

EE 16B Spring 2018
Lab Schedule

Week of	Lab Title	Description
1/15/18	No lab	
1/22/18	Introduction to Debugging	Review of lab equipment and lab safety. Learn debugging techniques, tips, and tricks. Applications: skills needed for the rest of lab.
1/29/18	Digital to Analog Converters and Analog to Digital Converters	Build a 4-bit DAC/ADC using a resistor network and an 8-bit DAC/ADC using an IC. Learn how to convert between digital and analog signals. Applications: MP3 players, convert digital video for TVs, Music recording, signal processing
2/5/18	Mystery Circuit Assembly of Mic Boards	Reverse-engineer a mystery circuit. Learn how to determine important characteristics of filters and amplifiers using your o-scope. Begin assembly of mic PCB's for use in Color Organ and Project Applications: Skills for project, frequency response analysis.
2/12/18	Color Organ: Part I	Build a circuit that flashes LED's in response to music. Learn how to apply filters and amplifiers. Applications: Signal processing
2/19/18	No lab - academic holiday	Lab week shifts to Tuesday - Monday
2/20/18	Color Organ: Part II	
2/27/18	No lab - Midterm 1	Lab week shifts to Wednesday - Tuesday
Project: SIXT33N		
2/28/18	Mic Circuit: Part I	Build a microphone circuit that will be used to communicate with SIXT333N, including the microphone, filters, and amplifiers.
3/7/18	System Identification	Verify functionality of sensors and motors, and determine parameters of model for car.
3/14/18	Introduction to Controls: Part I	Build a car, collect open-loop data, and implement a closed-loop control scheme to make the car go straight. Learn how eigenvectors can affect the controllability of a system.
3/21/18	Introduction to Controls: Part II	
3/26 to 3/30/18	No Lab - Spring Break	
4/4/18	SVD / PCA	Implement PCA using SVD to recognize spoken commands and control SIXT33N.
4/11/18	Advanced Controls	Add to the closed-loop control scheme to make SIXT33N turn.
4/18/18	Integration	Refine the way that the different systems of SIXT33N will interact with each other. Finish the final SIXT33N robot.
4/25 - 4/27/18	Buffer days	Wednesday - Friday. Project due Friday 4/27/18
4/30/18	RRR Week	
5/7/18	Finals Week	

Purpose:

Lab provides an opportunity to apply the material learned in lecture. Building circuits with real components helps build intuition and reinforce concepts, which in turn will help with lecture and exams. Lab requires critical thinking and problem solving skills that are useful in all areas of this course. Additionally, lab requires students to work in groups, fostering teamwork and collaboration.

Lab Expectations:

- Attendance is **mandatory**. You must attend the lab section that you are enrolled in.
- Lab will begin with a short introductory presentation by the lab GSI, which will contain important lab information. It is expected that students will arrive on time and refrain from distractions (phones, computers, etc.).
- Treat the lab equipment with respect – any damaged or missing equipment will negatively impact the ability of the course as a whole to complete lab assignments in a timely fashion.
- Clean up after yourself: put away equipment (leads, extra wires, parts, etc.) in the correct locations. Failure to clean up workstations will result in a grade penalty.
- No food or drink at the lab workstations!
- Be patient – there are other students who also need help. Ask your neighbors for help too.

Grading:

Lab grades account for a total of 30% of final grades. Within lab, the breakdown is as follows:

Labs (6 total)	40%
Project	60%

Lab check offs:

Each lab will be graded on a completion. Labs must be checked off by a Lab GSI within **1 week** of assignment for full credit late labs are accepted for 50% credit. If a conflict occurs (ie: illness, interview, etc.) it is the responsibility of the student to communicate with his/her lab GSI and make necessary arrangements to complete the lab. Checkoffs can be viewed on Gradescope.

Project Grading:

In order to encourage spreading out project work throughout the semester, each week will have checkpoints that must be met in order to receive credit for that lab. Checkpoints must be checked off within **1 week** assignment for full credit late labs are accepted for 50% credit. The project breakdown is as follows:

Checkpoints (6 total)	50%
Integration/Final Demo	25%
Final Report	25%