AUTODESK

Exam objectives

Autodesk Certified Professional in Revit for Mechanical Design

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 Revit and will be knowledgeable in relevant mechanical design workflows, processes, and project objectives. The candidate will have performed routine tasks involved in their job role with limited assistance from peers, product documentation, and support services.

The minimally qualified candidate will have leveraged Revit data, documentation tools, and methodologies to produce quality deliverables in projects. These skills are typically required for jobs as mechanical engineers, mechanical designers, or BIM managers in architecture or MEP engineering firms or a design-build environment.

Prerequisite skills

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

- Demonstrate advanced modeling skills, including creating and modifying systems, analytical spaces, and ducts and pipes.
- Perform basic family editing, including connectors, annotations, symbology, and content behavior.
- Use worksharing methods and understand worksets.
- Effectively import and link external files and correctly use positioning.
- Export files to different formats.
- Demonstrate the functionality of parameters and data types.

- Manipulate views and their behaviors, including modeling, drafting, filters, templates, and system browser.
- Successfully create and edit project documents.
- Leverage Revit data, including parameters, constraints, geometry, schedules, and tagging.
- Demonstrate the basics of working with analytical systems.
- Leverage model groups.
- Apply project phasing.
- Use revisions.
- Run an interference check.

Exam objectives

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

You won't have access to the software during the exam, as all questions are in a selected response format and are designed to be answered without the software user interface. Learn more about our exam format and question types in our Autodesk Certification FAQs.

Exam outline

Here are some topics and software features that may be covered in the exam. The table lists the main content domains and their weightings, followed by. The complete exam content outline.

Exam domain	% on exam
Mechanical system design and analysis	**18%**
Modeling concepts	**25%**
Family concepts	**16%**
Project management	**23%**
Documentation	**18%**

1. Mechanical system design and analysis

1.1. Translate engineering design and calculations into mechanical system design

1.1.a Choose family equipment sizes based on required loads.

1.1.b Incorporate sketches into mechanical system design.

1.2. Create analytical systems and elements

1.2.a Create system zones.

1.2.b Create analytical systems or elements.

1.3. Manage mechanical settings

1.3.a Manipulate flow calculations.

1.3.b Manage duct settings and pipe settings.

1.4. Create and manipulate mechanical and plumbing building systems

1.4.a Create duct settings and pipe settings.

1.4.b Set routing preferences.

1.4.c Create system relationship between elements.

1.5. Analyze pipe and duct systems

1.5.a Verify flow performance in elements.

1.5.b Utilize pipe and duct color legends.

1.5.c Perform pressure drop calculations.

2. Modeling concepts

2.1. Refine and review mechanical system designs according to project requirements and performance

2.1.a Utilize HVAC, plumbing, piping, and fire protection.

2.1.b Define materials used.

2.1.c Manage segments and sizes.

2.2. Isolate and fix modeling issues

2.2.a Load and use families.

2.2.b Correct model errors.

2.2.c Analyze and resolve warnings.

2.3. Place mechanical and plumbing equipment/devices

2.3.a Create target source equipment.

2.3.b Demonstrate understanding of placement types (hosted vs. non-hosted).

2.4. Create and modify basic elements

2.4.a Modify parametric elements.

2.4.b Duplicate family types.

2.4.c Create components.

i. May include detail and model components)

2.5. Model duct, pipe, and accessories

2.5.a Model groups.

2.5.b Generate layouts.

2.5.c Update or modify duct and pipe routing preferences.

2.6. Model fabrication and installation detail to produce documentation

2.6.a Illustrate at different levels of detail.

2.6.b Model insulation detail.

3. Family concepts

3.1. Model family elements

3.1.a Define MEP connectors.

i. May include duct, pipe and electrical.

3.1.b Demonstrate understanding of family types: System and component.

i. May include duct and pipe, types and loadable families, and type catalogs.

3.1.c Demonstrate understanding of family creation workflow.

i. May include working with reference planes, constraints, and solid geometry.

