

General Physics Laboratory: Electricity and Magnetism

PHYSICS 11C Laboratory – Section 5

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And by Appointment

Course Summary

Physics 11C is part of the introductory calculus-based physics sequence taken by engineering, physics, and chemistry majors. It covers the topics in electricity and magnetism.

Required Materials

Physics 11C Laboratory Manual, revised Fall 2010. Available in the first two weeks of laboratory, sold by the Society of Physics Students. \$15, cash only.

Laboratory Notebook. Grid ruled composition books are actually great for this and cost much less than the “official” laboratory notebooks sold at the bookstore.

Scientific Calculator. Bring your calculator to lab each week and know how to use it.

Modus Operandi

We will perform one experiment (possibly involving multiple parts) during each lab session and you will work in teams of no more than three and the groups will change several times during the semester. The lab schedule is attached and will also be posted on my website and at the front of the laboratory. It is my experience that the experiment is easier to perform and time is much better spent in lab if you read the procedure prior to coming to lab. To coax you into reading ahead, we will have a weekly quiz at the start of class.

As beginning scientists and engineers, it becomes very important to learn how to document the performing of experiments and keeping notes. In this class, you will record your data in lab notebooks (sometimes called lab journals). In your lab notebook, you will describe the experiment's goals and describe the experiment (diagrams can be very useful). You will also record your data and observations, and show your analysis (some experiments may require you to graph your results – this is where a grid ruled page comes in handy). Experiments may ask you to discuss or contemplate your work. Make sure you take the time to do this; questions are designed

to help you understand the material. Be sure to answer questions posed to you in the lab procedures (unless otherwise instructed) as well as any other questions that I write on the board. At the very end summarize the entire experiment, note problems that you encountered and make other useful comments.

The general outline of a single week's experiments in your notebook will be something like this (assuming multiple parts):

Goals

Part 1

Experimental Overview
Observations/Analysis
Discussion

Part 2

Experimental Overview
Observations/Analysis
Discussion

...

Summary / Problems / Comments

It is rare that one writes too much in a laboratory notebook, but very common for insufficient detail to be included. A friend once described it to me in the following way: *"I've never in my life said, 'Darn, I wish I hadn't put that in my notebook.' But many times have I had wished I added more detail when looking back later."* The laboratory notebook is your archive of information. It will be collected at the end of the semester and graded.

For each experiment, your team will write a single report for submission. The report should be a good summary of the material that ought to be in your notebooks: your experimental procedure (note: if you follow the procedure in the manual to the letter, just reference it rather than rewrite – but if you modify the procedure based on changes in equipment or instructor request, clearly describe the new procedure), your data, your calculated results, and any discussion on problems encountered. Care should be taken in presenting data in nicely organized tables/graphs. Sketches and diagrams should be carefully labeled. If you use materials from other sources other than your own work, ensure that you properly cite the work. The report must be typed and it must be signed by all team members. It is essential, and expected, that all team members actively contribute to this report. The will be graded on several criteria, as noted below. Reports are due by the start of the next lab meeting (i.e. 9AM on Monday). Late reports will be penalized 20%. Reports can be turned into me directly at the start of lab or placed in my drop box which is just outside of the lab.

Teams will be shuffled during the semester. It is important that you learn how to work effectively in a team: I don't intend to serve as a referee.

Should you miss a lab, and if you get permission by another instructor to attend his or her section (which lab instructors are under no obligation to allow), you will write the entire report by yourself. I also request that the lab instructor make a photocopy of your lab notebook and give it to me directly.

Grading

The lab is only a portion of the total grade for PHYS 11C. For details on the complete grade for the course, see the syllabi of your lecture instructor. I determine your lab grade as follows:

Weekly Labs: 60%

Your weekly labs make up 60% of your laboratory grade. They are equally weighted. The scores are based on your individual prelab quizzes and your team report. Your lowest of each will be dropped. As noted above, late reports will be penalized 20%.

Prelab: 3 points

All quizzes will be due at the same time. If you are late, you get no extra time. If you miss the quiz, you will not have any opportunity to make it up.

Report: 10 points

Your laboratory reports will be scored in several areas. The available points are:

- 3 Points – Performing experiment
 - Penalties for unsafe, inefficient, & incomplete work
- 3 Points – Analysis
 - Did you do what you were asked? Did you do it right?
- 2 Points – Writing
 - Are work and results clearly explained?
- 2 Points – Presentation of results
 - Quality of figures/graphs/tables

I will provide one score sheet with comments for each team. If you miss class, your name should not be included on the report.

Laboratory Notebook: 15%

At the end of the semester, you will turn in your laboratory notebook. They will be graded on a 10 point scale. Your notebook should be easy to read and have sufficient detail to allow you to recreate your experiment at a later

time. Continuous improvement in the quality of the notebook is something to strive for, and is something I look for. I will take note of people who are not using notebooks to record data.

Lab Instructor Evaluation: 5%

You will also be graded on your laboratory skills based on my observations of you during the semester. Issues I consider in assigning this grade are your hands-on skills, your skills at working with a lab partner, and the quality of the discussions you have with your partners and me.

Laboratory Practical: 20%

In the last week of the semester (before finals), you will be given a laboratory practical to test your skills. The practical will be performed individually and without notes. It will emphasize the basic skills that you should have learned in the course of the semester.

Since there are several laboratory instructors, your lecture instructor may normalize laboratory grades to compensate for differences in grading systems. Although I am the Department Chair, I play no role in determining the grading policies for the individual lecturers and fully support their right to establish a system that they see fit.

Academic Dishonesty Statement

The Department of Physics and Astronomy has unanimously approved the following statement:

“The faculty of the Department of Physics and Astronomy will not tolerate academic dishonesty. Falsification of data, copying, unauthorized collaboration, plagiarism, alteration of graded materials, or other actions (as described in, but not necessarily limited to the Sacramento State Policy Manual) will be promptly reported to the Office of Student Affairs. The offending student will be penalized on the assignment in question. Serious infractions will result in course failure and a recommendation for administrative sanctions.”

If you have any questions regarding this statement, please come and speak with me about it.

Additional Information

If you have a disability and require accommodations, you need to provide disability documentation to SSWD, Lassen Hall 1008, 916-278-6955. Please discuss your accommodation needs with me after class or during my office hours early in the semester.

Physics 11C Laboratory Schedule of Experiments

Spring 2014

Week Starting	Experiment
1/27	Syllabus / Orientation
2/3	Electrostatics
2/10	Field Mapping
2/17	Electron Beams and the CRT
2/24	DC Measurements I
3/3	DC Measurements II
3/10	Oscilloscope Tutorial
3/17	RC Circuits*
3/24	Spring Break – No Lab
3/31	Chavez Day – No Lab
4/7	Earth's Magnetic Field
4/14	Changing Magnetic Field
4/21	AC Circuits I
4/28	AC Circuits II
5/5	Op Amps
5/12	Practical Exam

* This lab will be due in my dropbox by noon on 4/1.