

Autodesk Associate in CAD for Mechanical Design

Target Audience

This course is designed for aspiring CAD technicians, mechanical designers, and engineering professionals who want to strengthen their foundational skills in 3D mechanical design using Autodesk CAD software. It is suitable for those entering the job market or looking to transition into mechanical design roles across industries such as aerospace, automotive, defense, industrial design, manufacturing, medical, and energy sectors

Course Objective

This course is designed to equip participants with essential knowledge and hands-on skills in 3D component modeling, assembly creation, and technical drawing documentation using Autodesk CAD tools. Learners will develop the ability to create precise 3D parts, manage complex assemblies, and produce detailed technical drawings that align with manufacturing and engineering standards. The course content is aligned with the competencies required for the Autodesk Certified Associate in CAD for Mechanical Design certification, preparing learners to validate their skills and advance their careers in mechanical design.

Course Outcome

- **3D Component Modeling Skills** – Gain expertise in creating and modifying 3D sketches, solid features, and freeform parts using robust CAD tools.
- **Assembly Creation & Motion Simulation** – Learn to assemble and manage components, create motion with joints, and inspect for interferences.
- **Technical Drawing & Detailing Proficiency** – Master the production of detailed technical drawings, placing multiple views, and annotating designs effectively.
- **Project and File Management** – Understand how to structure projects, manage file collaboration, and prepare designs for manufacturing or further development.
- **Inspection & Analysis Capabilities** – Develop skills to measure, analyze, and review models for accuracy and manufacturability.

Course Outline: The course comprises **40 hours** of theory and practical labs and is divided into **3 comprehensive chapters**. Each chapter will be followed by hands-on lab exercises to reinforce learning and assess understanding of the topics covered.

Chapter 1. 3D component modeling and project files

Creating Project File Structures

- Creating digital projects
- Importing data (e.g., STEP or intermediate CAD formats)
- Creating share links
- Inviting collaborators to a project

Creating and Modifying Sketches

- Creating sketches
- Applying dimensions (length, diameter, radius, angle)
- Applying constraints (horizontal/vertical, parallel, perpendicular)
- Selecting and deleting sketch constraints
- Creating sketch projections from edges or faces

Creating Construction Planes and Axes

- Creating construction planes
- Creating construction axes

Creating and Modifying 3D Solid Features

- Creating solid features (extrude, revolve, sweep, loft, counterbore hole, threaded hole)
- Creating feature patterns
- Applying fillets and chamfers
- Using shell features
- Using split to divide faces and bodies (including removing faces)
- Modifying designs, features, or sketches

Inspecting and Analyzing Models

- Using measure tools
- Using section analysis
- Defining WCS offset in CAM setups
- Defining machine configurations in Fusion 360

Using Direct Modeling Features

- Using press-pull tools
- Deleting features
- Moving/copying features

Creating and Modifying Freeform Parts

- Creating freeform primitives (e.g., sphere forms)



Chapter 2. 3D Assembly Modeling and Management

Creating and Organizing Assembly Components

- Creating components
- Organizing and managing assembly components
- Inserting fasteners

Creating Motion with Assembly Joints

- Using align and capture position tools
- Applying as-built joints (all joint types)
- Applying standard joints (all joint types)
- Creating rigid groups of components

Creating and Managing Motion Links

- Creating motion links

Applying Assembly Interference Inspection Tools

- Managing component positions for interference detection and mechanical review
- Using interference tools to check for component overlap

Chapter 3. Technical Detailed Drawing Creation

Creating Technical Drawings

- Creating detailed drawings from designs
- Placing views on drawing sheets (base, projected, detail, section)