

Physics 122: Course Outline

Fall Quarter, 2019

Website: tmurphy.physics.ucsd.edu/phys122/

Physics 122 will introduce students to a wide range of useful laboratory skills. The lab schedule focuses on the following topics, week-by-week:

1. Mechanical design and some coverage of machining practices
2. Mechanics of materials; stress and strain; flexure
3. Raspberry Pi computer; unix; Python programming; interfacing (I²C); RTD read
4. Thermal properties of materials and thermal design
5. Geometrical optics and raytracing
6. Vacuum and cryogenic systems
7. Electronics refresher: AC/DC, loads, diodes and LEDs, transistors, build your own power supply
8. Op-amps and a custom-built digital-to-analog converter (DAC)
9. Pi interface to DAC to send arbitrary waveforms (Thanksgiving week)
10. Magnetic stripe reading using Pi and interrupts to sample clock and data

Grading Scheme

- 80% on lab performance and associated reports
- 20% based on exam (Thursday, December 12, 8:00 AM; likely in Solis 111 classroom)

Reference Textbook (not used in course):

Text: *Building Scientific Apparatus*, 3th or 4th edition, by Moore, Davis, and Coplan

Class Meeting Times:

Lecture: Solis 111, TTh 9:30–10:50 AM

Lab: Mayer Hall Addition (MHA) 3544/3574, W 2:00–5:50 PM

Professor Contact and Office Hours:

Professor: Tom Murphy

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Hours: Tue 3–4 PM

Teaching Assistants:

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