# AME 40453 – Automation and Controls Lab
# Spring 2020

**Instructors**

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**Office hours: Mon. 4 – 5pm** in 363 Fitzpatrick

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**Course Website:** http://www.nd.edu/~prumbach/AME40453

**Course Description**

This course will reinforce and extend the fundamentals of automation and controls covered in AME30315 with hands-on lab experience. Students will learn how to correctly choose, design, and implement control algorithms using hardware in a laboratory setting.

**Course Materials**

- *Engineering Differential Equations* by Bill Goodwine
- Official "AME40453 – Automation and Controls Lab" notebook (**Free in lab!**)

**Grading**

- 35% Technical Memos (7 total, due Wednesday at beginning of lecture)
- 30% Pre-lab Assignments (8 total, due Friday at beginning of lab)
- 10% Lab Notebooks (11 total, checked each Friday at end of lab)
- 10% Final Project Presentation and Performance
- 10% Final Project Written Lab Report
- 5% C5 Motor Mount Build

**Lab Participation** - There will be 8 lab exercises at the beginning of the semester, followed by a four weeklong final project. Students *must* come to lab on Friday morning. The Monday morning lab is optional if you need extra time to complete the lab.

**Make-up Labs**

- Laboratory equipment is swapped out every Monday. Once the equipment is put away, it will not be taken back out for make-up labs.
- 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.
- If you have an emergency, you must contact the lab instructor as soon as possible to schedule a make-up lab.
- Make-up labs will only be scheduled after an official excused absence letter from the University is presented to the lab instructor.
- Make-up labs will only be held during regularly scheduled lab times.
- 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.

**Full Lab Reports** – Lab reports must be consistent with the templates/examples on the Resources page of the course website. Students must print the score sheet and attach it to their report.

**Brief Technical Memos** – For weeks when a full lab report is not due, 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. They should also 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). Students must print the score sheet and attach it to their deliverables.

**Exams** – There will not be any exams in this course.

## Lab Rules

1. **Leave the equipment as you found it.**
    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.
2. **Tech memos, lab reports, plots, and other deliverables are to be produced individually.**
3. **No cell phones in lab.**
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. **Read the handout before lab.**
7. **The instructor must sign your lab notebook before you leave.**
8. **Show up to lab on time.**
9. **No make-up labs unless you present the instructor with an official university excuse.**

## More Rules, Policies, and Procedures

### Phones and Laptops

Phones and laptops offer a huge distraction and can seriously handicap your learning. Therefore, phones are forbidden in lecture or lab. They should be turned off and put away. Laptops are not allowed in lecture, but you may use them in lab.

### Academic Honesty

- Lab deliverables are to be turned in the following week at the beginning of lab. Homework assignments are to be turned in at the beginning of lecture on the date they are due.
- Although data is collected in groups, lab reports, tech memos, plots, and all other deliverables are to be created individually.
- You may only use data that you measured during lab. Reporting data collected by other students will be considered plagiarism, unless properly cited and specifically approved by the lab instructor.

### Tardiness

- Assignments handed in late will receive a 30% deduction compounded daily.
- Showing up late for lab will result in a 50% deduction from the lab notebook score.
- Showing more than 20 minutes late will result in a zero for the lab notebooks score, and the late student must perform the lab individually.
- Lab instructors and TAs will not stay beyond the allotted time to make up for a student's tardiness. Tardy students will forfeit points for any data left uncollected due to time constraints.

### 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 new copy of the assignment and a new score sheet.
2. Put the new copy and the original graded assignment in Prof. Rumbach's mailbox in 365 Fitzpatrick. (The original is necessary to make sure you did not change anything.)
3. Prof. Rumbach will re-grade the newly printed assignment, post your new score to Sakai, and place the re-graded assignment in the return box by the elevators.

NOTE: If the grader added up points incorrectly, please see Prof. Rumbach during office hours or at the end of lab or lecture.