

PHYSICS 11C Laboratory Fall 2012

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COURSE SUMMARY Physics 11C is the third semester of the calculus-based general physics sequence, covering electricity and magnetism, and this is the laboratory component for that course.

REQUIRED MATERIALS (i) *Physics 11C Laboratory Manual, revised Spring 2012*. Available in the first two weeks of laboratory, sold by the Society of Physics Students, \$15, cash only. (ii) *Laboratory Notebook*. Grid ruled composition books are actually great for this purpose and cost much less than the "official" laboratory notebooks sold at the bookstore. (iii) *Scientific Calculator*. Bring your calculator to lab each week and know how to use it.

MODUS OPERANDI We will perform one experiment (often involving multiple parts) during each lab session and you will work in teams of no more than three. The lab schedule is attached. It will also be posted on my website and at the front of the laboratory. 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 that end, I require each of you, **individually**, to write a one-paragraph summary called "pre-lab," summarizing the purpose, concepts, and main tasks of the experiment, to be handed in at the beginning of class. Also, as beginning scientists and engineers, it is very important for you to learn how to document the experiments and keep notes. In this class, you will record your data in your individual lab notebooks. In your lab notebook, you will describe the experiment's goals and describe the experiment; diagrams and sketches are very useful for this purpose. You will also record your data and observations, and show your analysis, including graphs – this is where a grid-ruled page comes in handy. Instructions in the manual or the instructor may ask you to discuss, contemplate your work, or answer certain questions. Be sure to follow those instructions and answer the questions posed. At the very end summarize the entire experiment, note problems that you may have encountered, and add any other relevant comments.

The general outline of a single week's experiments in your notebook will be something like this:

- Summary of Objectives
- Part 1 (Experimental Overview, Observations/Analysis/Discussion)
- Part 2 (Experimental Overview, Observations/Analysis/Discussion)
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- Summary; Problems; Concluding remarks

One usually errs on the side of writing too little in a laboratory notebook, leaving out details that turn out to be important. The laboratory notebook is your archive of information, and you should make every effort to include all relevant details in a well-organized manner. **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 and should include: (i) your experimental procedure (if you follow the procedure in the manual, just reference it rather than rewrite, but do include any modifications based on changes in equipment or instructor request), (ii) your data, (iii) your calculated results, graphs, and any discussion on problems encountered. Care should be taken in presenting data in nicely organized tables and graphs. Sketches should be carefully labeled. This **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. They will be graded on several criteria, as noted below. **Reports are due by 12 Noon on Friday following the lab in my drop box near room 238 in Sequoia Hall** (for the 11/19 week, reports are due on the following Monday at 4 PM).

Teams will be shuffled during the semester. It is important that you learn how to work effectively and get along in a team. 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 give), you will write the entire report by yourself.

GRADING The lab is only a portion of the total grade. **For details on the complete grade for the course, see the syllabi of your lecture. Your lab grade is determined as follows:**

• **65% for Weekly Labs.** Your weekly labs make up most of your laboratory grade, weighted equally. The scores are based on your individual pre-labs and your team report. Your lowest of each will be dropped. Late pre-labs will not be accepted. Late reports will be penalized 4 points if received after the due date and 6 points if after the start of the next lab meeting. Here is the breakdown:

- **Pre-lab: 2 points** (2 points for a thorough study of the procedure, 1 point for a less than thorough study or if it arrives late, 0 points for no pre-lab)

- **Report: 14 points** (Your laboratory reports will be scored in several areas. The available points are:
 - 3 Points – Performing experiment; penalties for unsafe, inefficient, & incomplete work.
 - 6 Points – Analysis; Did you do what you were asked? Did you do it right?
 - 3 Points – Writing well; Are your work and results clearly explained?
 - 2 Points – Quality of presentation; Quality of figures/graphs/tables, and overall impact

Each report will receive a score, often with comments. **If you miss class, your name should not be included on the report.** The report must be based on the work done by the team earlier in the week.

• **15% for Laboratory Notebook** At the end of the semester, you will turn in your laboratory notebook. It 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 will be considered in grading it.

• **20% for Laboratory Practical** 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 grading differences among lab instructors.

ACADEMIC DISHONESTY 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.”

Physics 11C Laboratory Schedule of Experiments **Fall 2012**

Week starting on	Experiment
8/27	Syllabus / Orientation
9/3 Labor Day Week	No lab session held
9/10	Electrostatics
9/17	Field Mapping
9/24	Electron Beams and the CRT
10/1	DC Measurements I
10/8	DC Measurements II
10/15	Oscilloscope Tutorial
10/22	RC Circuits
10/29	Earth’s Magnetic Field
11/5	Changing Magnetic Field
11/12 Veteran’s Day Week	No lab session held
11/19	AC Circuits I
11/26	AC Circuits II
12/3	Practical Exam
12/10 Finals Week	

Additions to, or modifications of, the information in this syllabus may be necessary and will be communicated in class or otherwise as appropriate.