

PHYSICS 21900 LAB SYLLABUS

FALL 2009

Faculty:

Prof. R. Reifenberger – Room 80

Textbook:

Principles of Physics by Kinetic Books, Edition 1.3.

Lab Coordinator:

Dr. Andrzej (*Andrew*) Lewicki - Room 142, lewicki@physics.purdue.edu

Lab Manual:

Physics 21900 & 22100 Laboratory Manual, 2009/2010, Andrzej (*Andrew*) Lewicki and Jennifer Jourdan, LAD Custom Publishing, 2009.

Welcome to **Physics 21900** laboratory. This semester, you will explore the fundamental concepts of electricity and magnetism by performing experiments, collecting data and analyzing your results.

General description:

Labs meet in **Physics Building (PHYS) Room 150**. The **Lab manual** (*Physics 21900 & 22100 Laboratory Manual, 2009/2010*, Andrzej (*Andrew*) Lewicki and Jennifer Jourdan, LAD Custom Publishing, 2009) is available from local bookstores. Do not buy any previous editions of the lab manual. **Please note that both Physics 21900 and Physics 22100 courses use the same lab manual and have the same lab curriculum.**

Students who completed Physics 21900 lab during the last two years may claim the previous credit for the lab. The minimum requirement for the credit transfer is to have all experiments completed and have the number of points for the lab equal to at least 75% of the maximum.

Lab reports are usually due at the beginning of the next experiment. For the exact dates, see the **lab schedule** at the end of this syllabus.

Always bring a calculator with you to the lab. **Do NOT bring drinks or food to the lab!**

The **help center** for Physics 21900 is located in **Room 11A** of the Physics Building. The help center schedule is available at the following address:

<http://www.physics.purdue.edu/class/services/HC219221.pdf>

Additional information about the course can be found on the WWW at:

<http://www.physics.purdue.edu/phys219/>

Lab procedures:

Before coming to lab, you must answer all prelaboratory questions scheduled for that week. These questions are closely related to the activities and measurements you will do in lab. The prelaboratory questions typically require 30 minutes of effort. The prelaboratory questions are your individual work, so everyone is expected to complete them. **The prelaboratory questions must be answered on-line (except of make-ups)** using the *Computerized Homework in Physics (CHIP)*. CHIP is accessible to any computer running popular web browser software, e.g., Firefox, Safari or Internet Explorer.

All lab scores including points for prelaboratory questions (prelabs) and points for lab reports will be stored on CHIP. **The prelabs of CHIP are due before the deadlines, which are set exactly at 10 minutes before the beginning of the scheduled lab time.** For instance, if the lab is scheduled on Wednesday at 11:30 AM, the deadline for prelabs is at 11:20 AM on that day. After deadlines, CHIP would not assign any points for the prelabs (no credit for late prelabs). Physics 21900 students will be able to access their gradebooks (using CHIP) and check the latest scores. You will find more information about accessing and using CHIP on a separate handout available in the lab or from Undergrad Office in room PHYS 144.

During the two-hour laboratory period, you will observe phenomena, manipulate the lab apparatus, collect data and ask questions. Be on time for the lab. Remember to sign the lab attendance list! Your lab TA will briefly review the theory behind the experiment and describe the lab equipment to be used. **Before leaving the laboratory room, make sure that your TA has initialed your data sheets.** The minimum penalty for the lab reports without TA's initials is 2 points. TA may even refuse to accept lab reports without initials.

In the Physics 21900 lab, you will work with a lab partner. All experimental **data must be written in ink** on your data sheets. TAs have been instructed not to initial data sheets written in pencil. In all data sheets, you will find a pair of parentheses with an empty space in between them: (). You are required to write appropriate unit in that space, e.g., (Ω). Results without units are not complete!

During the week that follows each lab experiment, you and your partner will prepare a laboratory report, that includes your initialed data sheets, calculations, graphs (if required), cover sheet and the *Analysis* section. In that section, you should briefly describe the observed phenomena. You should also explain how the results were calculated from the raw

data and what are the most important results of your experiments. Discuss sources of experimental error and their relative influence on your results. The lab report typically requires 1-2 hours of effort. The requirements for each lab report are clearly listed in the laboratory manual.

