Physics 132—Physics IIa: Electricity and Magnetism LAB
Section 1L, M 1:00–4:00 p.m.
Course Description, Fall 2005

Instructor: Andrew Dougherty
Office: HSC 022 610-330-5212
Lab: HSC 019 610-330-5212
E-mail: doughera@lafayette.edu
Web Page: http://www.lafayette.edu/~doughera/phys132/

Office Hours: I prefer to handle questions whenever they arise rather than
only at fixed office hours. Please feel free to e-mail, call or stop by at any
time and ask a question or set up an appointment. I will usually be either
in my office or lab during the free times indicated on my schedule.

Classes on Snow Days and Other Emergencies: If I am unable to
make it to class, I will leave a message on my voice mail (610-330-5212).

Description: This lab is designed to accompany the Phys 132 lecture class.
We will perform experiments to examine some of the basic principles and
ideas in electricity and magnetism. A number of experiments will deal with
electrical circuits, since they are such an important class of applications.

Text: You should purchase the Physics 132 Laboratory Manual 2005 in the
bookstore.
Each lab team will also be required to keep a bound laboratory notebook
(not a loose-leaf binder) for recording your work. I don’t require a specific
type of notebook, but you must use one that is sturdy enough that the
pages don’t fall out. During the semester, you will often have to refer back
to previous experiments to review how to do certain tasks.

Goals: The primary goals of this lab are to enhance your understanding of
the basic physics we will study in the lecture and to introduce you to the
process of doing physics. In addition, I hope to help you learn a number of
general principles and ideas that apply in many laboratory situations, such
as how to determine for yourself what techniques and procedures to follow
to explore a particular phenomenon, how to estimate the origin, magnitude,
and importance of uncertainties in your results, and how to judge whether
or not to believe the results.

Attendance: You are responsible for completing all of the assigned exper-
iments at the scheduled times. Make-up labs are not normally available for
unexcused absences. If you can not make it to your scheduled lab, please
try to come to one of the other sections for this course. You can’t count on
the equipment being available outside the scheduled times.

General Strategy:

Come to lab prepared. Students who read the lab manual before coming
to lab are more likely to learn something from it, and much more likely
to complete the lab quickly and correctly.

Ask questions. Even after you read the lab carefully, you will likely have
questions. You should not expect to understand everything entirely
on your own—knowing when to ask a question is also an important
skill.

Don’t give up easily. Most experiments are designed to work reasonably
well. If your experiment is apparently not working, consult with your
instructor.

Conduct of Labs: Lab should be an informal learning experience. Feel
free to ask questions of me and your fellow students. Remember, however,
that the purpose of the lab is to learn, so you should not simply copy what
someone else does. Instead, you should make sure you understand what you
need to do. Also, if you do consult anyone (besides your instructor), be sure
to acknowledge that in your lab notebook.

Academic Honesty: Please consult the departmental policy on academic
honesty. You should have received a copy with the lecture course description.

Grades: Students will typically work together in teams of two. Each team
will submit a single notebook that is your joint best effort. Your grade for
the laboratory will be the average of the grades for the individual labs in
your notebook.
The basic guidelines for lab notebooks are described in the introduction to
the lab manual. Here is how they specifically will apply in this section.
Grades are based on a scale of 0 to 100. A lab write-up that presents
complete data, correct analysis, and barely adequate discussion will receive a
grade of 80. The grade could go up or down from there. Points will be added
for exemplary work and further evidence that you have fully understood
what the lab was about. Points will be subtracted for mistakes, omissions,
contradictions, or sloppy work. Typically, the average grade for all the labs
is about 85.
Specifically, you will be rewarded for:
1. Evidence that you have identified and understood the key physical concepts involved in the experiment.

2. Quality of data taken—within the limits of the apparatus, this reflects the care with which you performed the experiment.

3. Extraordinarily good organization and clarity. Putting data **IN TABLES** often greatly enhances clarity and reduces the amount of writing you have to do.

4. Good discussion of sources of error, **especially** estimates of the size and relative importance of the error. Note: by “error” I mean unavoidable errors inherent in the design of the experiment, not mistakes. **If you think you have made a mistake, redo the measurement.**

5. Suggestions for improving the experiment, such as suggestions to clarify the physics, improve the precision, or improve the write-up.

You will lose points for:

1. Missing or contradictory data.

2. Incomplete, unclear, or incorrect analysis.

3. Illegibility. Your notes are of no use if no one else can read or understand them. In some cases, I may return the lab notebook ungraded and require you to re-write it more clearly before I will grade it.

4. Poor writing. While I don’t expect a polished final product, I do expect your writing to be in reasonably clear and correct English.

5. Any clear evidence that you do not understand what you have done in the lab.

If you have any questions or complaints about grading, please ask me. I will be happy to discuss your grade and how it is determined.
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