

SATURDAY ENRICHMENT SPRING 2022

3D Design and 3D Printing

Instructor: Brian Jaffe
Instructor's Email: brianj3D@uw.edu
Location: Robinson Center Classroom
Guggenheim Annex

Course Description

Learn all about the amazing world of 3D design and 3D printing! We will cover every aspect of design, from how to design your own items (using free online program TinkerCAD) to how to operate and use a 3D printer. We will also have a focus on designing for specific solutions to problems, and designing with 3D printing in mind.

Learning Outcomes

In this class you can expect to gain a knowledge of 3D design, through the program TinkerCAD, and 3D printing. By the end of the course, you will be able to not only design your own products, but design them to solve problems or to look great (and in most cases, both!) as well as how to design with 3D printing in mind. You'll have all the tools you need to keep designing and make the transition to 3D printing.

Instructional Strategies

We will have dedicated mini-projects each week that the students will have 10-15 minutes to work on. This way we will have time to both go over the subject for the day, and give the students a chance to work on their own to implement what was learned. We'll also have short, informal presentations where students can show off what they are working on to the rest of the class. In addition, the class has two 3D Printers ready to go! The students will learn how to operate and maintain the printers, as well as print things in each class.

Resources and Materials

The main resource needed is a TinkerCAD account. Ideally, please set this account up before class begins. Go to www.tinkercad.com, click "Join Now" and "Create Personal Account" and fill out the information. Once you have your own account, you have access to cloud storage and can design from anywhere! If possible, please have your student bring a laptop or tablet to class. If that isn't feasible, the Robinson Center will provide laptops to use during class. Other programs we need for the class will include Ultimaker Cura and Inkscape, but we will go over how to download those when we get to them.

Tentative Course Schedule

Date	Topics and Activities
Week 1 - April 2nd	3D Design Basics - Basics of TinkerCAD, the program we will be using for the weekly class. We'll discuss the ins and outs and capabilities of the program.
Week 2 - April 9th	3D Printing Basics - We'll discuss how 3D printers work! Not only will we discuss how printers work and the general 3D printer tool chain, we'll get hands-on with our 3D printer to show students exactly how they work!
Week 3 - April 16th	Slicing Programs - Now that we know how to design and how to print, we'll discuss the in-between program, Slicers! We'll go over how to change all the different settings for your 3D prints, as well as what effect it will have on the print, and we'll go into the importance of Chicken Feet to 3D printing! (No, really!)
Week 4 - April 23rd	In-Class Design - We will do a quick recap of everything we've learned so far and then we will do an in-class project. Everyone will be given a single prompt and will have the rest of class to design around it!
Week 5 - April 30th	Aesthetics - We know how to print, but now it's time to learn how to make those prints look great! We will discuss various post-processing methods to improve the quality of your prints, from basic sanding to Hydro-Dipping!
Week 6 - May 7th	Problem Solving - One of the keys to the world of 3D printing is solving problems. We will discuss how to look at things with an eye for solving problems and go over how 3D printing can help. And we'll learn about the IDEAL Method, a great way to keep track of your thoughts and process during designing!
Week 7 - May 14th	<p>Final Project Discussion/Office Hours - It's time to start putting together everything you've learned. This class will act less as a structured lecture and more as an open office hour to start working on your final project!</p> <p>FINAL PROJECT: TO BE ANNOUNCED!</p>
Week 8 - May 21st	Final Presentations/The Future of 3D Printing! Show us what you've been working on, its capabilities, and the solutions you came up with! Each student will have a few minutes to present to the class what they created and discuss what they learned. At the very end of class, we'll take a look at a few videos showing off the future of 3D printing!