

# ME 133: Introduction to Mechatronics

Department of Mechanical Engineering  
University of California, Riverside  
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- Instructor:** Jonathan Realmuto  
Assistant Professor  
Department of Mechanical Engineering  
jrealmuto@ucr.edu  
Office Hours: Tuesdays 2-3pm Bourns A325
- Teaching Assistant:** Kyungjoon Lee  
klee449@ucr.edu  
Office Hours: During Lab
- Lectures:** T/Th 12:30–1:50pm  
Skye Hall 171  
<https://ucr.zoom.us/j/5571875134>
- Labs:** Th 2:00–4:50pm  
Bourns Hall A108  
<https://ucr.zoom.us/j/98401701081>
- Website:** <https://intra.engr.ucr.edu/~jrealmuto/courses/me133-w22/>
- Book:** *Introduction of Mechatronics and Measurement Systems*  
David G. Alciatore, Michael B. Hstand

## Course Description

This course consists of a series of introductory lectures and a series of lab activities centered on major topics in mechatronics with the aim of building basic professional competence.

## Objectives

By the end of the course, you should be able to:

- Recognize and use basic electric circuits and components;
- Analyze basic analog and digital circuits;
- Understand the principles of semiconductor electronics and operational amplifiers;
- Interface electromechanical components;
- Use sensors and actuators;
- Design basic feedback controllers;
- Create Arduino scripts to solve logic and control problems;
- Interpret the frequency response of mechatronic components.

## Coursework

There will be three main components:

- I. Homework.** Assigned weekly (typically), but not graded. Although the homework is not graded students are highly encourage to complete assignments to help prepare for the Midterms/Final.

**II. Lab Reports.** Each lab activity will require the completion of a Lab Report which will be assigned weekly with one week time to complete. Lab reports must be submitted through Canvas and be organized as follows:

- (a) **Abstract.** A single paragraph summarizing the Lab Report, including a concise introduction, outline of the results, and summary of the conclusions.
- (b) **Introduction.** This section should provide context for the Lab Assignment. What are the goals of the assignment? Why is it interesting?
- (c) **Methods.** Here you should provide a detailed description of all the techniques used to generate your results. Include a detailed description of the circuits and code, including images when applicable (e.g., circuit and/or wiring diagram).
- (d) **Results and Discussion.** Present and discuss the results of the Lab Assignment, including addressing any specific questions posed in the Assignment. Include figures to support your results when necessary.
- (e) **Conclusion.** Restate the methods used, and your major findings. Contextualize your results in terms of what you've learned.

Late lab reports will be accepted with a 10% grade penalty per day.

**III. Midterms and Final.** There will be two midterms (approximately weeks 5 & 8) and a final (cumulative) designed to test your knowledge of the course material.

#### Grading

Labs:	40 %
Midterms:	30 %
Final:	30 %

#### Grading Scheme

A+	100 - 97%
A	< 97 - 94%
A-	< 94 - 90%
B+	< 90 - 87%
B	< 87 - 84%
B-	< 84 - 80%
C+	< 80 - 77%
C	< 77 - 74%
C-	< 74 - 70%
D+	< 70 - 67%
D	< 67 - 64%
D-	< 64 - 60%
F	< 60 - 0%

## Tentative schedule

Week	Topic	Chapter	Lab Assignment
1	Course overview; Basic electrical circuits	1 & 2	No Lab
2	Semiconductor electronics	3	Arduino 1
3	Operational amplifiers	5	Arduino 2
4	Boolean algebra and numbers	6	Arduino 3
5	Midterm; Digital circuits	6	Arduino 4
6	Programming microcontrollers	7	Arduino 5
7	Data acquisition circuits	8	Arduino 6
8	Midterm; System response	4	Arduino 7
9	Sensors and actuators	9 & 10	TBD
10	Control of DC motors	11	TBD