

# Autodesk Certified Associate in CAD for Mechanical Design

Exam objectives

## Target audience

The Autodesk Certified Associate (ACA) certification is designed for candidates with essential knowledge and skills in Autodesk software who are ready to enter the job market or improve their skills in pursuit of a new career path. Becoming an Autodesk Certified Associate is an excellent way for individuals with approximately 150 hours of Autodesk software experience to validate their product or workflow skills.

Candidates who obtain this certification will have demonstrated mechanical design skills for jobs as a CAD technician/mechanical designer in a competitive environment. This exam covers common skills that can be applied across a wide range of engineering and design industries, including aeronautical, aerospace, defense, automotive, mechanical, industrial design, manufacturing, medical, and energy.

## Prerequisite skills

It's expected that candidates will already know how to:

- Navigate the user interface.
- Identify areas of the browser and timeline.
- Transition through various workspaces.
- Know how to create a project.
- Create basic sketches.
- Use Extrude, Hole, Shell, and Revolve tools.
- Understand dimensions and constraints.
- Create construction planes and axes.
- Inspect geometry with section analysis and measure.
- Modify geometry with fillets, chamfers, and patterns.
- Use Press/Pull and Delete for direct editing.
- Create and manage assemblies.
- Create assembly components from bodies.
- Create empty assembly components.

- Understand assembly joints, rigid groups, and interference.
- Create a motion link.
- Create drawings with views, annotations, and title blocks.
- Create sweeps, lofts, combines, and splits.
- Create, edit, and thicken basic forms.

## Exam objectives

Here are some topics and software features that may be covered in the exam.

### 1. Project setup

#### 1.1. Create a project file structure

- 1.1.a Digital project creation
- 1.1.b Sub-folder design and management
- 1.1.c Import of legacy data

### 2. 3D component modeling

#### 2.1. Create and modify sketches

- 2.1.a Create a sketch on a plane or planar face
- 2.1.b Edit a sketch
- 2.1.c Apply dimensions to a sketch
  - i. May include length, diameter, radius, and angle.
- 2.1.d Apply constraints to a sketch
  - i. May include horizontal/vertical, parallel, or perpendicular.
- 2.1.e Select and delete a sketch constraint
- 2.1.f Create a sketch projection from an edge or face

#### 2.2. Create construction planes and axes

- 2.2.a Create an offset construction plane
- 2.2.b Create a construction axis

#### 2.3. Create and modify 3D solid features

- 2.3.a Create solid features
  - i. May include extrude, revolve, sweep, loft, counter bore hole, and threaded hole.
- 2.3.b Create a feature pattern
- 2.3.c Apply a fillet or chamfer
- 2.3.d Create a thin-wall body with Shell
- 2.3.e Use Split to divide faces and bodies

2.3.f Use Combine to join bodies together

## **2.4. Inspect and analyze models**

2.4.a Use Measure to inspect a model

2.4.b Use Section Analysis to inspect a model

## **2.5. Use direct modeling features**

2.5.a Demonstrate how to use the Press Pull tool

2.5.b Use Delete to remove a feature

## **2.6. Create and modify freeform parts**

2.6.a Create a primitive box form

2.6.b Create a primitive sphere form

2.6.c Use Edit Form to scale a selection

2.6.d Use Edit Form to translate a selection

2.6.e Use Edit Form to rotate a selection

2.6.f Use Thicken to convert a surface to a solid form body

# **3. 3D assembly modeling and management**

## **3.1. Create and organize assembly components**

3.1.a Create a component from a body

3.1.b Create a new empty component

3.1.c Organize and manage assembly components

## **3.2. Create motion with assembly joints**

3.2.a Use Align and Capture Position to position components

3.2.b Apply an as-built revolute joint

3.2.c Apply a slider joint

3.2.d Create a rigid group of components

## **3.3. Create and manage motion links**

3.3.a Create a motion link

3.3.b Edit a motion link

## **3.4. Apply assembly interference inspection tools**

3.4.a Manage assembly component's position

3.4.b Use Interference to check for component overlap

# **4. Technical detailed drawing creation**

#### **4.1. Create a basic technical drawing**

4.1.a Create a detailed drawing from a design

4.1.b Place views on a drawing sheet

i. May include base, projected, detail, or section.

4.1.c Edit a drawing view

4.1.d Add drawing model dimensions and notes

4.1.e Modify a drawing title block