

LAB 8: PROJECT LAB

Objectives

In this lab you will use your Arduino in a project of your choosing, applying your sensing, interface circuit, and programming skills to do something that you find interesting. Be creative, have fun!

LAB INSTRUCTIONS – DONE ON YOUR OWN TIME, DEMONSTRATED IN YOUR SECTION

A. Project Ideas

You may help each other with the lab, but your ideas, circuit, and code must represent your own work. You may use snippets of code found online, but you must give proper attribution (as comments in the code), and this borrowed code will not contribute to your grade in any way. Your score will be lowered to zero if we find unattributed code in your sketches.

B. Time and Effort

You have only one lab session in which to demonstrate your work.

C. Project Rules

The rules are simple and leave plenty of flexibility:

1. Use the Arduino
2. Build a circuit
3. Use Processing to display data from the Arduino
4. Perform both input (sensing) and output. Output can mean actuation of a motor, control of a visual or audio output, etc.
5. You may use any hardware from your kit. You may also use other hardware (sensors, actuators) you might have access to, but this is not required.
6. Op amps will be provided upon request.

D. Code Submission

You must submit all code (Arduino and Processing) used in your lab project online through Elms/Canvas. Save your code including their containing folders as a single archive file (rar or zip format) and upload it before your lab section. In addition, print out your raw code and bring these printouts (stapled together with your name at the top) to your lab section.

IN YOUR LAB SECTION

1. Bring printouts of your Arduino and Processing code, stapled together with your name, to turn in.
2. Show up ready to demonstrate your project at the judges' table, one at a time.
3. You will have one minute to show and explain what you did, and the lab instructors will take up to two minutes to ask you questions. Practice your presentation to be succinct but comprehensive! Be prepared to discuss your hardware and code. If your project is not working when you reach the table, you will be sent to the back of the line.

C. Evaluation

You will present your work to all the teaching instructors in your lab section. Projects that do not comply with all of the project rules will not be evaluated. They will take notes (and possibly photos or video) and make initial qualitative evaluations:

not acceptable (D/F), acceptable (C), good (B), excellent (A), astonishing (extra credit)

Individual evaluations will be given for each of the following areas, which are equally weighted in defining your overall lab grade:

- (i) creativity
- (ii) technical difficulty
- (iii) uniqueness
- (iv) code quality, including use of commands and commenting

It is possible to do something astonishing using only your kit components and programming. The lab instructors will be able to share their initial evaluations with you at the end of the lab period, but these may change: the final evaluations will be determined at the end of the week, once we have seen everyone's work. Your evaluation might drop: for example uniqueness will be lowered if we see the same project multiple times.

Project Lab FAQ

How will the lab instructors grade us?

Each lab instructor will fill in a grade sheet and form an overall initial judgment, which may be revised once we have seen more projects.

Will we have access to op amps?

Yes, you may borrow op amps upon request.

Will we have access to the Nunchucks or strain gauges?

Nunchucks may be loaned out upon request, depending on the nature of the project. Strain gauges will need to be purchased on your own if you plan to use these sensors.

Are we allowed to use online tutorials online for the lab?

Yes, you may use tutorials. *If you do, you'll need to credit those sources when you present your work, and be able to explain what was theirs and what was yours.*

How strict is the processing code requirement?

You need to use Processing code in your project. The required level of sophistication will depend on your overall project.

What if I need more physical space than is available in the lab or facilities or equipment located elsewhere to demonstrate my project?

In the other location, take a video to show the lab instructors, and then demonstrate your project the best you can at the judges' table.

Are we allowed to incorporate libraries that we find online?

Yes. Be sure to mention this when you present your project, and give attribution in your main code using comments. You do not need to be intimately familiar with the internal workings of any library you use. However, you will be expected to show a full understanding of how the library is used inside of your own code.

Will my project be impressive enough?

To get a sense of how your project stacks up against other ideas, talk with your classmates to get a sense of what others are working on, and ask for feedback on your project ideas from the instructors and teaching staff at an early stage.