



# **Bentley OpenPlant Modeler: Modeling, Documentation & Clash Detection**

## **Course Objectives**

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

- Understand the fundamentals of plant design and the OpenPlant Modeler environment for creating intelligent 3D plant models.
- Develop equipment, piping, cable tray, and HVAC systems using industry-standard workflows and specifications.
- Utilize OpenPlant Model Server for collaborative, data-centric project management and multi-user design coordination.
- Generate engineering deliverables such as isometric drawings, orthographic views, and project documentation directly from the 3D model.
- Perform model review, clash detection, and design validation to improve project quality and reduce construction conflicts.

## **Course Outcomes**

After successfully completing this course, participants will be able to:

- Create and manage complete intelligent plant models using OpenPlant Modeler.
- Model equipment, nozzles, piping systems, cable trays, and HVAC networks efficiently and accurately.
- Apply industry best practices for plant design, routing, component placement, and project documentation.
- Generate and manage engineering deliverables, including isometric drawings, model snapshots, and drawing sheets.
- Conduct clash detection, resolve design conflicts, and participate effectively in multidisciplinary plant design projects.
- Collaborate with project teams using OpenPlant Model Server and data-centric workflows.

## **Target Audience**

This course is designed for:

- Plant Design Engineers and Plant Layout Engineers involved in industrial facility design projects.
- Piping Engineers, Piping Designers, and Drafting Professionals seeking expertise in 3D plant modeling.



- Mechanical Engineers working in oil & gas, petrochemical, power, water treatment, and process industries.
- CAD/BIM Professionals looking to transition into intelligent plant design and digital engineering workflows.
- Engineering Consultants, EPC professionals, and project team members responsible for plant design coordination and documentation.
- Students and fresh graduates aspiring to build a career in industrial plant engineering and 3D plant modeling.

## **Course Outline**

The course comprises **48**-hours of theory and labs and is divided into **13** different Modules. Each chapter will be followed by hands-on lab exercises to reinforce learning and gauge understanding of the topics covered.

### **Table of Contents: -**

#### **Module 1: Introduction to OpenPlant Modeler**

- 1.1 Overview of OpenPlant Modeler
- 1.2 Plant Design Workflow and Applications
- 1.3 OpenPlant Modeler Interface Overview
- 1.4 Project Setup and Configuration
- 1.5 Understanding Workspaces and Standards
- 1.6 Creating Units, Systems, and Pipelines
- 1.7 Best Practices for Plant Modeling

#### **Module 2: Equipment Modeling Fundamentals**

- 2.1 Introduction to Equipment Modeling
- 2.2 Equipment Libraries and Specifications
- 2.3 Creating Parametric Equipment
- 2.4 Modifying Equipment Parameters
- 2.5 Placement and Positioning Techniques
- 2.6 Equipment Connectivity Concepts
- 2.7 Equipment Modeling Best Practices

#### **Module 3: Advanced Equipment Creation**

- 3.1 Building Custom Equipment
- 3.2 Creating User-Defined Components
- 3.3 Managing Equipment Templates
- 3.4 Equipment Data and Properties
- 3.5 Reusing and Updating Equipment Models
- 3.6 Equipment Validation Techniques



## **Module 4: Nozzle Management**

- 4.1 Introduction to Nozzle Manager
- 4.2 Nozzle Manager Interface and Toolbar
- 4.3 Creating and Editing Nozzles
- 4.4 Nozzle Placement Standards
- 4.5 Connecting Equipment and Piping
- 4.6 Managing Nozzle Specifications
- 4.7 Copying and Modifying Equipment Settings

## **Module 5: OpenPlant Model Server**

- 5.1 Introduction to OpenPlant Model Server
- 5.2 Data-Centric Plant Design Concepts
- 5.3 Model Server Architecture
- 5.4 Item Browser Overview
- 5.5 Component Check-Out and Check-In Process
- 5.6 Managing Design Revisions
- 5.7 Model Server Task Menu
- 5.8 Collaboration and Multi-User Workflows

## **Module 6: OpenPlant Piping Fundamentals**

- 6.1 Introduction to Piping Design
- 6.2 Piping Specifications and Standards
- 6.3 Basic Modeling Guidelines
- 6.4 Routing Pipes in OpenPlant
- 6.5 Piping Task Menu Overview
- 6.6 Tool Palettes and Preferences
- 6.7 Standard Piping Components
- 6.8 Pipe Connectivity and Validation

## **Module 7: Advanced Piping Modeling**

- 7.1 Pipe Routing Techniques
- 7.2 Valves, Fittings, and Specialty Components
- 7.3 Branch Connections and Pipe Modifications
- 7.4 Working with Key-ins and Commands
- 7.5 Clash-Free Piping Strategies
- 7.6 Piping Modeling Exercises
- 7.7 Plant Layout Development

## **Module 8: Isometric Generation and Documentation**

- 8.1 Introduction to Isometric Drawings
- 8.2 Auto-Generating Isosheets
- 8.3 Isometric Extraction Settings
- 8.4 Annotation and Dimensioning



8.5 Isometric Review and Validation

8.6 Deliverables and Documentation Standards

**Module 9: OpenPlant Cable Tray Modeling**

9.1 Introduction to Cable Tray Systems

9.2 Cable Tray Design Standards

9.3 Creating Traylines

9.4 Cable Tray Routing Techniques

9.5 Tray Components and Accessories

9.6 Cable Tray Documentation

**Module 10: OpenPlant HVAC Modeling**

10.1 Introduction to HVAC Systems

10.2 HVAC Components and Specifications

10.3 Creating HVAC Systems

10.4 Duct Routing and Modifications

10.5 HVAC Connectivity and Coordination

10.6 HVAC Modeling Best Practices

**Module 11: Drawing Management and Deliverables**

11.1 Introduction to Drawing Management

11.2 Creating Model Snapshots

11.3 Defining Views in 3D Models

11.4 Generating Orthographic Drawings

11.5 Drawing Annotation and Documentation

11.6 Managing Revisions and Updates

11.7 Publishing Project Deliverables

**Module 12: Model Review and Clash Detection**

12.1 Introduction to OpenPlant Model Review

12.2 Review Workflows and Navigation

12.3 Clash Detection Fundamentals

12.4 Clash Detection Interface Overview

12.5 Running Clash Detection Tests

12.6 Reviewing and Resolving Clashes

12.7 Clash Reports and Coordination Workflows

12.8 Project Quality Assurance and Best Practices

**Module 13: Integrated Plant Design Project**

13.1 Project Setup and Requirements

13.2 Equipment Modeling Exercise

13.3 Piping System Development

13.4 Cable Tray and HVAC Integration

13.5 Drawing Extraction and Documentation



13.6 Clash Detection and Resolution

13.7 Final Model Review

13.8 Project Submission and Evaluation