3.1.d Determine family category and part type.

i. May include adding, renaming, and setting family types, and editing properties of a family type.

3.1.e Differentiate between family hosting types.

3.1.f Configure element visibility settings.

i. May include object styles, subcategories, detail level, and element visibility.

3.2. Create annotation families

3.2.a Create annotation families and tags.

i. May include creating labels, tags and combining parameters.

3.2.b Define symbols and annotations in a family.

i. May include nested generic annotations and symbolic lines.

3.3. Add parameters

3.3.a Use and understand parameter types.

i. May include family, shared, system, project, global, instance, and type parameters.

3.3.b Distinguish between parameter disciplines and data types.

3.3.c Demonstrate understanding of type and instance parameters and how they affect the model.

4. Project management

4.1. Coordinate with architects, structural engineers, and other mechanical designers to resolve clashes and ensure a cohesive design

4.1.a Run interference check.

4.1.b Coordinate mechanical layouts with structural and building systems.

4.2. Collaborate with team members and external consultants with other file formats

4.2.a Manage links.

4.2.b Export to different formats.

i. May include export view settings, saving views to new files and exporting Revit content for other collaboration uses.

4.3. Adjust a model based on design performance and coordination issues

4.3.a Complete a coordination review.

i. May include copy monitor behavior, grids, levels, and other objects.

4.4. Deploy project standards

4.4.a Transfer project standards from links.

4.4.b Insert views from external models.

4.4.c Manage project information.

4.5. Manage project files and coordinate with other disciplines using linked models.

4.5.a Utilize copy monitor process.

4.5.b Set up a project with shared coordinates.

4.5.c Demonstrate understanding of shared positioning.

i. May include determining what would cause a linked file to move unexpectedly.

4.6. Identify worksharing concepts

4.6.a Distinguish differences between live linking and shared and consumed approach.

4.6.b Identify workset features.

4.7. Set up Revit projects, ensuring proper templates, families, and standards are in place

4.7.a Utilize appropriate template file given starting content needs.

4.7.b Distinguish difference between .rte and .rvt files.

4.7.c Anticipate model limitations.

i. May include phases and design options.

5. Documentation

5.1. Manipulate views

5.1.a Assign, apply, and edit view templates and visibility and graphic overrides.

i. May include the use of view types and templates, the impact of modifying existing view templates, temporary view properties, and element visibility (excluding analytical elements); as well as filters, graphic overrides for linked files, object styles, and workset visibility control.

5.1.b Use miscellaneous view features.

i. May include view selection boxes, scope boxes, view range, plan regions, browser organization, import views, color fills, phase filters and overrides.

5.1.c Produce schedules.

i. May include building components, key schedules, embedded schedules, and linked models.

5.1.d Understand all view types.

i. May include drafting, legend, callout, section/detail, elevation, dependent, and 3D views.

5.1.e Apply phasing.

i. May include using element phase settings, phase filters, and phase graphics overrides.

5.2. Develop equipment lists and schedule criteria for components in a mechanical system

5.2.a Work with parameters within schedules.

5.2.b Create combined and calculated parameters.

5.2.c Apply conditional formatting and schedules.

5.2.d Schedule linked elements.

5.2.e Leverage filters.

5.3. Create documentation and annotations that leverage system data and information

5.3.a Use tags.

i. May include equipment, plumbing fixtures, duct and pipe, accessories, space, and air terminal tags.

5.3.b Use keynotes, note blocks, and numbered lists.

i. May include keynoting settings, user keynote table formatting, and keynote legends.

5.3.c Add dimensions, tags, and schedules to a model.

5.3.d Validate or confirm parameters.

5.4. Create sheets that communicate design intent

5.4.a Develop appropriate views that illustrate congested areas of a building.

i. May include section views, callouts, 3D views, etc.

5.4.b Create/modify view port types.

5.4.c Work with sheets, title blocks, and revisions.

i. May include revision numbering, issuing a revision, showing the tag and/or cloud, and using settings such as Per Project or Per Sheet.