

# SYLLABUS

## PHYSICS 276 - Fall 2008

**INSTRUCTOR :** Richard Ellis

Room 1202K Energy Research Bldg

[rfellis@umd.edu](mailto:rfellis@umd.edu), Phone : 57369

Office Hours : TBA

**TEXTS:** *Physics 276 Laboratory Manual*

*An Introduction to Error Analysis* by J.R. Taylor

**CLASS TIME and PLACE:** Room 3120 Sect 0301 Thu 2 – 6 pm

### COURSE DESCRIPTION:

Physics 276 is a two credit laboratory course for the physics major sequence dealing with electricity and magnetism and electric circuits. The prerequisites are PHYS 272 and 275 and the associated mathematics courses. Students will conduct seven experiments during the semester (one requires two weeks) and write up lab reports for each. Some class sessions will also include discussion and analysis of previous and upcoming experiments as well as lectures on the basic material.

### REQUIREMENTS:

1. Students are required to do ALL the experiments and complete a lab report for each. Failure to do this will result in a failing grade in the course.
2. Lab reports are due by the day of the next week's class, i.e., one week after performing the experiment (two weeks over Spring Break). Reports are to be submitted online through **Blackboard**. For each day late the lab report will automatically lose **10% of the maximum points per day**. Please see me about extensions in the case of sickness, etc. **For this purpose a day ends at midnight. However, if you must submit a late hard copy, reports are to be turned in to my office in the Energy Research Building, which is locked after 5PM.** These deadlines override those in **Blackboard**. See the Laboratory Manual and the comments in this syllabus concerning the format for lab reports.
3. Discussions: There will be a few discussion periods during the semester to review the results, etc. Students will be expected to contribute, often by giving short presentations to the class about some aspect of the experiment.
4. Final Exam: There will be a final in-lab exam at the end of the semester. The exam will deal with items directly related to the experiments and experimental techniques, including error analysis. Taking the final exam is required for passing the course.

**GRADE:** Your grade will be calculated using the following scale:

Lab Reports	75%
Final Exam	25%

## **LAB REPORTS : ADDENDUM TO LABORATORY MANUAL**

- a. Late Report deadlines - See above #2
- b. Lab Reports (Pages 2-3)

Please be brief in sections A, B, and C and do not repeat details provided in the lab manual. In the interest of keeping the workload down you do not have to do an introduction or equipment and procedure section in your report. However, any procedure that is not obvious must be included in the relevant section on data, results, etc. Keep anything that is already described in the Lab Manual to a minimum. The sections on data, results, etc should be very similar to earlier labs and should be in complete sentences, not shorthand. The assumption here is the report is being read by someone familiar with the setup, etc, but we do not want to guess what you did. For example, you must include any equations you are comparing your data to. Your report will be graded primarily on sections D - G. Neatness, organization, clarity of presentation is important in a lab report. Lab Reports will be graded on a scale of 100.

- c. Analysis, fitting, etc.

You may use any computer package you choose to plot and fit your data. Whatever you use must be capable of producing plots with axes labeled, error bars, legends, etc. EXCEL is recommended and is installed on the computers in the lab and WAM rooms. We will provide least square fitting routines in EXCEL for this course. In addition, students might want to experiment with fitting methods outside the ones we provide.

## **COMMUNICATION :**

We will be using the web based course software **Blackboard**, which is how you will submit your lab reports and look for announcements, updates, etc. You should already be in the system. Sign on immediately to check it out. Announcements will also be made in class and by email but **you must attend class to guarantee you receive all relevant information. It is important that you be sure to know if there are any differences between my sections and Sects 0101 and 0201.**

## General Laboratory Rules

1. Students may work in pairs but each student must keep his own data sheet, do his own analysis, and do his own report. It is ok to work together and discuss your results.
2. A lab notebook is **REQUIRED**. Be neat and clear. You must keep this to verify that you were indeed there and took data. Before leaving lab upload your work to somewhere you can access and email them to yourself. Taking a hardcopy with you is also not a bad idea.
3. In general, you should do as much analysis in lab as possible. Before leaving lab have the instructor or TA initial your data sheet and required plots and analysis. At the beginning of each lab we will let you know what is required to be completed before leaving.
4. An addendum to the lab manual for each experiment will be provided on **Blackboard** and/or handed out in lab. Some modifications will be discussed at the beginning of lab. It is essential to read the lab manual and addendum before class.
5. Lab reports are to be submitted online thru **Blackboard**. See above for deadlines. If **Blackboard** submission fails for any reason email me and the TA the report. A hardcopy delivered to me or the TA is always a last resort.

## **SCHEDULE :**

The schedule follows. If you need to attend one of the sessions you are not assigned to please let me know by email and I will see if Dr. Hill can accommodate you. This is the preferred way to make up (or pre-make up) an experiment. Also note there are two make up sessions at the end of the semester.

### **PHYSICS 276 SPRING 2008 SCHEDULE**

<b>DATE</b>	<b>ACTIVITY</b>
7-Feb	INTRODUCTION, DISCUSSION
14-Feb	EXPERIMENT I : OHM'S LAW
21-Feb	EXPERIMENT II : MAGNETIC FIELDS
28-Feb	EXPERIMENT III : ELECTRON BEAM
6-Mar	DISCUSSION, OSCILLOSCOPE EXERCISE, PSPICE
13-Mar	EXPERIMENT IV : RC AND RL CIRCUITS STEP INPUT
20-Mar	SPRING BREAK
27-Mar	EXPERIMENT V : RC CIRCUIT SINUSOIDAL INPUT
3-Apr	EXPERIMENT VIa : LRC CIRCUITS 1
10-Apr	EXPERIMENT VIb : LRC CIRCUITS 2
17-Apr	EXPERIMENT VII : DIODES AND RECTIFIER CIRCUITS
24-Apr	MAKEUP
1-May	FINAL EXAM
8-May	MAKE UP