Experimental Techniques
Winter Quarter 2019
Physics 80

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Physics 317

Lectures: M,W 11:00-11:50 PM in Rm. 285 Physics

Lab: Section 1: M 12:10-2:40 PM in Rm. 152 Roessler

Text: *The Art of Electronics*, 3rd Edition, Horowitz and Hill
Office Hours: W 2:00-3:00 PM in 152 Roessler, and also often available during lab.
Lab Instructor: Christopher Brainerd, cbbrainerd@ucdavis.edu
Quizzes: There were be occassional low-stakes single-problem quizzes during lecture. **Final Exam:** Wed, March 20 at 1:00 pm in 285 Physics
Homework: There will be approximately X homework assignments.

Course Description: This course is an introduction to experimental laboratory techniques and data analysis. Laboratory techniques include electronics circuits and optical systems and related test equipment. Data analysis based on scientific python includes statistical and systematic analysis, curve fitting, and noise.

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

Lab Reports: Most scientist employ a mixture of handwritten and digital logbooks. Quick notes and sketches about procedures, calculations, and the results of simple measurements are often most conveniently handwritten. But data collection and detailed analysis are done entirely on a computer.
You'll preform pre-lab calculations, take notes of your procedure, and record simple measurements in a handwritten logbook, which will remain in the lab to be graded periodically. Your more extensive analysis and final plots will be submitted online.

Tentative Course Outline:
This is the first time this course has been offered, so the topics and schedule may be adjusted while the course is in progress.

Week	Dates	Lecture	Lab
1	7 Jan	Scientific Python	Plotting
	9 Jan	RLC Circuits	Plotting (catch up)
2	14 Jan		DC Circuits
	16 Jan		Thevenin Equivalent Circuits
3	23 Jan		Time Varying Signals
4	28 Jan	Distributions	RC amd RL Transient Signals
	30 Jan		Passive Filters and Resonance
5	4 Feb		Histograms and Distributions
	6 Feb		Geiger Counter
6	11 Feb	The Diode	The Diode
	13 Feb	Uncertainties	Plank's Constant
7	20 Feb		The Central Limit Theorem
8	25 Feb	Analysis	Error Propagation
	27 Feb		Monte Carlo and Fitting
9	4 Mar		Speed of Light
	6 Mar		Speed of Light (catch up)
10	11 Mar		Muon Lifetime
	13 Mar		