EC01G MCAD Model

A **group** submission to be submitted on Github Classroom & Gradescope.

**Github Classroom assignment:** <https://classroom.github.com/a/itMSuqPC>

Remember to read the [ESE5160 S24 Assignment README](https://docs.google.com/document/d/1pPXQByy8eTxTJ--3vO8KpTjMk5yBHF8wQXoLJ55w5a8/edit) before starting!

# Summary

In this extra credit assignment, you will use MCAD software to work in conjunction with your electronic components to build a device. You will only get this extra credit if your MCAD model is used in your final project.

For example, you could use Fusion360 to make a model, then laser cut and 3D print components to use on Demo Day. However, if you simply made the Fusion360 model without laser cutting or 3D printing or some other mechanical development, you would not receive any credit!

# 1. MCAD Model

If you’re up for a challenge, start work on an MCAD modeled PCBA casework and/or mechanical extension of your electronics that is useful for your final project. The extra credit points awarded will scale based on how impressive the work is.

You can use any MCAD software, though SolidWorks is installed on lab computers at UPenn.

Considerations:

* The MCAD model has mounting or capture points to hold your PCBA in place.
* There are openings for sensors, actuators, and connectors, as needed.
* Clearances between the casework and PCBA are taken into account.
* If 3D printed, it has been submitted for printing. If using Garage Lab for build, a work permit has been submitted for approval. If laser cutting, try to get the casework cut.

Resources:

* Read [this article](https://www.hubs.com/knowledge-base/enclosure-design-3d-printing-step-step-guide/) from HUBS (about 3-5 minutes) on designing successful enclosures
* Altium’s [MCAD Co-designer](https://www.altium.com/documentation/altium-codesigner/ecad-mcad-codesign-how-to-videos) is powerful software - consider using it with SolidWorks for this assignment.
  + You can easily make casework changes based on the PCBA model.
* The Detkin Lab, Rapid Prototyping Lab, and GM Lab have fasteners (screws, nuts, bolts, standoffs, etc). Please use these to build your caseworks successfully.

**Submission:**

* Commit your MCAD model to the Github repository.
* Add a screenshot of your model in the digital world.
* Build a prototype of this model.
* Submit a photograph of your constructed design in the physical world.

# Rubric

While the rubric attempts to capture all assignments details, points assigned may vary based on submission quality and teaching team review. Please ensure you read the assignment carefully so as not to miss details and lose points. Poor readability / formatting can lose you points on any assignment.

**For all questions, 0 points will be awarded if the submission is non-existent, very poorly done, or doesn’t compile (for firmware assignments).**

| **Max Points** | **Question** | **How to achieve full credit** |
| --- | --- | --- |
| 15 | 1. MCAD Model | Build an MCAD model for your electronics project. |
| 15 |  | Total Achievable Points |