

How to Use the Onshape College Curriculum

A Note For Instructors

Welcome! This 12-week curriculum is designed to introduce college/university students to Computer-Aided Design (CAD) using the Onshape “Full-Cloud CAD” platform. The skills learned in this material are easily transferable to any other parametric CAD system. This curriculum is made up of three main sections:

1. **Introduction and Basic Concepts (Weeks 1-5):** A medley of small projects that introduces students to the primary lessons of 3D CAD and how to use Onshape’s basic features.
2. **Bluetooth Speaker Project (Weeks 6-8):** A larger project to guide students through realistic team-based design processes.
3. **Food Processor / Mini Chopper (Weeks 9-12):** Another large project that teaches true top-down design from beginning to end with a focus on design for manufacturing (DFM) and full design documentation.

Each week, there is a lesson plan, homework, and assessment covering a number of topics. The lesson plan contains step-by-step instructions on completing specific tasks, as well as short exercises that students are expected to complete during class or at home. The homework contains longer exercises similar to the in-class exercises, and the assessments contains 5 conceptual questions about the corresponding lesson; both are designed to reinforce the topics covered in the lesson plans. The assessments provide you, the instructor, a jump-off point, where you can begin to think of additional questions as necessary.

The external folder (“Onshape College Curriculum - External”) contains two folders: “Assessment Answers” and “Onshape College Curriculum - Student Materials”. We suggest you only share the link to “[Onshape College Curriculum - Student Materials](#)” with your students. This link is reproduced below:

<https://drive.google.com/open?id=0B6dRZf2l-modX0oyMnNWTW56LTg>

A brief overview of the topics covered in each week can be found here: “[College Curriculum Outline](#).”

In addition, we have included a document called “[Public Document Links](#)” that contains links to public documents for everything that we reference in the lesson plans and homework. It might be beneficial for the students to see the final models in case they get stuck during the exercises.

With all that said, we ask you to use this college curriculum not as a strict “follow-along” set of instructions, but rather as a flexible set of educational material to aid you in teaching CAD and

design for manufacturing. Feel free to make your own copy of this Google folder and customize it in any way you wish. Re-order and manipulate the lesson plans, homeworks, and assessments to better accommodate your students.

Lastly, we always welcome and encourage any feedback you may have regarding this curriculum so that we can further improve upon it. This will be a live folder and we will constantly update it as improvement requests come in.

We hope that this curriculum will be beneficial to you and your students. We look forward to hearing what you think!

Acknowledgements:

Author:

Jim Shaw is currently the Managing Director of Fastway Engineering, a firm dedicated to helping companies get the most out of their CAD/CAE software. Using hands-on, project-based curriculum, Fastway Engineering helps Designers, Engineers, Makers, and Manufacturers climb up the learning curve as fast as possible, hence the name, Fastway. Prior to that, he's designed, analyzed, tested, built, and driven a wide range of products. www.fastwayengineering.com

Coauthors:

Aya Suzuki is a summer intern on the Onshape Marketing Team. Currently pursuing a bachelor's degree in mechanical engineering and a minor in architectural design from MIT, she first became interested in teaching when she started tutoring mathematics and physics in high school. She continued on to make educational material on design methods as an undergraduate researcher at the MIT Ideation Laboratory, and is now pursuing her own research at the MIT Newman Laboratory for Biomechanics and Human Rehabilitation.

Noa Flaherty began teaching engineering concepts in the seventh grade, when he taught robotics to elementary, middle, and high schools until going off to college, where he earned bachelor's degrees in mechanical engineering and management from MIT. He started off at Onshape as an intern on the Research and Development team and is now on Onshape's Marketing Team full time, which leads Onshape's Education and Community programs, user onboarding and engagement, marketing operations, and assists in customer success and training.