

# Autodesk Advance Steel

## Target Audience

This course is designed for structural engineers, steel detailers, fabricators, and BIM professionals who want to enhance their expertise in steel design, detailing, and fabrication using Autodesk Advance Steel. It is suitable for professionals in the construction, infrastructure, and manufacturing industries, as well as students and engineers looking to improve their skills in 3D modeling and automated steel detailing.

## Course Objective

The course aims to provide in-depth knowledge of Autodesk Advance Steel, enabling participants to efficiently create 3D steel models, generate automated fabrication drawings, and produce accurate BOMs (Bill of Materials). By the end of this course, learners will be able to streamline their steel detailing workflows, reduce errors, and enhance collaboration in structural projects.

## Course Outcome

- **3D Steel Modeling Proficiency** – Gain expertise in creating precise steel structures, connections, and components using intelligent parametric tools in Advance Steel.
- **Automated Drawing & Documentation** – Learn to generate fabrication drawings, shop drawings, and erection drawings with automatic dimensions, annotations, and material lists.
- **Connection Design & Customization** – Understand the application of standard and custom steel connections, including bolts, welds, and plates, ensuring compliance with industry standards.
- **Collaboration & BIM Integration** – Explore how to integrate Advance Steel with Autodesk Revit, AutoCAD, and other BIM tools for seamless collaboration and project management.

**Course Outline:** The course comprises **40-hours** of theory and labs and is divided into **14** 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 Advance Steel

- Autodesk Advance Steel
- Autodesk Advance Steel Workflow
- Autodesk Advance Steel Interface
- Other Autodesk Advance Steel Palettes
- Understanding the Folder Structure
- The User Coordinate System (UCS)
- Changing Viewpoints and Visual Styles
- Navigating through the Model
- Invoking the Advance Steel Tools
- Home Ribbon Tab vs Other Ribbon Tabs
- Locating Points in the Drawing Window
- Selecting Objects
- Grip Editing
- Use of Layers in Advance Steel
- Creating and Editing Auxiliary Objects
  - Creating and Editing Grids
- Inserting Concrete Objects
  - Inserting Concrete Beam
  - Inserting Concrete Column
  - Inserting Isolated Footing
  - Inserting Continuous Footing
  - Inserting Wall
  - Inserting Polygonal Wall
  - Inserting Curved Concrete Beam
  - Inserting Rectangular Slab
  - Inserting Polygonal Slab
- Editing Concrete Sections

## Chapter 2. Inserting and Editing Structural Sections

- Inserting Straight Structural Sections
  - Inserting Rolled I-sections
  - Inserting Channel Sections
  - Inserting Angle Sections

- Inserting T Sections
- Inserting Circular Hollow Sections (CHS)
- Inserting Z-Steel Sections
- Inserting Flat Sections
- Inserting Round Bar Sections
- Inserting Square/Rectangular Hollow Sections (RHS/SHS)
- Inserting Cold Rolled Sections
- Inserting Other Sections

Inserting Curved Structural Sections

Inserting Structural Sections on Lines, Arcs, or Polylines

- Inserting Structural Sections on Lines or Arcs
- Inserting Structural Sections on Polylines

Inserting Columns

Inserting Continuous Structural Sections

Editing Inserted Structural Sections

Splitting and Merging Structural Sections

- Splitting Structural Sections
- Merging Structural Sections
- Matching Properties of Sections

Working with Levels

- Creating Levels

## Chapter 3. Advanced Structural Elements -I

Advanced Structural Elements

Inserting Portal/Gable Frames

Inserting Mono-Pitch Frames

Editing Portal/Gable/Mono-Pitch Frames

Inserting Purlins

Inserting Trusses

## Chapter 4. Inserting the Plates at Beam and Column - Beam Joints

The Connection Vault Palette

Inserting the Plates at Beam Joints

- Base plate Joint
- Tube base plate Joint
- Corner base plate Joint
- Base plate cut Joint

Inserting the Column-Beam Joints

- Knee of frame bolted, with haunch Joint

- Knee of frame at web, with haunch Joint
- Gable wall end plate Joint

Adding Joints to the Favourites Category

Editing Joints

Propagating Joints

Copying Joints with Master-Slave Relationship

Upgrading Joint to the Primary Joint

Adding or Removing Joints from the Joint Group

## **Chapter 5. Inserting the Beam End to End, Platform Beam, and Purlin Joints**

Inserting the Beam End to End Joints

- Apex haunch Joint
- Double apex haunch Joint
- Front plate splice Joint

Inserting the Platform Beams Joints

- Clip angle Joint
- Clip angle - Skewed Joint
- Double side clip angle Joint
- Single side end plate Joint
- Double side end plate with safety bolt Joint
- Shear plate Joint

Inserting the Purlins and Cold Rolled Joints

- Purlin connection Joint
- Purlin connection with plate Joint
- Single purlin plate Joint
- Double purlin splice plate Joint
- Single Eaves Beam Bracket from Plate with End Plate Joint
- Double Eaves Beam Bracket from Plate with End Plate Joint

## **Chapter 6. Advanced Structural Elements – II**

Advanced Structural Elements

Inserting Bracings

Inserting Joists

Inserting Straight Stairs

Inserting Hand-Railings

Inserting Monowills

Inserting Penalized Monowills

## Chapter 7. Inserting the Bracing, Tube, and Stair Joints

### Inserting the General Bracing Joints

- Gusset plate to column and base plate Joint
- Gusset plate at one diagonal Joint
- Gusset plate for 2 diagonals Joint
- Four diagonals - Middle gusset plate Joint

