

116C Title
Spring Quarter 2018
Physics 116C



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Physics 317

Lectures: M,W,F 12:10-1:00 PM in Rm. 140 Physics

Lab: Section 1: M 3:10-6:00 PM in Rm. 152 Roessler
Section 2: W 3:10-6:00 PM in Rm. 152 Roessler

Texts: *The Art of Electronics*, 3rd Edition, Horowitz and Hill

https://www.scipy-lectures.org/_downloads/ScipyLectures-simple.pdf

Office Hours: W 2:00-3:00 PM in 152 Roessler, and also often available during lab.

Lab Instructor: Christopher Brainerd, cbbainerd@ucdavis.edu

Midterm Exams: Two Midterm Exams, TBA

Final Exam: Monday, December 11 at 3:30 pm

Homework: There will be approximately five homework assignments.

Course Description: This course covers analog electronic devices from passive components resistors, capacitors, and inductors to active devices diodes, transistors, and operational amplifiers. It includes physical models for analog devices, circuit design and analysis, and laboratory techniques.

Course Objectives: You will gain lab experience with measurement and debugging of analog electric circuits. You will learn practical mathematical tools for analyzing or designing and tuning circuits. You will apply basic physics principles toward understanding realistic models for the response of passive and active electronic components.

Lab Safety: You should complete the online course for Electrical Safety at <http://safetyservices.ucdavis.edu/training/electrical-safety>.

Lab Reports: Before each lab, download the lab write-out, print it out, and complete the pre-lab computations. Online logs are very useful, but a hand-written logbook is still hard to beat. For this class, bring a quadrille-ruled notebook for lab notes and quick hand-written plots, which you may supplement with an online logbook if you prefer. Note that if you use an online tool, you'll still need to provide a collated paper log to your TA. Data sheets can be shared via photo-copying or online logs, but each student must maintain their own log.

Students should also bring a flash drive to transfer scope images to a laptop for preparation of lab reports. The TA will provide more information.

Tentative Course Outline:

The weekly coverage might change as it depends on the progress of the class. Most weeks we'll need to cover some additional material to prepare for the upcoming labs.

Week	Dates	Lecture	Lab
1	2,4,6 Apr	Microprocessors and Assembly	1) Intro to Arduino and Scipy
2	9,11,13 Apr		2) Arduino Digital Scope
3	16,18,20 Apr	Statistical Distributions	2) Arduino Digital Scope
4	16,18,20 Apr	Uncertainties	3) Geiger Counter
5	23,25,27 Apr	Fourier Transform	3) Geiger Counter
6	30 Apr 2,4 May	Noise	4) Fast Fourier Transform
7	7,9,11 May	Statistical Analysis	5) Johnson Noise
8	14,16,18 May		5) Johnson Noise
9	21,23,25 May		6) PID Controller
10	(28),30 May,1 Jun		No Lab
11	4,6 Jun		7) Arithmetic Logic Unit