

Syllabus

Contact Information

Instructor: Jim Crumley
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Office Hour: 1:00 pm MTRF days (or by appointment or just stop by)

Course Information

Lab: 12:30 – 4:30 pm W
Room: 112/11/144/319 Peter Engel Science Center
Web Sites: <http://www.physics.csbsju.edu/~jcrumley/370/>
Canvas: <https://csbsju.instructure.com/courses/16852>

Experiments

Two lab assignments and three experiments will be completed by each lab group during the semester. All groups will be doing the Rocket and Magnetopause experiments, and either the coupled pendulum, speed of sound, or torsion pendulum experiment. The experiments will be graded based on your lab notebooks. As well as recording your data and doing the necessary calculations, be sure to answer all of the questions from the lab in your notebook. The final project for this course is a formal lab report about one of your labs.

Course Schedule

Roughly half of the time there will be a lecture at 12:30 pm introducing the concepts behind a lab and tools needed for a lab. You are free to work on the experiments when you like as long turn the assignments in on time, though I recommend that you do at least some of your work during the scheduled lab periods. Note that points will be deducted for late assignments. Also, note the due dates for labs in the schedule below.

Lab Reports

Keeping a clear, complete lab notebook is an important scientific skill and much of your grade for this class will be based on your notebooks. Refer back to your Physics 191 and 200 lab manuals for a list of what must be included in your lab notebook. Note in particular, that you must include a Procedure section which fleshes out what you actually did.

Additionally, whenever you are fitting a function, you should think about what your fit results mean. Do your results make sense? Is there another fit you should try? Should (0,0) be a point in your fit? Should you force the fit line to go through 0? Along the same lines, almost every number that you report should have an uncertainty. Always think about where uncertainty comes from in a given experiment, and how you are going to propagate uncertainty in your results.

Also, note that though your partners and you are expected to work on the lab together, each partner must hand in a lab notebook for each experiment. Finally, though you should discuss your answers to the lab questions with you partner, each partner should answer the questions in their own words.

Finally, whenever you create a plot in this class, you should save an electronic version of that plot, so that you can reprint it later and/or put it in your formal lab report.

Formal Lab Report

The formal presentation piece of this course will be a formal lab report. Specific guidelines and topics will be provided later in the semester — see schedule below. Note that you should make your first draft a complete draft, so that I can give you the most helpful feedback.

Schedule

Dates	Lecture	Due
1/27	Introduction / Unix Tutorial	Pre-Survey
2/03	Rocket Lab / Mathematica Tutorial	Unix Tutorial
2/10	Magnetopause Lab	Mathematica Tutorial
2/17	Torsion Pendulum & Speed of Sound labs	—
3/03	—	1st of 3 labs
3/24	Sr. thesis topics	—
4/07	A few words on Formal Lab Reports	2nd of 3 labs
4/14	—	Draft of Formal Report
4/19	Scholarship and Creativity Day	attend Physics talks
5/05	—	3rd of 3 labs
5/12	—	Formal Report & Thesis topic & Post Survey

Grading

The grade for this class will be based 25% on the formal lab report and 75% on the lab notebooks, tutorials, pre- and post-course surveys, and senior thesis proposals.