

ENGR11A: WEEK 3 PROJECT

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PROJECT GOALS

Design on Spec for Fittage and Function for an electronics prototype

Work in pairs to build your soldering kits, then measure them to design and 3D print an enclosure. Once that is done, make a 2nd enclosure using Laser cutting.

Make sure the enclosure allows access to 3 key features: to SEE the lights, allow the Microphone to HEAR, and ACCESS or change the power (AA battery).

Allow time for a least 2 iterations of each design (3dp and Laser cut) to get the fit right.

GUIDELINES

1) Pick someone you haven't worked with before to pair up with. **You will each write your own reflections on your own websites to submit this project.**

2) Solder the electronics kit together in class. You will each make 1 electronics kit, but may want to collaborate on both builds to learn how they work. Include photos of this process and a reflection on the soldering process in your write up.

3) Individually take measurements of the electronics kit using digital calipers. Record these measurements in lab notes to include in your write up.

4) Work together to build a schematic of a design plan for an enclosure using 3D Printing. Compare your measurements of the alarm clock and brainstorm and draw a plan for a design for an enclosure on paper or a white board. Take a picture of your drawing to include in your write up.

5) Create a collaborative project space in Autodesk Fusion 360 that you can both work on. Make a plan for how to divide the work of drawing your design in CAD.

6) Export an STL from Fusion 360 and use Prusa Slicer or IdeaMaker Slicer to prepare it for 3D Printing. Record your slicer settings, and a screenshot and brief analysis of your 3D Print Trajectory Preview in your write up. Calibrate a 3D Printer and run your 3D Print.

8) See if the electronics kit fits on the 1st iteration- Take a picture and write an analysis of the result - you will most likely have to adjust your design a bit for tolerances to get a good fit. Allow time for at least 2 iterations (maybe more!) - adjust and iterate on your design.

9) **After doing the above steps for 3D Printing, do a 2nd design for Laser Cutting** with your partner, Submit a reflection of the process and outcomes on your personal website.

RESOURCES

How to setup a collaborative project space in Fusion 360:
<https://www.autodesk.com/products/fusion-360/blog/how-to-set-up-collaborative-project-fusion-360/>

Fusion 360 Tutorials:
<https://productdesignonline.com/checklist-for-fusion-360-beginners/>

GRADING

Adherence to Guidelines - 30%

Class Participation - 20%

Write up Quality- 30%

Fit, Function, and Aesthetics - 20%