Group lab reports are allowed (but not required) this semester. It means that only one lab report for you and your partner is required. Obviously, the same credit will be assigned to lab partners. **However, if a lab report is not ready on time, the penalty will apply to both students, regardless of who caused the delay.** Remember to attach to your group lab report **separate cover sheets for all lab partners.** The cover sheets are located at the end of the lab manual. If you prefer to submit individual lab reports, you are always allowed to do that. Just tell your lab TA about your decision. The prelaboratory questions must be completed and submitted **individually.** The attendance will be taken at each experiment. Please, make sure to **put your signature on the attendance list.**

The lab reports from the lab make-ups must be submitted as individual reports (no group lab reports for make-ups).

Grading practice:

Each lab is worth up to 14 points (including prelabs). Therefore, the maximum number of points for the lab portion of Physics 21900 course is equal to: $11 \text{ labs} * 14 = 154$ points. **Since the lab contribution to the total grade is 150 points, the final score will be multiplied by 0.974 to get 150 points ($154 * 0.974 = 150$).**

Since the grading level may slightly vary between TAs, **it is possible that the final lab grade will be normalized** to have the same average grade for all laboratory TAs. Lab points are not converted into A, B, C, ... grades. At the end of the semester, the sum of your points earned for Physics 21900 (lab + recitations + exams) will be converted into one final letter grade.

If you have missed an experiment for a **valid reason** (e.g., illness):

- Give a written documentation to your lab TA during the next lab or bring it to his office and ask permission to make-up the missed lab.
- If you have not turned in the report from the previous lab, turn it in during the first day after your absence to the drop slot located below mailboxes between rooms PHYS 146 and PHYS 150 (make sure that your lab TA's name is written clearly on the cover page of your lab report).
- Prelabs for the make-up labs must be submitted on paper during the make-up session (CHIP is not set up to handle make-ups).

- Your TA will set the due dates for make-up lab reports.
- If you have more questions about make-ups, please ask the lab coordinator.

Subtracting 1 point per school day will penalize late lab reports. Even if your lab report is very late, (i.e., zero points for the lab report due to the penalty) you would receive points for the prelaboratory questions and the lab would be recorded as completed.

Students are not allowed to make up late lab reports or to make up more than one experiment during the scheduled lab make-up time. Re-doing labs is not possible. Make-ups are only for those who missed labs for a legitimate reason and got TA's permission to make-up labs. Prelabs for the make-up labs must be submitted on paper (CHIP is not set up to handle make-ups).

You may not copy answers, lab reports, use "files", or allow your answers to be copied, by any other students (except of your lab partner). Any violation of the above standards will subject the offender to penalties allowed by the Purdue University. If you wonder whether a course of action violates this policy, simply ask in advance. Any attempt to forge data (e.g., copying data from previous semesters or from other students) or to forge your TA's initials will be penalized!

In a case of a long illness, (e.g., two or more weeks in a hospital) you need to get permission from the lab coordinator or the faculty in charge of the Physics 21900 course to make up the missed labs.

If you have any questions concerning the lab policies, please ask the lab coordinator. **Keep all graded lab reports** until the end of semester.

After 5:00 PM on December 14, 2009 we will not accept any lab reports (no exceptions)!

Physics 21900 Laboratory - Fall 2009

DATE	ROOM 150	REQUIRED
8/25-26	Introduction and Review of Vectors	
9/1-2	E1 – Coulomb’s Law	E1 Prelaboratory Questions
9/8-9	E2 – Electric Field Mapping	E1 Lab Report E2 Prelaboratory Questions
9/15-16	E3 - Ohm's Law and Resistance	E2 Lab Report and E3 Prelaboratory Questions
9/22-23	E4 - Direct Current (DC) Circuits	E3 Lab Report and E4 Prelaboratory Questions
9/29-30	E5 - Magnetic Field	E4 Lab Report and E5 Prelaboratory Questions
10/6-7	Lab make-up for experiments: E1 – E5	
10/13-14	October Break Week (No lab)	
10/20-21	E6 - Electromagnetic Induction	E5 Lab Report and E6 Prelaboratory Questions
10/27-28	E7 – Alternating Current (AC) Circuits	E6 Lab Report E7 Prelaboratory Questions
11/3-4	E8 - Optical Ray Tracing	E7 Lab Report and E8 Prelaboratory Questions
11/10-11	E9 – Lenses	E8 Lab Report E9 Prelaboratory Questions
11/17-18	E10 - Diffraction Grating	E9 Lab Report E10 Prelaboratory Questions
11/24-25	Thanksgiving Vacation (No lab)	
12/1-2	E11 - Photoelectric Effect	E10 Lab Report E11 Prelaboratory Questions
12/8-9	Lab make-up for experiments: E6 - E11	E11 Lab Report

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