BLACKBIRD FOR TRAINING

# SolidWorks 3D CAD Modeling and Engineering Drawings Course

25 – 29 July 2027
Cairo (Egypt)

UK Traininig
PARTNER



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## Introduction:

This SolidWorks 3D CAD Modeling and Engineering Drawings Training Course equips you to create manufacturing-ready digital product designs and validated fabrication documentation across five practical days. You will build a Production-Ready SolidWorks 3D CAD Model and Engineering Drawing Package incorporating parametric features, multi-part assemblies, bill of materials tables, and tolerance annotations. You need a foundational understanding of basic engineering graphics and drafting principles, as this practitioner-level course develops hands-on software competencies from parametric sketching to digital definition. You will practise hands-on in intensive computer lab sessions, resolving geometric constraints, evaluating mechanical interferences, and detailing drafting layouts.

## Course Objectives:

- Build parametric 3D solid components using geometric sketch relations and advanced features in SolidWorks
- Map multi-component mechanical assemblies and automated bills of materials using relational mates in SolidWorks
- Draft standardised manufacturing drawing sheets complying with ISO 128 and ISO 129 presentation rules in SolidWorks
- Run geometric dimensioning and tolerancing verifications aligned with ASME Y14.5-2018 requirements using SolidWorks DimXpert
- Test model-based definition packages against ASME Y14.41-2019 digital product guidelines in hands-on lab projects

## Target Audience:

- You model mechanical components and equipment enclosures using computer-aided parametric design software
- You draft fabrication, assembly, and machining drawings for manufacturing and workshop production teams
- You verify drawing packages, part tolerances, and bills of materials against technical drafting standards
- You configure digital 3D models and layout assemblies for mechanical and industrial engineering projects



## Course Outline:

### Day 1: Establishing Parametric Sketches and Solid Feature Geometry

- Defining fully constrained profiles using SolidWorks sketch relations
- Extruding base features and boss cuts using boundary conditions
- Generating revolved geometries and circular patterns using reference axes
- Authoring swept bodies and guided loft features using sketches
- Build: Parametric Solid Component and Revolved Housing Model

### Day 2: Constructing Mechanical Assemblies and Product Data Structures

- Applying concentric and coincident mates using SolidWorks assembly tools
- Integrating mechanical gear mates and limit mates between components
- Generating automated bills of materials using custom property links
- Creating exploded assembly views and trace lines using configurations
- Build: Multi-Component Kinematic Assembly and Bill of Materials

### Day 3: Generating Production Drawings and Standardised Drafting Sheets

- Projecting orthographic and auxiliary views using ISO 128 conventions
- Inserting standard parametric dimensions aligned with ISO 129 specifications
- Configuring broken-out sections and detailed crop views in sheets
- Customising title block templates and sheet formats using tables
- Build: Standardised Two-Dimensional Engineering Production Drawing Set

### Day 4: Applying Geometric Tolerancing and Model-Based Definition Controls

- Assigning datum reference frames complying with ASME Y14.5-2018 standards
- Applying positional and profile tolerances using SolidWorks DimXpert tools
- Validating digital product definitions using ASME Y14.41-2019 guidelines
- Conducting automated tolerance stackup studies using SolidWorks TolAnalyst
- Build: Annotated Model-Based Definition and Toleranced Drawing Package

### Day 5: Executing Production Deliverables in Practical Software Lab

- Resolving complex assembly mate interferences using collision detection tools
- Revising parametric sketch geometry and associated drawing view updates
- Auditing drawing dimension annotations against ASME Y14.100 drafting guidelines
- Publishing lightweight digital files using SolidWorks eDrawings viewer tools
- Build: Production-Ready SolidWorks 3D CAD Model and Engineering Drawing Package



## Skills You Will Gain:

- SolidWorks Parametric Feature Authoring
- Mechanical Kinematic Mate Assignment
- Bill of Materials Property Linking
- ISO 128 Engineering View Generation
- ASME Y14.5-2018 Datum Referencing
- SolidWorks DimXpert Tolerance Allocation
- ASME Y14.41-2019 Digital Product Definition
- TolAnalyst Tolerance Stackup Evaluation

## Why Attend This Course:

- Construct robust parametric solid models and assemblies in SolidWorks that update dynamically without rebuild errors
- Standardise drawing sheet layouts using ISO 128 projection rules and automated bills of materials to accelerate drafting handoffs
- Apply precise geometric tolerances using ASME Y14.5-2018 controls and DimXpert tools to eliminate manufacturing ambiguities
- Deliver a complete Production-Ready SolidWorks 3D CAD Model and Engineering Drawing Package that validates component fit and drafting compliance

## Conclusion:

Returning to your organisation, you will immediately open your Production-Ready SolidWorks 3D CAD Model and Engineering Drawing Package to audit your active project files for missing sketch constraints and broken external references. You will present the standardised sheet templates, automated bill of materials workflows, and model-based definition files to your lead design engineer and manufacturing team heads. After releasing the initial drawing set to the production floor, you will check shop-floor inspection records and assembly fit reports to verify that dimensional tolerances and datum references match manufacturing requirements precisely.

## Frequently Asked Questions FAQ:

### What will you be able to do after this SolidWorks 3D CAD Modeling and Engineering Drawings Training Course?

You will be able to create parametric 3D models, build mechanical assemblies, and draft standard-compliant production drawings in SolidWorks. You will define precise geometric relations, apply ASME Y14.5-2018 tolerances using DimXpert, generate automated bills of materials, and export model-based definition packages for manufacturing.



## What do you need to know before starting this SolidWorks 3D CAD Modeling and Engineering Drawings Training Course?

You need foundational knowledge of basic engineering graphics, mechanical drafting concepts, and general computer navigation. Prior experience in professional 3D CAD authoring or advanced geometric dimensioning is not required, as this practitioner-level course guides you methodically through core modeling, assembly mating, and drawing creation techniques.

## What deliverable do you build during this SolidWorks 3D CAD Modeling and Engineering Drawings Training Course?

You build a Production-Ready SolidWorks 3D CAD Model and Engineering Drawing Package. This deliverable includes fully constrained 3D parts, an articulated multi-component assembly, an automated bill of materials, ISO-compliant two-dimensional drawing sheets, and an ASME Y14.5-2018 annotated model-based definition set.

## How does this SolidWorks 3D CAD Modeling and Engineering Drawings Training Course differ from a general CAD drafting course?

This course focuses on parametric 3D solid modeling, mechanical assembly kinetics, and international drafting standards rather than generic two-dimensional vector drafting. You learn bi-directional associative modeling, automated tolerance stackup evaluation with TolAnalyst, and digital product definition rather than drawing disconnected static lines.

