



Advanced SOLIDWORKS Course: Mechanical Design, Simulation and Product Development



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Introduction:

Advanced SOLIDWORKS for mechanical design, simulation and product development is a 1-week course for mechanical design, product development and manufacturing engineering staff in equipment, manufacturing and maintenance organisations, ending with a Validated Product Design Package. Many design teams build fragile models that break when dimensions change, release drawings without consistent tolerancing and find strength or fit problems only at the prototype stage. Nominees already model parts and assemblies in SOLIDWORKS daily, and teaching is by hands-on lab work on a product assembly. CoreConcept Training Center delivers this advanced SOLIDWORKS course.

Course Objectives:

- Build robust parametric parts with clear design intent, equations, global variables and multibody techniques
- Create product families with configurations and design tables that stay stable when dimensions change
- Design assemblies top-down with layout sketches and in-context references, and control their performance
- Model sheet metal parts, weldment frames and complex surfaces that can be manufactured
- Validate designs with SOLIDWORKS Simulation linear static studies and act on the results
- Release toleranced drawings to ASME Y14.5 or ISO 1101 and control revisions through SOLIDWORKS PDM

Target Audience:

- Mechanical design engineers responsible for part and assembly models
 - Product development engineers responsible for new product designs and variants
 - Manufacturing engineers responsible for design for manufacture and fabrication data
 - Design checkers responsible for drawings, tolerancing and release
 - CAD administrators responsible for templates, libraries and design data management
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Course Outline:

Day 1: Design Intent and Advanced Part Modelling

- Design Intent Planning for Parametric Feature Trees
- Equations and Global Variables for Driven Dimensions
- Multibody Part Techniques for Complex Components
- Feature Failure Diagnosis With FeatureXpert Tools
- Existing Model Robustness Review and Rebuild Test

Day 2: Configurations, Assemblies and Top-Down Design

- Design Tables for Configured Product Families
- Layout Sketches for Top-Down Assembly Design
- In-Context References and External Reference Control
- Assembly Mates, Patterns and Motion Checks
- Large Assembly Performance With Lightweight and SpeedPak

Day 3: Sheet Metal, Weldments and Surfaces

- Sheet Metal Parts With Bend Tables and Flat Patterns
- Weldment Frames With Structural Profiles and Cut Lists
- Surface Modelling for Ergonomic and Cast Shapes
- Mould Tools for Draft and Parting Line Checks
- Interference and Clearance Detection Across Assemblies

Day 4: Validation, Tolerancing and Data Control

- SOLIDWORKS Simulation Linear Static Study Setup
- Mesh Quality, Boundary Conditions and Result Interpretation
- ASME Y14.5 and ISO 1101 Tolerancing on Drawings
- DimXpert Model-Based Definition for Manufacturing Data
- SOLIDWORKS PDM Revision and Release Workflow Control

Day 5: Lab Work and the Validated Design Package

- Lab Exercise Building a Configured Product Assembly
 - Lab Exercise Validating a Load-Bearing Bracket Design
 - Lab Exercise Producing Toleranced Manufacturing Drawings
 - Design Review Against Manufacture and Assembly Checklist
 - Validated Product Design Package Completion and Release
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Skills You Will Gain:

- Parametric Design Intent
- Configuration Management
- Top-Down Assembly Design
- Sheet Metal and Weldment Design
- Surface Modelling
- Finite Element Validation
- Geometric Tolerancing
- Design Data Release

Why Attend This Course:

- Deliver a Validated Product Design Package with configured models, toleranced drawings and a simulation report to the engineering manager and production planning
- Decide when a design is robust, validated and toleranced enough to release for prototyping or manufacture
- Avoid prototype failures, broken models and manufacturing rework caused by weak design intent and unchecked tolerances
- Coach design colleagues on the modelling rules, simulation checks and release workflow practised in the lab

Conclusion:

Back at work, the participant gives the Validated Product Design Package to the engineering manager, production planning and the quality team. They use it to decide whether the design is ready for prototype or production release and which modelling and tolerancing rules the team adopts. After the first release, the organisation should compare engineering change requests, prototype issues and manufacturing queries with earlier products and update its templates, libraries and release checklist accordingly.

Frequently Asked Questions FAQ:

What should participants know before an advanced SOLIDWORKS course?

Participants should already model parts, assemblies and drawings in SOLIDWORKS as part of their daily work. Bringing a typical product model, drawing template or known design problem helps them apply the lab exercises to their own products.

How does an advanced SOLIDWORKS course differ from a SOLIDWORKS essentials course?

Essentials courses teach basic sketching, features, assemblies and drawings. This course assumes that skill and concentrates on design intent, configurations, top-down design, sheet metal, weldments, surfaces, simulation, tolerancing and release control for product development teams.

Why does design intent matter in advanced SOLIDWORKS product development?

Design intent decides how a model reacts when dimensions change. Models built with clear references, equations and configurations update reliably, which shortens change cycles and keeps drawings, simulations and manufacturing data consistent.

What do participants take back from the advanced SOLIDWORKS course?

Participants take back a Validated Product Design Package with configured models, a simulation report and toleranced drawings, plus modelling rules and a release checklist they can apply to their next product.