### Inserting Tube Joints

- Tube connection with sandwich plate - additional objects Joint
- Tube connection with sandwich plates Joint
- Tube connection with sandwich plates - 2 diagonals Joint

### Inserting Miscellaneous Joints

- Stair Anchor Base Plate Joint
- Stair Anchor Angle Joint
- Railing joint handrail Joint

## Chapter 8. Inserting Plates and Gratings, and Controlling the Object Visibility

### Use of Plates in Advance Steel

#### Creating Flat Plates

- Creating a Rectangular Plate by Specifying its Center Point
- Creating a Rectangular Plate by Specifying Two Corner Points
- Creating a Rectangular Plate by Specifying Three Corner Points
- Creating a Polygonal Plate
- Creating a Plate using a Polyline
- Creating a Polyline using a Plate

#### Creating Folded Plates

- Creating a Folded Plate Without Position Adjustment
- Creating a Folded Plate With Position Adjustment
- Creating a Conical Folded Plate
- Creating a Twisted Folded Plate
- Creating a Circular Plate at the Origin
- Checking the Plate Unfolding
- Setting the Folded Plate Main Object

#### Editing Flat and Folded Plates

- Splitting a Plate Using Two Points
- Splitting a Plate Using a Line

- Merging Plates
- Shrinking and Expanding Poly Plates

#### Inserting Gratings

- Inserting a Standard Grating
- Inserting a Rectangular Variable Grating
- Inserting a Bar Grating
- Inserting a Polygonal Variable Grating
- Inserting a Grating at a Polyline

#### Creating Plate and Grating Features

- Rectangular contour, center
- Rectangular contour, 2 points
- Circular contour, center
- Circular contour, 2 points
- Polygonal contour
- Element contour
- Inserting a Corner on a Poly Plate
- Removing a Corner from the Poly Plate

#### Controlling the Object Visibility

- Turning off the Visibility of the Selected Objects
- Turning on the Visibility of All the Objects
- Showing Only the Selected Objects
- Turning off the Visibility of the Selected Assemblies
- Showing Only the Selected Assemblies
- Cycling through the Display Type of the Objects
- Restoring the Standard Display Type of the Objects

## Chapter 9. Extended Modeling and Productivity Tools

#### Creating Cage Ladders

#### Creating Spiral Stairs

#### Inserting Wallrails

#### Selection Tools in the Advance Steel Tool Palette

- Display connected objects
- Clear marked objects
- Select all marked objects
- Display objects connected in shop
- Display connection means
- Remove marking + display connected objects
- Remove marking + display objects connected in shop
- Remove marking + display connection means

### Creating Beam Cut Features

- Creating Miter Cuts
- Cutting at an Object

### Manually Connecting Parts

- Inserting a Rectangular Bolt Pattern using Two Points
- Inserting a Rectangular Bolt Pattern using the Center Point
- Inserting a Rectangular Bolt Pattern using the Corner Point
- Inserting a Circular Bolt Pattern using the Center Point
- Splitting Bolt Groups
- Inserting a Weld Point
- Inserting a Line of Weld
- Adding Objects to an Existing Bolted or Welded Connection
- Removing Objects from an Existing Bolted or Welded Connection
- Switching the Connection Pattern Objects

## Chapter 10. Adding Custom Connections and Profiles

### Custom Connections

- Inserting Plates Along the Beam Flange
- Inserting Plates on the Beam Flange
- Inserting Plates Parallel to the Beam Flange
- Inserting Plates Along the Beam Web
- Inserting Plates on the Beam Web
- Inserting Plates Parallel to the Beam Web
- Inserting Bolts on Beams
- Inserting Bolts on Beam Gauge Line
- Inserting Studs on the Beams
- Inserting Galvanizing Holes
- Inserting a Plate on an Existing Plate
- Inserting a Plate Perpendicular to an Existing Plate
- Inserting a Plate at an Edge of the Existing Plate

### Creating Custom Connections

### Inserting Custom Connections

### Adding Custom Profiles to the Database

## Chapter 11. Working with Project Explorer and Model Browser

### The Project Explorer

- Creating Model Views
- Creating Levels

- Creating Queries
- Creating Groups

Creating Workplanes

The Model Browser

Creating Work Area

## Chapter 12. Model Validation and Numbering

Validating the Structure Model

- Checking Modeling Errors in the Structural Model
- Checking Clashes in the Structural Model
- Finding the Center of Gravity and Weight of the Structural Model

Configuring Prefixes for Numbering

Numbering the Structure Model

## Chapter 13. Generating Drawings using the Drawing Processes

Generating Drawings

Creating Cameras in the Model

- Creating Cameras on UCS
- Creating Cameras at the Node

The Drawing Processes

Locating of Detail Documents

The Document Manager

Customizing Prototypes (Templates)

Customizing Processes

## Chapter 14. Working with Drawing Styles, BOMs, DXF, and NC Files

The Drawing Styles

Generating Bill of Material (BOM)

Customizing BOM Templates

Generating Machining Files

- Generating NC Files for Beam Cutting
- Generating DXF Files for Plate Cutting
- Configuring NC and DXF Settings

Inserting Compass Symbol

Generating Callout Views