

OpenBridge Modeler – Bridge Modeling, Coordination and Documentation

Target Audience

This course is designed for bridge engineers, highway engineers, civil engineers, BIM professionals, transportation consultants, CAD technicians, infrastructure designers, and project coordinators involved in bridge planning, design, modeling, and documentation. It is also suitable for professionals seeking to adopt model-based bridge delivery workflows and improve collaboration across multidisciplinary infrastructure projects.

Course Objectives

This training aims to provide participants with the knowledge and practical skills required to create intelligent bridge models using OpenBridge Modeler. Participants will learn to model bridge superstructures and substructures, apply parametric and rule-based design techniques, perform model validation and clash detection, generate project documentation, and integrate bridge models with roadway, geotechnical, and construction planning workflows. The course also introduces collaborative BIM processes and digital delivery practices used in modern bridge engineering projects.

Course Outcomes

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

- Create intelligent 3D bridge models using OpenBridge Modeler.
- Develop bridge superstructures including concrete, steel, prestressed, and segmental bridge systems.
- Model bridge substructures including abutments, piers, foundations, bearings, and wing walls.
- Apply parametric and constraint-driven bridge design methodologies.
- Perform bridge model validation, clash detection, and constructability reviews.
- Generate plans, elevations, sections, and construction documentation.
- Produce material quantity take-offs and cost estimation reports.
- Integrate bridge models with OpenRoads, OpenGround, ProjectWise, and Bentley Infrastructure Cloud.
- Create visualization models and construction sequencing simulations using LumenRT and SYNCHRO.
- Deliver complete bridge BIM models aligned with modern digital engineering and infrastructure delivery practices.

Course Outline

The course comprises **40 hours of theory and hands-on laboratory sessions** and is divided into **10 comprehensive modules**. Each module is followed by practical exercises and real-world site development workflows designed to reinforce learning and evaluate the participant's understanding of the concepts covered.

Table of Contents

Module 1: Introduction to OpenBridge Modeler and Bridge BIM Workflows

- Overview of OpenBridge Modeler
- Bridge Information Modeling (BrIM) Concepts
- User Interface and Project Environment
- Project Setup and Standards
- 2D and 3D Bridge Design Workflows

Module 2: Bridge Geometry and Alignment Fundamentals

- Bridge Layout Fundamentals
- Horizontal and Vertical Alignments
- Reference Roadway Information
- Cross-Section Templates
- Rule-Based and Constraint-Driven Modeling

Module 3: Superstructure Modeling

- Bridge Superstructure Components
- Concrete Slab Bridges
- T-Beam Bridges
- Precast Prestressed Girder Bridges
- Steel I-Girder Bridges
- Steel Box (Tub) Girder Bridges

Module 4: Advanced Bridge Superstructure Design

- Segmental Bridge Modeling
- Span-by-Span Bridge Modeling
- Balanced Cantilever Bridges

- Cross Frames and Diaphragms
- Stiffeners and Steel Detailing Features
- Complex Bridge Geometry Management

Module 5: Substructure Modeling

- Abutment Design and Modeling
- Pier Modeling
- Columns, Caps, and Footings
- Pile Foundations
- Wing Walls
- Bearings and Beam Seats

Module 6: Bridge Components and Parametric Modeling

- Deck Slabs and Approach Slabs
- Crash Barriers and Medians
- Light Poles and Appurtenances
- Ground Excavation Modeling
- Custom Components Creation
- Intelligent Parametric Bridge Components

Module 7: Bridge Coordination and Model Validation

- Multidiscipline Coordination
- Clash Detection and Clearance Analysis
- Constructability Review
- Dynamic View Generation
- Design Verification Techniques
- Model Quality Control

Module 8: Integration and Collaborative Workflows

- OpenRoads Integration
- ProjectWise Collaboration
- OpenGround Integration
- Bentley Infrastructure Cloud Workflows
- iTwin and iModel Concepts

Module 9: Drawing Production and Quantity Reporting

- Plan Generation
- Elevation Drawings
- Section Drawings
- Annotation and Documentation
- Material Quantity Reports
- Cost Estimation and Reporting

Module 10: Visualization, Construction Planning

- 3D Visualization Techniques
- LumenRT Integration
- Construction Sequencing