

# **AME 30358 – Mechatronics Lab Spring 2023**

## **Instructors**

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363 Fitzpatrick

**Office hours: Thursdays 4:30 – 5:30 pm** via Zoom! Please visit Canvas for the Zoom link and Password.

**Grader** – Jack Liu - cliu23@nd.edu

**Lab TA** – Ethan Chu - Ethan.Chu.17@nd.edu,

**Course Website:** <http://www.nd.edu/~prumbach/30358>

The course website is the primary resource for content including: the lab calendar, lab exercises, in-lab score sheets, and other resources.

**Canvas** – The Canvas page will be used for pre-lab quizzes, submission of assignments, and announcements. Be sure to check for announcements and enable email notifications, so you do not miss any important information.

## **Course Description**

This lab-based course will teach you how to design, build, test, and trouble-shoot complex mechatronic systems involving a microcontroller and various actuators and sensors.

Every Friday morning, you will come to lab and build a new mechatronic system. The lab handout will instruct you on how to operate individual components (i.e. motors, sensors, etc.). The handout will also instruct you on how to combine these components into small sub-systems. You will then be asked to design and build a larger system by combining the smaller sub-systems with minimal instruction. (This part of the lab exercise is called a “Design Challenge”.)

The majority of your grade will depend on your ability to complete the lab procedures and design challenges during lab. Specifically, you will demonstrate working components, sub-systems, and complete systems to the TA to receive points on your in-lab score sheet.

## **Course Materials**

An official AME30358 - Mechatronics Lab Notebook will be provided by the College of Engineering, free of charge.

## Grading

Final course grades will be computed according to your engagement with learning opportunities and deliverables uploaded to Canvas, as detailed below:

Assessment Name	Where to Find?	Where to Submit?	% of grade
In-Lab Score Sheets	Course website	TA fills out your score sheet in lab	55%
Lab Notebook Scores	N/A	TA signs lab notebook	15%
Pre-Lab Quizzes and Homework Assignments	Canvas	Canvas	15%
Technical Memos	Course website	Canvas	15%

**Brief Technical Memos** – For a few of the labs, students are required to turn in a series of plots and other deliverables listed at the end of the lab handout.

- Every plot, schematic, or table should have a concise and descriptive caption.
- Include 1 – 3 paragraphs describing the deliverables.
- Any theoretical curve shown on a plot must have its equation included in the paragraph (not in the caption).

**Exams** – There are no exams in this course.

**Attendance:** You *must* come to lab on Friday mornings at 9:30am. If you complete the lab or you are satisfied with your grade on the in-lab score sheet, then you do not need to attend lab on Monday mornings.

**In-Lab Score Sheets:** The majority of your grade is based on how much work you complete during the allotted lab time. This time ends at 11:30am on Mondays, per the registrar class schedule. You cannot obtain credit for work completed in lab after this time, unless you have an official excused absence note.

**Late Policy:** The due dates for the assignments will be posted on Canvas. Late tech memos are eligible for partial credit with a daily 30% deduction. Late pre-lab quizzes will not be accepted.

**Make sure your work gets counted!** All lab reports and tech memos must be saved as PDFs and submitted online via the “Assignments” tab on Canvas. To ensure you receive credit for your work, use the “Preview” button to check your submission. It is *your* responsibility to make sure it uploads correctly. Any technical difficulties must be immediately reported to Prof. Rumbach and University OIT.

## Academic Honesty

During class time, work is done on teams to build your collaboration and technical communication skills. However, your own learning is best reinforced and measured by completing deliverables individually. Use these best practices as a guideline for your work:

- Homework assignments, tech memos, lab reports, plots, schematics, and all other deliverables are to be created individually. Electronic transfer of any work between students is strictly prohibited.
- You may not copy and paste any content from the lab handout or any other student's lab report or tech memo, past or present.
- You may only use data that you measured during lab. Reporting data collected by other students will be considered plagiarism, unless properly cited or specifically approved by the lab instructor.
- The lecture portion of this course is *online*. It is *your responsibility* to check Canvas for announcements and enable email notifications. If you simply did not read an announcement, then it is dishonest to say "I didn't *get* the announcement."
- Lab deliverables and homework assignments must be submitted as PDF files to the correct portal on Canvas. **Any technical difficulties must be reported immediately to University OIT.** Intentionally corrupting files or lying about technical difficulties is considered a severe violation of the academic honor code.

## Make-up Labs

- You must email the professor within 24 hours of the missed lab to schedule a make-up. (Exceptions can be made for extreme circumstances, such as hospitalization.)
- Make-up labs will only be held after an official excused absence letter from the University is presented to the lab instructor.
- If you know you will miss lab due to a university excused absence, you must contact the lab instructor at least 4 days prior to the start of your regular lab to schedule a make-up.
- Failure to schedule and perform a make-up lab within the time frame outlined above will result in a zero for that week's deliverables and lab notebook score.

## Re-grades

If you think your assignment was graded unfairly, you may submit a re-grade request within 5 business days of the graded assignment being returned. The procedure is as follows:

1. Print out a copy of the assignment that you originally uploaded to Canvas, and attach a printed score sheet. (Do NOT alter the assignment.)
2. Do NOT annotate the copy with notes about why you think the grader was wrong. (A regrade is not a point-by-point legal rebuttal, rather it is a chance for a fresh perspective from the professor.)
3. Slide it under the door of Prof. Rumbach's office in 363 Fitzpatrick.

4. Prof. Rumbach will re-grade the newly printed assignment and post your new score to Canvas.

NOTE: If the grader simply added up points incorrectly, please email Prof. Rumbach.

## **Lab Rules**

1. Prepare for lab by reading the handout beforehand and completing the pre-lab quiz on Canvas.
2. Arrive to lab on time.
  - a. Arriving late for lab will result in a 50% deduction from the lab notebook score.
  - b. Arriving more than 20 minutes late will result in a 0 for the lab notebooks score, and the late student must perform the lab individually.
  - c. Lab time will not be extended for tardy students. Students that arrive late will forfeit points for any data left uncollected due to time constraints.
3. No cell phones in lab.

Cell phones can be distracting, which is both a safety hazard and detrimental to your learning. Phones should be put away during laboratory work.
4. No food or drink in lab.
5. Wear safety glasses, lab coats, and/or closed toed shoes when specified by the lab instructor.
6. Leave the equipment as you found it, so it can be used by the next person.
  - a. Disconnect all wires and cables.
  - b. Return resistors and capacitors to the proper bin.
  - c. Disassemble any experimental apparatus that you may have built.