AUTODESK

Autodesk Certified Professional in Design for Manufacturing

Exam objectives

Target audience

The Autodesk Certified Professional (ACP) certification is designed for candidates who have advanced skills and can solve complex challenges in workflow and design. This type of experience typically comes from having worked with the software on a regular basis for at least two years, or equivalent to approximately 400 hours (minimum) to 1,200 hours (recommended) of Autodesk software experience. Certification at this level demonstrates a comprehensive skill set that provides an opportunity for individuals to stand out in a competitive job market.

Candidates who obtain this certification will have demonstrated advanced skills in computer-aided design (CAD) for manufacturing using Fusion 360. The certification exam will also validate a candidate's ability to create designs and documentation for specific manufacturing processes. These skills are in demand 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.
- Transition through various workspaces.
- Interact with general CAD file formats.
- Work with a component or assembly.
- Understand design requirements for sheet metal, molding, casting, subtractive, and additive manufacturing.
- Identify and create various planes and axes.
- Create fully constrained sketches with advanced sketch entities (e.g., polygon, spline).
- Use Parameters in a sketch.

- Use extrude, hole, thread, rib, web and draft tools.
- Use advanced tool controls for end conditions.
- Create and break distributed (i.e., reference or linked) and derived designs.
- Fully position assembly components and control joint limits.
- Identify and isolate components and control their opacity.
- Use component color cycling and color swatch.
- Define sheet metal rules.
- Create a sheet metal flange.
- Create a sheet metal bend.
- Use unfold/refold to add holes across a bend.
- Create a flat pattern.
- Create an exploded view animation.
- Create and use named views in a design and drawing.
- Create a detailed drawing title block template.
- Insert a parts table and balloons into a detailed drawing.
- Use symbols and notes in a detailed drawing.
- Set up and control a render scene.
- Use and modify component appearances.
- Produce in-canvas and cloud rendered images.
- Create surface bodies using extrude, revolve and patch.
- Convert surfaces to solids using thicken and stitch.
- Create and control form bodies.
- Use form tools to insert, remove, or modify edges.
- Use form tools to bridge, blend, and smooth a form body.
- Use physical materials and measure mass properties.

Exam objectives

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

1. Manufacturing design rules

1.1. Outline design for subtractive manufacturing

1.1.a Apply knowledge of subtractive manufacturing methods.

1.1.b Explain the principles of material removal and tool access.

1.1.c Operate the software evaluation tools for minimum radius and tool access.

1.2. Outline design for additive manufacturing

1.2.a Discuss the types of additive machines.

1.2.b Explain the principles of support material and design requirements for each method.

1.2.c Operate the software evaluation and export tool for additive manufacturing.

i. May include section analysis.

1.3. Outline design for drafted applications

1.3.a Discuss the general design guidelines for injection molding.

1.3.b Explain the general design guidelines for casting.

1.3.c Operate the software tools for part evaluation for draft.

1.4. Outline design for sheet metal manufacturing

1.4.a Discuss the types of sheet metal manufacturing tools.

1.4.b Explain basic sheet metal design language.

2. 3D component modeling

2.1. Create and modify sketches

2.1.a Create advanced sketch entities.

i. May include fit and control point splines and conic curves.

2.1.b Create sketch patterns.

2.1.c Create intersection curves.

2.1.d Create and convert construction geometry.

2.1.e Create and manipulate User Parameters.

i. May include global parameter creation and linking parameters to sketch dimensions and feature dimensions.

2.1.f Create advanced sketch constraints.

i. May include symmetry and curvature.

2.1.g Create 3D sketch entities.

2.2. Create construction planes and axes

2.2.a Create construction planes and axes.

i. May include midplane, plane along path or vertex.

2.3. Create and modify 3D solid features

2.3.a Create an extrude feature.

i. May involve going from or to an object or with taper.

2.3.b Create advanced hole and thread features.

2.3.c Create ribs and webs on a model.

2.3.d Apply draft to a model.

2.4. Create and modify 3D surface features

2.4.a Create surface features.

i. May include extrude, revolve, sweep, or patch.

2.4.b Create a solid from a thickened surface.

2.4.c Use stitch to combine surfaces.

2.5. Create and modify freeform parts

2.5.a Form bodies from a primitive.

i. May include quad balls, spheres, cylinder, face, etc.

2.5.b Form bodies from a sketch.

i. May include sweeps, lofts, pipe, etc.

2.5.c Use advanced edit form controls for soft modification.

2.5.d Create or modify edges with form tools.

2.5.e Modify a form with bridge.

2.5.f Repair or smooth a form body.

2.6. Create and modify sheet metal parts

2.6.a Define sheet metal rules.

2.6.b Create sheet metal base flanges and bends.

2.6.c Modify a sheet metal part.

i. May include unfold/refold or hole creation.

2.6.d Export a sheet metal design.

i. May include flat patterns or dxf file creation.

2.7. Demonstrate view controls

2.7.a Create a named view.

2.7.b Change the default view.

3. 3D assembly modeling and management

3.1. Create distributed and derived designs

3.1.a Create and break a design.

i. May include distributed or derived.

3.2. Create motion with assembly joints

3.2.a Create a joint origin.

3.2.b Apply higher degree of freedom joint types.

3.2.c Control joint limits.

3.2.d Create rigid groups.

3.3. Demonstrate component control

3.3.a Use Isolate to focus attention on a component.

3.3.b Control component opacity.

3.3.c Use Component Color Swatch and Color Cycling.

3.4. Control component physical materials

3.4.a Apply a physical material to a component.

3.4.b Measure component mass properties.

4. Create exploded view animations

4.1. Create a storyboard

4.1.a Create a storyboard.

i. May include from current animation or clean.

4.2. Manipulate component positions with transform

4.2.a Manually explode components.

i. May include Manual Explode, Transform Component

5. Technical detailed drawing creation

5.1. Create a technical drawing

5.1.a Create a new drawing.

i. May include from storyboard, assembly, or sheet metal.

5.2. Create technical drawing templates

5.2.a Create a title block template.

5.3. Create technical drawing elements

5.3.a Create a drawing view parts table.

5.3.b Renumber drawing view balloons.

5.3.c Use GD&T drawing symbols.

5.3.d Create a drawing annotation.

6. Rendered image creation

6.1. Set up a render scene

6.1.a Select a scene environment.

6.1.b Control scene settings.

6.1.c Change scene camera settings.

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6.2. Control render appearances

6.2.a Apply and modify appearances.

i. May include bodies or faces.

6.3. Create renderings

6.3.a Produce a rendered image.

i. May include in-canvas or cloud render.

6.3.b Produce a turn table render.