

Autodesk Certified Expert in Generative Design for Manufacturing

Exam Objectives

Target audience

The Autodesk Certified Expert (ACE) certification is a true differentiator for candidates looking to get ahead in their career. Candidates who hold this certification possess not only expert-level knowledge and skill, they're also leaders in their industries and pioneer innovation in their organizations. Preparing to become an Autodesk Certified Expert typically comes from a progressive development of skills and knowledge of emerging toolsets, equivalent to approximately 400 hours (minimum) to 1,200 hours (recommended) of software experience.

Candidates who obtain this certification will have demonstrated expert-level skills in defining, running, and post processing generative design studies for various manufacturing applications, including additive manufacturing, performance and weight reduction, industrial applications, and part consolidation. These skills are in demand for mechanical engineers in a competitive environment for manufacturing.

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.
- Know the available file types.
- Display a part or assembly.
- Create fully constrained sketches.
- Use extrude, loft, revolve and other basic tools.
- Modify geometry with fillets and chamfers.
- Use form tools to create and modify form body geometry.
- Use mesh tools to smooth, repair and manipulate mesh bodies.
- Create surface extrudes, revolve and patches.
- Create and manage assemblies and assembly motion.
- Use Edit Model in a generative design study to prepare a design.
- Define generative design study materials.
- Define generative design starting shape, preserve and obstacle geometry.
- Create loads and constraints.

- Define generative design study objectives.
- Define generative design study manufacturing methods.
- Adjust and explain generative design study synthesis resolution.
- Use the generative design previewer and advanced physics.
- Solve and review generative design outcomes.
- Use the generative design explore tools.
- Create a design from an outcome.

Exam objectives

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

1. Required General and Modeling Knowledge

1.1. Create Digital Components

- 1.1.1. Create a fully dimensioned and constrained sketch
- 1.1.a. Create a 3D model using features
- 1.1.b. Modify a model with fillets and chamfers
- 1.1.c. Apply surface features to create or patch complex shapes

1.2. Create Digital Assemblies

- 1.2.a. Create and remove assembly components
- 1.2.b. Use joints to create assembly motion

1.3. Create and Modify Freeform Parts

- 1.3.a. Create and manipulate basic form bodies
- 1.3.b. Use form tools to remove and patch geometry
- 1.3.c. Use form utilities to repair and smooth form bodies

1.4. Modify Mesh Bodies

- 1.4.a. Demonstrate how to insert a mesh
- 1.4.b. Modify a mesh body with smooth, reduce and remesh
- 1.4.c. Use Erase and Fill on a mesh body

1.5. ID Problems to solve with generative

- 1.5.a. Identify problem statements and determine applicable design path

2. Generative Design Model Preparation

2.1. Utilize the Edit Model Workspace

- 2.1.a. Create a connector obstacle feature
- 2.1.b. Replace components with primitives
- 2.1.c. Remove features and faces
- 2.1.d. Remove components
- 2.1.e. Create a clone of a generative model

3. Generative Study Setup

3.1. Set Up the Generative Design Space

- 3.1.a. Select preserve geometry
- 3.1.b. Select obstacle geometry
- 3.1.c. Select a starting shape
- 3.1.d. Modify generative design synthesis resolution

3.2. Define Generative Design Conditions

- 3.2.a. Define structural constraints
- 3.2.b. Define structural loads
- 3.2.c. Create a clone of structural loads
- 3.2.d. Create a clone of a load case

3.3. Determine Generative Design Criteria

- 3.3.a. Define generative design objectives and limits
- 3.3.b. Recommend general manufacturing method settings
- 3.3.c. Explain milling manufacturing settings
- 3.3.d. Explain die casting manufacturing settings (preview)
- 3.3.e. Explain additive manufacturing settings

3.4. Examine Generative Materials

- 3.4.a. Define study materials
- 3.4.b. Demonstrate adding materials to a favorite library

3.5. Create a Generative Preview

- 3.5.a. Preview a generative solve

4. Solve and Review a Generative Study

4.1. Solve a Generative Study

- 4.1.a. Generate a study

4.2. Explore Generative Study Outcomes

- 4.2.a. Explore a generative outcome
- 4.2.b. Filter and compare generative outcomes

4.3. Create an Editable Generative Design

- 4.3.a. Create a design from a selected outcome
- 4.3.b. Create a mesh from a selected outcome