

Physics Department, California State Polytechnic University, Pomona



Physics 142L

Section 1

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Course Description: Physics 142L is the laboratory that accompanies Physics 122, the second course of a three-quarter, algebra-based introductory sequence in physics. This quarter the primary content is thermodynamics, oscillations and waves, and optics. The laboratory exercises in this course are intended to provide 1) hands-on experience with the natural phenomena of concern in Physics 122, 2) practical experience with measurement and the analysis of uncertainties in experimental work, and 3) opportunities to develop your skill in communicating the results of experimental work in the form of laboratory reports.

Conditions of Enrollment: This course is to be taken with Physics 122.

Laboratory Manual: The Physics 142 Laboratory Manual is available at the Bronco Bookstore.

How to get help: My office hours are Mondays 3-4, Tuesdays 1:30-2:30, Wednesdays 11-12, and Thursdays 1:30-2:30. In addition, I will be in the physics tutoring center (3-206) on Thursdays from 12:30-1:30. The tutoring center will also be open (in 3-209) on Mondays from 2-4 and (in 3-206) on Thursdays from 11-12 and Fridays from 11-12 and 1-3. You are also welcome to drop by my other labs Tuesday and Wednesday mornings 8-10:30 as long as you understand that questions from those students will always take precedence. Finally, if you can't come during any of these hours, I will be *happy* to make an appointment with you for another time. For me, one of *the* most enjoyable aspects of teaching is working with students one-on-one and clearing up specific problems. *Please* come see me often.

Lab Procedures: Each week you will work on a new experiment with one or two lab partners. Although it is sometimes difficult to fully understand the lab procedures until you are in the lab with the equipment, it is important that you spend about a half hour looking over the introduction and experimental procedures in the lab manual in order to understand the purpose of the experiment and something about the procedures *before* the lab period. Otherwise you will waste very precious time trying to figure out what to do *during* the lab period. I may give occasional pre-lab quizzes at the beginning of the lab period to make sure that you are coming prepared.

I will spend some time at the beginning of each period calling your attention to features of the equipment and procedures and, often, modifying some of the specific instructions given in the manual. Then you and your lab partners will spend the rest of the period gathering data and analyzing it. In most cases you should be able to finish your analysis before leaving the lab. You may then finish writing your reports at home.

In-Lab Evaluations: A portion of your lab grade will result from my evaluation of your work in the lab. I am interested in things like (1) whether you are an active partner in the lab work, (2) how well you monitor the condition of your experimental apparatus while taking data, (3) whether you think about the reasonableness and/or perform approximate analyses of your data as you go to avoid wasting time on subsequent measurements that are clearly wrong, and, (4) *most importantly*, what you do with the extra time when you finish taking your data. This time should *always* be used to complete the analysis of your data; it is the rare case in which data analysis does not reveal errors of some sort and there is no way to fix them at home.

Reports: Spend some time reading the handout, "Format Details and Scoring Guide for Laboratory Reports," where you will find detailed information about my expectations for report format, the

criteria I will use when scoring lab reports, and the meaning of cryptic marks that I make on your reports.

Your lab reports will be scored on three elements—the report format, the data and analysis, and the summary. I will make detailed comments on only the first two reports. After that, I will expect you to know what I am looking for and will make only cryptic marks to call your attention to problem areas.

Each of you will write individual lab reports until you have produced at least three reports that are “acceptable” (scores of 2 or better on all three elements.) After that you may elect to submit single *group* reports accompanied by *individual* self-evaluations and a cover sheet signed by each member of the group indicating the group’s consensus about how much each member contributed to the final product.

REPORTS ON THE FIRST TWO LABS ARE DUE IN MY OFFICE BY 3:00 PM THE FOLLOWING FRIDAY; after that, reports are due at the beginning of the next lab period. Late reports will be accepted but will be penalized approximately 20% for each week or fraction thereof. I will not accept incomplete laboratory reports; they will be returned to you and counted as late when resubmitted. All lab reports must be submitted before noon on Monday of final’s week and physics department policy specifies that any student who fails to complete more than one experiment (including the reports) will receive an F in the course.

To be absolutely clear, the above means that YOU MUST COMPLETE REPORTS ON AT LEAST SEVEN OF THE EIGHT EXPERIMENTS. In determining the “report” portion of your lab grade, however, I will consider only your *four best* and/or *most timely* reports.

Keep your reports in a simple binder so that you will have them ready when it comes time to take the ...

Quizzes: Two quizzes—one midquarter and one at the end of the quarter—will probe the following things: (1) How well you have understood the purpose, procedure, and results of the experiments, (2) how clearly you have documented those items in your reports, (3) your ability to propagate uncertainties through calculations, (4) your ability to construct graphs from data and to determine and interpret slopes and intercepts of linear fits to the data. You will be allowed to use your lab reports during the quizzes so it is distinctly to your advantage to prepare readable and complete reports.

Makeup Labs: If you miss a lab you may make it up either by attending another lab section during the same week (with that instructor’s approval) or by attending any of the lab sessions during the makeup period at the end of the quarter. In *any* case, if the lab is not made up in one of my sections, your data pages must be signed by the lab instructor with whom you performed the lab.

Grading: Your course grade will be based on the following items:

Quality of work in the lab (15%)

Reports (60%)

Quizzes (25%)

In general, if you are moderately conscientious in lab, if your four best reports average 7 out of 10 or better, and if you score 60 to 80% on the quizzes, you should expect to earn about a B in the course. As long as you complete the required seven reports, the only way to earn less than a C is to average less than 5 out of 10 on your best four reports and score below 40% on the quizzes.

Academic Integrity: Please be aware of the statement on academic integrity in the University catalog. I operate on the assumption that all of our interactions are based on honesty and good faith. I have no desire to act as policeman, just as *you* should not have to be concerned about being treated fairly and with respect. Because our trust in each other is crucial to the effectiveness of the class, I take an uncompromising, zero-tolerance stance on the necessity for sanctions when it is violated.