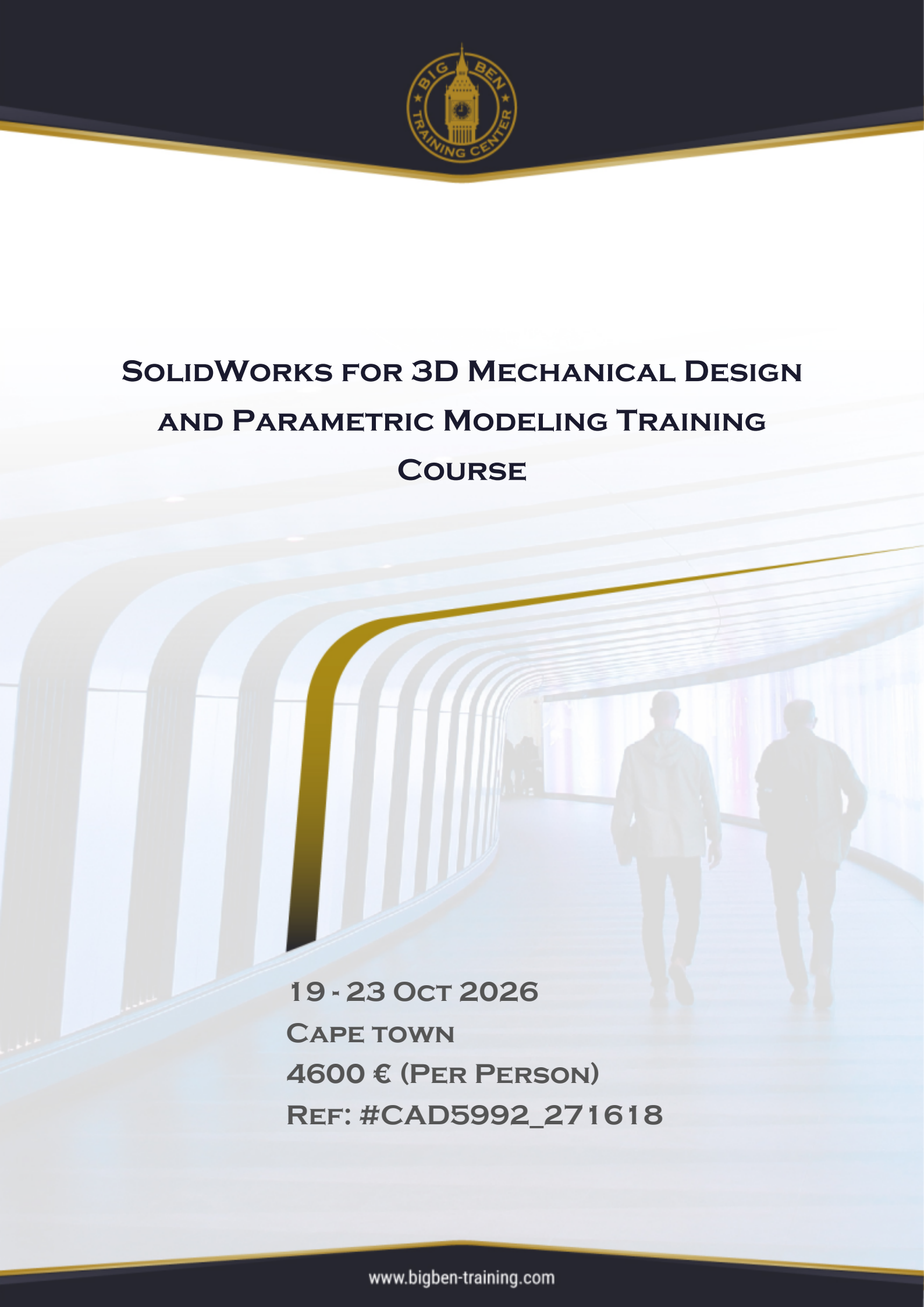
SolidWorks for 3D Mechanical Design and Parametric Modeling Training Course



19 - 23 Oct 2026

Cape town

4600 € (Per Person)

Ref: #CAD5992_271618

Course Introduction / Overview:

This course provides a comprehensive exploration of SolidWorks, the industry-standard software for 3D parametric modeling and mechanical design. Participants will journey from fundamental principles to advanced applications, mastering the tools and methodologies required to transform innovative ideas into detailed, manufacturable 3D models. The curriculum is built upon the core concept of design intent, ensuring that every model is robust, flexible, and easily modifiable. As highlighted by Prof. Sham Tickoo in his acclaimed book "SolidWorks 2023 for Designers," true proficiency in CAD extends beyond mere command execution to a deep understanding of parametric relationships and assembly architecture. This training program, offered by BIG BEN Training Center, emphasizes this holistic approach. We delve into part modeling, complex assembly creation, professional engineering drawing generation, and design validation techniques. By integrating theoretical knowledge with extensive hands-on practice, this course equips engineers and designers with the critical skills to enhance productivity, reduce design errors, and accelerate the product development lifecycle in a competitive global market. It is the definitive training for anyone serious about achieving mastery in computer-aided mechanical design.

Target Audience / This training course is suitable for:

- Mechanical Engineers.
- Design Engineers.
- Product Designers.
- Industrial Designers.
- CAD Technicians and Drafters.
- Engineering Students and Graduates.
- R&D Professionals.
- Manufacturing Engineers.
- Project Engineers involved in product development.

Target Sectors and Industries:

- Manufacturing and Industrial Production.
- Automotive and Transportation.
- Aerospace and Defense.
- Consumer Goods and Electronics.
- Industrial Machinery and Equipment.
- Medical Device Manufacturing.
- Energy and Power Generation.
- Governmental bodies and public sector engineering projects.
- Consulting Engineering Firms.

