TOPENGINEER - COURSE PROGRAMME

Level 2 - Custom components in Tekla Structures

Two programme parts. Timing and practical work depend on the selected 2-, 5- or 10-day format.

Part 1 - Parametric connections

Custom component fundamentals

1.1 Understanding the purpose and capabilities of system components

1.2 Exploring the capabilities of custom components

1.3 Understanding the component workflow in Tekla Structures

1.4 Non-parametric and parametric custom components

1.5 Following the custom component creation workflow

1.6 Understanding custom component types and their insertion methods

Connections, bindings and stiffeners

1.7 Creating a non-parametric column base component

1.8 Creating a non-parametric beam-to-column-flange end plate connection

1.9 Creating a non-parametric beam-to-column-web end plate connection

1.10 Creating a non-parametric beam-to-beam end plate connection

1.11 Creating a non-parametric beam-to-beam fin plate connection

1.12 Creating a parametric beam-to-column-flange connection

1.13 Understanding parametric connections: binding points to planes

1.14 Understanding every field in the Variables dialog

1.15 Binding a point to the top of a beam and defining its behaviour

1.16 Binding a point to the bottom of a beam and defining its behaviour

1.17 Binding points to the left and right sides of a beam

1.18 Creating and parameterising column stiffeners

Variables and connection properties

1.19 Adding a Yes/No variable to control whether an object is created

1.20 Adding a variable for object class and colour

1.21 Adding a variable for material grade

1.22 Adding a variable for chamfer type

1.23 Adding a variable for chamfer size

1.24 Adding a variable for profile selection

1.25 Adding a variable for bolt standard

1.26 Adding a variable for bolt diameter

1.27 Coordinating bolt standard and bolt diameter selection

1.28 Adding a variable for weld type

1.29 Adding a variable for weld size

1.30 Controlling bolt quantities through spacing lists

1.31 Retrieving the current dimensions of beam and column profiles

Formulas, bolt layouts and testing

1.32 Using the mid() string function

1.33 Using the find() string function

1.34 Using the length() string function

1.35 Using the round() function

1.36 Using the ceil() function

1.37 Using the int() conversion function

1.38 Saving, importing and exporting components between models

1.39 Automatically setting the vertical offset to the first bolt

1.40 Automatically setting horizontal bolt spacing

1.41 Adapting bolt layouts to the beam profile

1.42 Testing different profile sizes and correcting bolt layout errors

1.43 Checking that dependent variables update when the beam profile changes

1.44 Debugging parameter saving and custom component reuse

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Part 2 - Automation and component dialogs

Developing and testing reusable connections

2.1 Creating a non-parametric component ready for parameterisation

2.2 Reviewing the practical assignment

2.3 Building a test model with different beam and column combinations

2.4 Creating the connection for the first profile combination

2.5 Parameterising the first example for use with other profile combinations

2.6 Testing the connection across the full test model

2.7 Configuring several connections in the prepared test model

Lookup tables and data-driven components

2.8 Preparing tabular data for use by custom components

2.9 Understanding common errors when reading lookup tables

2.10 Understanding how components retrieve data from lookup tables

2.11 Practical exercise: using a real design table in a component

2.12 Turning a non-parametric component into a fully automated component

2.13 Defining priorities in the component’s parametric logic

2.14 Handling profile combinations that are not included in the lookup table

2.15 Using AI to populate lookup tables from PDF documents

2.16 Understanding the limitations of reading data from Excel

Ladders, stairs and nested components

2.17 Creating a handrail component

2.18 Creating a fixed steel access ladder component with a safety cage

2.19 Creating a stair flight component

2.20 Creating custom seams

2.21 Creating reference distances in a custom component

2.22 Creating a component that switches between sub-component types

Component dialogs and deployment

2.23 Understanding custom component dialog design

2.24 Adding a tab to a custom component dialog

2.25 Organising variables across dialog tabs

2.26 Arranging variable controls within each tab

2.27 Adding images to a custom component dialog

2.28 Updating images in a custom component dialog

2.29 Creating a drop-down list without images

2.30 Creating a picture drop-down list

2.31 Creating a beam-to-column-web connection component

2.32 Building a 3D test model from AutoCAD files

2.33 Applying the developed components to a real project model

2.34 Correcting component errors and resolving clashes

2.35 Understanding component export and import into a new model

2.36 Reusing Tekla’s built-in bolt dialog images and interface elements

2.37 Testing the component on actual bolted connections

AutoConnection and AI-assisted C# connections

2.38 Working with AutoConnection

2.39 Automating the placement of suitable connections in the 3D model

2.40 Developing bracing connections

2.41 Exploring the capabilities and advantages of C# connections with AI assistance

2.42 Creating a custom C# connection with AI assistance

2.43 Testing an AI-assisted C# connection with different profile combinations

2.44 Comparing a custom component with an AI-assisted C# connection