setup and Templates
- Levels, Grids, and Reference Elements
- Structural Families and Parameters
- Structural Columns, Beams, Floors, Walls, and Foundations
- View Management and Model Organization
- Analytical Model Basics
- Best Practices for Structural BIM Modeling

Chapter 3. Structural Modeling in Revit

- Creating Structural Framing Systems
- Modeling Foundations and Structural Elements
- Structural Connections and Load Paths
- Analytical Model Preparation
- Model Validation and Integrity Checks
- Coordination Best Practices
- Hands-on Structural Modeling Exercise

Chapter 4. Robot Structural Analysis Fundamentals

- Introduction to Robot Structural Analysis Interface
- Material Properties and Section Databases
- Structural Members and Boundary Conditions
- Load Cases and Load Combinations
- Structural Analysis Workflow
- Reviewing Analysis Results
- Design Verification Fundamentals

Chapter 5. Revit–Robot Interoperability

- Preparing Revit Models for Structural Analysis
- Exporting and Importing Analytical Models
- Synchronization and Round-Trip Workflow
- Managing Data Exchange and Model Updates
- Resolving Interoperability Issues
- Steel Frame Building Case Study



- BIM Collaboration Best Practices

Chapter 6. Advanced Structural Analysis

- Linear and Non-Linear Structural Analysis
- Wind and Seismic Load Applications
- Structural Performance Evaluation
- Design Code Verification and Compliance
- Member Optimization and Design Validation
- Interpretation of Structural Analysis Results

Chapter 7. Structural Documentation in Revit

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- Structural Plans, Sections, and Detail Views
- Annotation, Dimensions, Tags, and Symbols
- Documentation Standards and Best Practices
- Publishing and Exporting Project Deliverables

Chapter 8. Schedules, BOQ & Project Deliverables

- Structural Schedules and Material Take-Offs
- Bills of Quantities (BOQ)
- Quantity Verification and Reporting
- Project Documentation Review
- Final Model Validation
- Course Summary and Project Deliverables

