

## CUSTOMER

**Arizona State University**

## LOCATION

**Tempe, AZ, USA**

## SOFTWARE

**Autodesk® Fusion 360™**

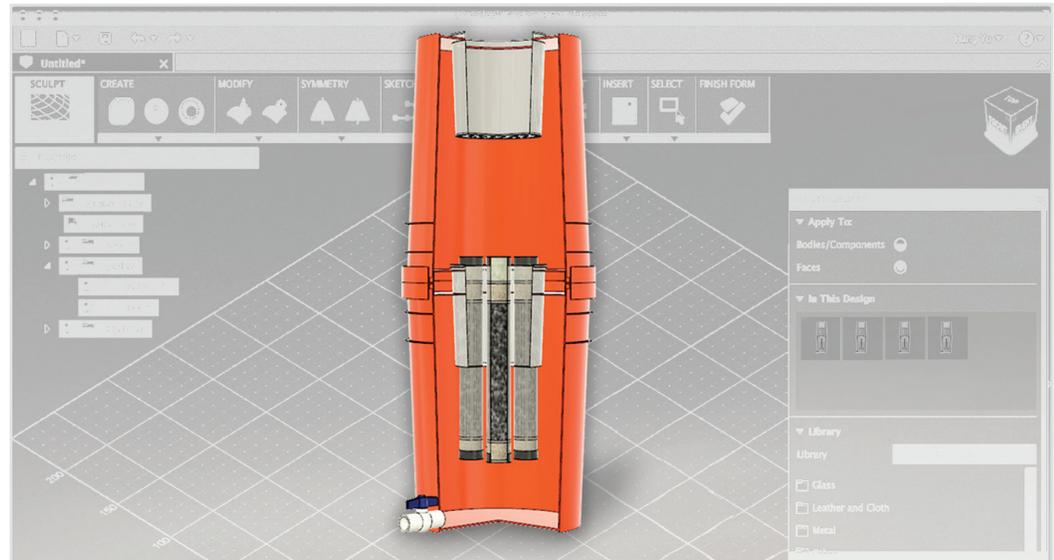
# ARIZONA STATE UNIVERSITY

## FRESHMAN TACKLE 3D

### Autodesk Fusion 360 helps first-year engineering students with 3D design

This is the twenty-first century, and students who used to do hand drawings are now using software to create solid models. In an introductory class for freshman students, it's very important to expose them to the tools of the future and see what they can do with them. Once they had the exposure and got excited, it was much easier for them to further explore the tools.

**HAOLIN ZHU PH.D.**  
**MECHANICAL ENGINEER, LECTURER**  
 ARIZONA STATE UNIVERSITY  
 IRA A. FULTON SCHOOLS OF  
 ENGINEERING



Water filtration system design render in Autodesk Fusion 360

**Each year, budding engineers at Arizona State University (ASU) take Introduction to Engineering to learn hands-on design & apply engineering design processes in real-world settings.** In the fall 2016 semester, the ASU freshmen in lecturer Haolin Zhu's class experienced a first when Autodesk® Fusion 360™ was introduced as the preferred design tool for the class.

According to Zhu, who is part of ASU's Ira A. Fulton Schools of Engineering, Fusion 360 was incorporated into the curriculum for the approximately 100 students in her three introductory engineering classes in order to advance the design visual models from 2D drawings to 3D models. Students learned the basics of Fusion 360 creating lamp designs, then progressed to teams collaborating to design systems to produce clean water for families in impoverished conditions, such as in Haiti.

Haolin explained that some of her colleagues incorporated Fusion 360 into their classes in 2015, and the experience was positively received by the students. So she decided to use the tool this fall, starting with a warm-up project creating a name tag and designing a lamp.

The name tag was a quick introduction to the program with students encouraged to 3D print their name tags. The lamp design process included all aspects of a lamp, from the base and body to the bulb and shade. Zhu said students followed tutorials to create the base and body designs that were all fairly similar, but a lot of creativity was exhibited in the shade designs using the sculpt environment.

**“One of the reasons Fusion 360 is so awesome is that it didn't take the students a lot of time to pick it up,”** Zhu said. **“They received a tutorial and were able to quickly become familiar with the basic design environment. Within a very short period of time, students were already able to create a 3D lamp design, and this definitely helped build their confidence. The models created in Fusion 360 are also very helpful for an audience of fellow students to visualize what the designs would look like and provide feedback.”**

# Real world issues regarding access to clean water addressed by first year ASU students using Autodesk Fusion 360

After Zhu's students were comfortable with Fusion 360, they used it for their major design project: modeling the design of a system targeted at a family of four living in a part of the world without access to clean water. The issue of providing access to clean water is one of the National Academy of Engineering's 14 Grand Challenges for Engineering. The ASU student designs ranged from water filtration devices to rainwater collection and filtration systems, as well as small-scale desalination plants.



Lamp design render by Arizona State University  
Introduction to Engineering student

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**“The purpose of this introductory class is not only to learn engineering design processes and basics, but also to learn how to apply their knowledge and skills to help in the real world. It’s about the impact.”**  
Zhu said.

Aside from developing the designs, students also experienced an enhanced level of collaboration and teamwork utilizing Fusion 360. In previous semesters, students created hand drawings, and when working in teams, one person would normally dominate the project. However, the collaborative features in Fusion 360 enhanced the team dynamics.

**“The ability to simply create and insert several separate components within one design file made creating and assembling the components of our project design easier. Having all my work saved into a cloud network was very helpful in sharing and accessing my work on another computer, as well as keeping files safe from being lost or damaged. Autodesk Fusion 360 really improved on some of the drawbacks I have experienced using other computer-aided design software,”**  
explained ASU student Jean Francois Enriquez.

Zhu, a mechanical engineer herself, added that she plans to incorporate Fusion 360 into the curriculum of some of the upper-level engineering classes she teaches, including a mechanism design and analysis class that involves designing a mechanical toy.

**“I have a great passion for engineering education, and I want students to encounter what they will experience in the real world when they graduate,”** she said. **“It’s not about lecturing and having students take notes in class. Everything is evolving, and it’s exciting for our students to be introduced to cool new technologies.”**

Autodesk grants students, educators and educational institutions free\* access to its range of software to help people imagine, design and create a better world.

Autodesk Fusion 360 proved to be an excellent tool for our project. Its simple and intuitive features and tools enabled me to get familiar with the software easily and I got straight to working on the project.

**JEAN FRANCOIS ENRIQUEZ**  
ENGINEERING STUDENT,  
ARIZONA STATE UNIVERSITY