AUTODESK

Instructor guide

CAD projects

The CAD projects offer educators ready to use mechanical design challenges that simulate real world job scenarios that mechanical designers and product designers may come across in industry.

The CAD projects require students apply their knowledge and skills in CAD to common mechanical design challenges that involve design review, sketching, 3D modeling, assembly modeling, as well as designing for specific outcomes such as injection molding, 3D printing and second life design. Upon completing the CAD projects, students will have developed and practiced CAD skills utilized by mechanical designers across a variety of industries. They will also have the bonus of being able to show future employers digital models of their designs.

Teaching strategies

The CAD projects are structured to support a variety of teaching strategies and content needs. Whether you are looking for projects to refresh your curriculum or needing for additional resources to support diverse learners, the CAD projects can provide you with curriculum support that aligns to industry job skills and learning pathway to becoming certified as Autodesk Certified Associate in CAD for mechanical design.

Each project offers a CAD project, a practice exercise, and challenge exercise that is designed to graduate students from working with instructional support to working on their own. These modular learning experiences offer educators a selection of hands-on skill building activities to engage students as they develop their knowledge of mechanical design skills.

What is included with each project?

CAD project: Each CAD project requires 90-120 minutes to complete.

Project exercises:

Practice exercise: Requires 15-30 minutes to complete. Includes a video solution video offering guidance for completing the exercise.

Challenge exercise: 30-45 minutes to complete.

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Using these in the classroom

The CAD project can be implemented as independent projects or can be completed as a series. A couple of options are outline below:

Option 1: Self-paced

Each student will log into Autodesk.com/learning using their Autodesk Account credentials and follow along with the learning pathway. Students can work through the projects on their own by following the project challenge instructions and exploring any supporting assets. This is a great way to allow students to move through the learning materials at their own pace and explore additional learning opportunities or increase shop time. The self-paced option can also be used for out of classroom or remote assignments.

Option 2: Instructor led

In this option, instructors will log into Autodesk.com/learning using their Autodesk Account credentials and download the learning materials. An instructor guide and educator resources are found in the Instructor resources tab. Instructors can then guide the students through each project, using challenge exercises and machining best practices as their handouts. This option allows for guided, step-by-step classroom engagement. This approach works well in a more traditional classroom setting and will allow instructors to easily keep students on the same pace. CAD practices and challenge exercises can be also used for additional learning opportunities for students who complete their work early or are looking for additional hands on opportunities.

CAD projects

- **Design a mechanical assembly**

  Create a reciprocating saw mechanical assembly, including spur gears and links modify the drive ratio and linear travel of an assembly using Fusion 360.
- **Design for injection molding**

  Create a saw trigger model that can be injection molded using Fusion 360.
- **Create a concept model using freeform modeling**

  Design a concept model for a car body shape using Fusion 360 Forms.
- **Design a model for 3D printing**

  Create a micro drone chassis using Fusion 360 that can be produced using 3D printing.
- **Design products using freeform modeling**

  Create a second life laundry detergent bottle using Fusion 360 Forms.