

# Autodesk Certified Professional in Revit for Mechanical Design

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 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.

### 1. Modeling

#### 1.1. Add equipment and fixtures

##### 1.1 a Add mechanical equipment

i. May include air handling units, terminal units, pumps, tanks, chillers, and boilers.

##### 1.1 b Add plumbing fixtures

i. May include water closets, urinals, sinks, lavatories, showers, and drains.

##### 1.1 c Add air terminals

i. May include registers, grills, and diffusers.

##### 1.1 d Add fire protection sprinklers

#### 1.2. Create mechanical systems

##### 1.2 a Configure mechanical settings

i. May include duct and pipe settings.

##### 1.2 b Create duct systems

i. May include supply, return, and exhaust systems.

##### 1.2 c Create pipe systems

i. May include hydronic supply and return, domestic hot and cold water, sanitary, and fire protection systems.

##### 1.2 d Define analytical pipe connections

##### 1.2 e Use the System Browser

i. May include finding specific piping and mechanical systems.

#### 1.3. Model Connecting Geometry

##### 1.3 a Modify pipe and duct types

- i. May include editing routing preferences, and default fittings.
- 1.3 b Add duct components
  - i. May include ducts, fittings, and accessories.
- 1.3 c Add pipe components
  - i. May include pipes, fittings, and accessories.

## **2. Documentation**

### **2.1. Manipulate views**

- 2.1 a Assign, apply, and edit view templates and visibility/graphic overrides
  - i. May include the use of view types and templates and the implications of altering existing view templates; temporary view properties and element visibility (not including analytical), filters, graphic overrides for linked files and object styles, and controlling workset visibility.
- 2.1 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.
- 2.1 c Produce schedules
  - i. May include building components, key schedules, embedded schedules, and linked models.
- 2.1 d 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.
- 2.1 e Understand all view types
  - i. May include drafting, legend, callout, section/detail, elevation, dependent, and 3D views.
- 2.1 f Apply phasing
  - i. May include using element phase settings, phase filters, and phase graphics overrides.

### **2.2. Use annotations**

- 2.2 a Use tags
  - i. May include equipment, plumbing fixtures, duct/pipe, accessories, space, and air terminal tags.
- 2.2 b Use keynotes, note blocks, and numbered lists
  - i. May include keynoting settings, user keynote table formatting, and keynote legends.

## **3. Families**

### **3.1. Model family elements**

- 3.1 a Define MEP connectors
  - i. May include duct/pipe and electrical.
- 3.1 b Understand family types: System and component
  - i. May include duct and pipe, types and loadable families, and type catalogs.
- 3.1 c Understand family creation workflow

i. May include constraints, reference planes, lookup tables, geometry creation, nested families, and a basic knowledge of formulas.

### 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. Model 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 Understand syntax for equations and formulas

## 4. Analysis

### 4.1. Perform mechanical systems analysis

#### 4.1 a Adjust energy settings

i. May include location, building type, construction type, occupancy, and construction between schematic and detail.

#### 4.1 b Create system zones

#### 4.1 c Create analytical systems

i. May include air systems, water loops, and zone equipment.

#### 4.1 d Create energy model

#### 4.1 e Assign material thermal properties

i. May include construction types.

#### 4.1 f Review calculated values in model

i. May include analytical spaces and reports.

## 5. Collaboration

### 5.1. Use reference files

#### 5.1 a Understand the difference between imported and linked files

i. May include CAD files, images, PDFs, and positioning.

### 5.1b Manage linked files

- i. May include adding at the proper position, removing, loading, and reloading.

## **5.2. Define worksharing concepts**

### 5.2 a Understand worksharing concepts

- i. May include display models, worksets, central file, file synchronization, and element borrowing/relinquishing.

## **5.3. Collaborate with others**

### 5.3 a Export to different formats

- i. May include export options, file formats, and reports.

### 5.3 b Check a model for interferences

### 5.3 c Use copy and monitor data and model elements

- i. May include how to conduct a coordination review.

### 5.3 d Assign, display, and accept primary design options

- i. May include switching between design options and option sets.

### 5.3 e Transfer project standards