Target Organizations Departments:

- Engineering and Design.
- Research and Development (R&D).
- Product Development.
- Manufacturing and Production.
- Prototyping and Testing.
- Quality Assurance and Control.
- Technical Documentation.
- Project Management.

Course Offerings:

By the end of this course, the participants will have able to:

- Navigate the SolidWorks user interface with confidence and efficiency.
- Create and constrain 2D sketches with a clear understanding of design intent.
- Develop robust 3D parametric part models using a variety of essential features.
- Apply advanced modeling techniques such as sweeps, lofts, and surface modeling.
- Construct and manage complex mechanical assemblies using various mating techniques.
- Differentiate between and apply bottom-up and top-down assembly methodologies.
- Generate professional, standards-compliant 2D engineering drawings from 3D models.
- Create detailed documentation, including Bills of Materials (BOMs) and annotations.
- Perform basic design validation using simulation and interference detection tools.
- Design specialized components for sheet metal and weldment applications.
- Prepare models for visualization and manufacturing processes.

Course Methodology:

The training methodology at BIG BEN Training Center is designed to be immersive, practical, and highly interactive, ensuring that participants not only learn the software but also understand its real-world application. Our approach moves beyond simple lectures, focusing on hands-on learning through a series of carefully curated exercises and projects that build in complexity. Each module is structured around practical case studies drawn from various industries, allowing participants to solve tangible engineering problems. The sessions are a blend of expert-led instruction, live demonstrations, and individual practice time, providing a balanced learning environment. Collaborative group activities are integrated to encourage peer-to-peer learning and simulate a team-based project environment. Continuous feedback is a cornerstone of our method; instructors provide personalized guidance and conduct regular Q&A sessions to address individual challenges and reinforce key concepts. This active learning model ensures that participants leave the course with not just theoretical knowledge, but also the practical skills and confidence to apply SolidWorks effectively in their professional roles.

Course Agenda (Course Units):

Unit One: Foundations of SolidWorks and Parametric Sketching

- Introduction to the SolidWorks User Interface and command manager.
- Navigating the 3D space, view manipulation, and display styles.
- The principles of parametric modeling and design intent.
- Creating 2D sketches using lines, arcs, circles, and splines.
- Applying geometric relations and smart dimensions for robust sketches.
- Using basic part modeling features like Extruded Boss/Base and Revolved Boss/Base.
- Understanding the Feature Manager Design Tree and model history.

Unit Two: Advanced Part Modeling Techniques

- Creating complex geometry with Swept and Lofted Boss/Base features.
- Utilizing the Hole Wizard for standardized hole creation.
- Applying Fillet and Chamfer features for finishing models.
- Using linear, circular, and sketch-driven patterning tools.
- Creating thin-walled parts with the Shell feature.
- Developing structural components with the Rib feature.
- Introduction to multi-body part design and its applications.

Unit Three: Building and Managing Complex Assemblies

- Understanding bottom-up and top-down assembly design methodologies.
- Inserting components and creating standard and advanced mates.
- Working with sub-assemblies to organize complex designs.
- Detecting and resolving interferences and collisions in assemblies.
- Creating exploded views for assembly documentation and presentations.
- Generating and customizing a Bill of Materials (BOM).
- Introduction to basic motion analysis using Motion Study.

Unit Four: Creating Professional Engineering Drawings

- Creating standard drawing views from part and assembly models.
- Adding model items, smart dimensions, and annotations.
- Generating section, detail, and auxiliary views for clarity.
- Understanding and applying Geometric Dimensioning and Tolerancing (GD&T) symbols.
- Creating assembly drawings with balloons and BOM tables.
- Customizing drawing templates and sheet formats.
- Preparing drawings for release and manufacturing.

Unit Five: Advanced Applications and Design Validation

- Introduction to sheet metal design, including base flanges and bends.
- Creating structural members using the Weldments feature.
- Performing basic stress analysis with SimulationXpress to validate designs.
- Introduction to rendering and visualization with SolidWorks Visualize.
- Preparing models for 3D printing and other manufacturing processes.
- Best practices for file management and data organization.
- Course review, final project, and Q&A session.

FAQ:

Qualifications required for registering to this course?

There are no requirements.

How long is each daily session, and what is the total number of training hours for the course?

This training course spans five days, with daily sessions ranging between 4 to 5 hours, including breaks and interactive activities, bringing the total duration to 20 - 25 training hours.

Something to think about:

How might the integration of generative design and artificial intelligence with parametric modeling platforms like SolidWorks redefine the role of the mechanical design engineer in the next decade?

What unique qualities does this course offer compared to other courses?

This course distinguishes itself by focusing on the 'why' behind the 'how'. While many training programs concentrate solely on teaching software commands, our curriculum is built around the core engineering principle of design intent. We teach participants to think like experienced designers, constructing models that are not only accurate but also intelligent, robust, and easily adaptable to future changes. This forward-thinking approach saves invaluable time and resources in the product development lifecycle. Furthermore, the course content is deeply rooted in practical, real-world applications, using case studies that mirror the challenges professionals face daily. Instead of abstract exercises, participants work on projects that require them to consider manufacturability, assembly logic, and documentation standards from the outset. Our methodology emphasizes problem-solving and critical thinking, ensuring that graduates can do more than just operate the software; they can leverage it as a powerful tool to innovate and optimize mechanical designs. This holistic perspective, combining technical proficiency with strategic design thinking, provides a far deeper and more valuable learning experience.