

SYLLABUS FOR PHY-132: University Physics II Laboratory

SECOND SUMMER SESSION, 2014

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OFFICE HOURS: Daily (except for PHY131 test days) from 11:40-12:40  
in the Help-Study Room PSF-186

I. INTRODUCTION

PHY-132 is the 1-credit laboratory course accompanying PHY-131, University Physics II, which covers the subject of Electricity and Magnetism. PHY-131 must be taken at the same time as (or either before) PHY-132.

For logistical and economical reasons the material covered in the two courses is not coordinated in time. The expectation is that, over the course of the term, material learned in one course will enhance the understanding of the material received in the other.

The manual for this laboratory is online at

<http://www.public.asu.edu/~gbadams/sum14/132syll.html>

You are responsible for downloading these pages, reading them beforehand, and bringing them with you to the appropriate lab. DO NOT PRINT OUT YOUR LABS ON THE PRINTERS IN THE LAB ROOMS. These files are in pdf format.

II. COURSE FORMAT AND POLICIES

A. Schedule

The course during this Summer Session commences on Wednesday, July 2 and concludes on Friday, Aug. 8. There are no Monday sessions. A schedule of experiments and meeting dates is distributed with this Syllabus. Laboratory Sessions are scheduled on Tuesday - Friday from 12:10 PM until 2:00 PM or from 2:10 PM until 4:00 PM. IMPORTANT NOTE: NO FOOD OR DRINK IS ALLOWED IN THE PHYSICS LAB ROOMS.

Help-Study sessions are for the students' benefit in gaining assistance with the conceptual basis of an experiment. The Help-Study Hall (PSF-186) will be staffed by the Instructor and recitation Teaching Assistants from 10:40 to 2:40 each day except on PHY-131 examination days (July 14 and 23, Aug. 1 and 12).

## B. Laboratory and Grading Policy

There are ten experiments scheduled for the term. Nine experiments will be graded; the first experiment, Introduction to the Oscilloscope, will not be graded. In order to obtain a passing grade (C or better), a student must have completed seven of the graded experiments. An A grade requires completion of all nine with a least a grade of 70 in each lab.

The laboratory format is based on cooperative learning. Students will work together in teams of three or four. Teams will be organized by the section TA at the beginning of each set of three experiments; thus, during the term each student will have three sets of teammates. All team members are expected to participate in all aspects of the experiment and to understand each function thoroughly, as well as the physical basis of the experiment and the conclusions drawn from the data.

Your personal grade for each lab will consist of three parts: (1) the team write-up of the lab, 65 points, (2) the team performance on the lab interview, 30 points, and (3) your personal performance at the lab interview, 5 points. Part 1, the team write-up of the lab, will consist of the data, the analysis, and the conclusions, which must be prepared prior to the interview in an acceptable format (see below under **Presentation of Results**). This team write-up must be presented at the beginning of the team interview; if your conclusions are not reasonable, your team may be sent back to your lab table to reconsider the lab analysis.

During the team interview, Part 2 of your personal grade, each team member will be asked one or two questions. Questions are asked to the individual team member, not to the team as a whole, and each individual must answer **ALONE** without prompting from other members of the team; so, no matter how you decide to divide up the tasks of the lab among your team members, it is the responsibility of the team to make sure that every team member knows all the relevant points of the lab before the interview begins. Part 3 of your personal grade (5%), depends on your individual performance on your question (or two questions) during the interview.

Roughly, in the interview and on the team write-up, major issues or questions are worth 10 points and secondary or smaller issues are worth 5 points. For example, in 132, error propagation issues are usually worth no more than 5 points. On the other hand, after having done the lab on Electric Potential and Electric Field, an inability to describe the major properties of

electric fields would cost a team at least 10 points. Similarly, in the team write-up, failing to properly label axes on graphs might cost only 5 points or less; while an incorrect calculation of a critical value would cost at least 10 points.

Your final lab grade will be the average of your nine personal lab grades with:

$$A \geq 90 \quad B = 80 - 89.9 \quad C = 70 - 79.9 \quad D = 60 - 69.9 \quad E < 60$$

The plus-minus grade scale will be used; but the plus-minus cutoffs will depend on the final distribution of grades (for example 87.6-89.9 would be a typical range for B<sup>+</sup>). An *A* also requires completion of all nine graded labs (70 or better). A final grade of *B* also requires completion of at least eight of the graded labs (70 or better). Completion of less than seven of the graded labs is an automatic *E*.

### C. Data Recording

Data are to be recorded **in ink** on  $8\frac{1}{2} \times 11$  quadrille sheets ( $5 \times 5$ ) (please share the cost of paper). These are to be no erasures or "white-outs". Errors are to be lined out. At the end of each laboratory period or the conclusion of the experiment, each data sheet is to be dated and initialed by all team members and section TA. Data should be recorded in tabular form with well-labeled columns, or otherwise distinctly entered onto the data sheet. The data may be transferred to computer spread-sheets, etc., for analysis if the team so desires. For your own protection, you may wish to make at least one photocopy of all signed data sheets (it is certainly a bad idea to have only one copy of your data).

### D. Presentation of Results

Under the interview structure and in light of the summer's compact schedule, no individual formal written lab reports are required. However, the data are to be analyzed, with full attention to experimental and statistical uncertainties (except when explicitly excused) and the results are to be presented in tabular and/or graphical format as appropriate. There must be a clearly written description of the analysis process complete with pertinent equations. If your calculations are done with a spreadsheet, or with Graphical Analysis, you must show one example of each calculation in your written analysis. **BE SURE TO STATE YOUR CONCLUSIONS PROMINENTLY AND CLEARLY.** It is

expected that most reports will be handwritten on engineering paper, but word-processed reports are acceptable. All these documents, as well as the original raw data sheets (initialed and dated), are to be presented at the interview.

#### **E. Scheduling of Interviews**

Most interviews will occur during the last hour or so of the second day on which the particular experiment is scheduled on a first-come first-served basis. Interviews normally will last no more than ten or fifteen minutes.

#### **F. Relation to Lecture**

The Department of Physics cannot afford to stock sufficient equipment to allow all students to conduct the same experiment at one time. It is thus impossible to coordinate closely the laboratory work with material covered in the PHY-131 lecture. Consequently, some students may encounter a concept or physical principle in the lab before learning about it in lecture. This is not necessarily a bad ordering of the learning process; many prefer it. On the other hand, some students may wait for a week after learning the physics theory before doing the relevant experiments. In either case, it is expected that material encountered in each course will eventually be reinforced by material from the other course in such a way as to enhance understanding.

#### **G. Withdrawal**

Withdrawal policies are established by the University (see the 2014 ASU Calendar at <http://www.asu.edu/calendar/academic.html>.) The deadline for course withdrawal is July 22. Other deadlines are also given in the Calendar.

*Beginning July 2, this information, plus course info updates, will be available on the internet at <http://www.public.asu.edu/~gbadams>*