PHYSICS 360A/360B/460A/460B –Spring 2011
INTERMEDIATE LABORATORY COURSE OUTLINE

Instructors
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Course web-site: http://uwace.uwaterloo.ca/

Text
Experiment write-ups are located in the Experiments section of the UW-ACE page. A lab notebook is required and can be purchased from UW Bookstore. “Physics Lab Notes” or any bound book of similar format will do. References for general experimental techniques, error analysis and the specific experiments are available for loan. You are also expected to consult library material as required.

Preparation
You are expected to arrive to the lab prepared to do the experiment. This includes having a copy of the experiment write-up and your lab-book. In your lab-book you must describe in 2-3 sentences what your goals are for the lab and any possible questions that you have on the procedure and/or equipment. Do NOT record results on loose-leaf paper. A restatement of the introduction or experimental procedure from the lab handout is not acceptable. If you arrive to the lab unprepared, you may be asked to leave. It is very important that you maintain a laboratory notebook with a complete record of the experiment that was performed during each session. At the beginning and end of each lab period, you should show your notebook to an instructor. They will initial the book and make a record that your notebook has been checked.

Schedule
The schedule will be posted on the course website, and on the white board outside the laboratory room, PHY 309. You should check it often for updates. The lab room; PHY 309 is open Monday afternoons from 1:30 – 5:30 pm.

Reports
You, together with a partner, must select experiments totalling 18 hours credit for each course and perform the experiments on the days that they are scheduled. The pair will work as a team to perform the experiment during the laboratory session. They will continue to work as a team on the experimental write-up and subsequently submit a single, joint report. However, in conjunction with this, we do expect students to maintain their own laboratory notebook with all the information regarding each experiment as it is performed.

If you have a partner that you know you would like to work with then please make this information known on your experiment selection sheet. Otherwise, as part of the scheduling procedure we will pair you up on each experiment where possible. All laboratory reports must be submitted no later than two weeks after the date the experiment is performed. If the report is not received during that timeframe, the mark recorded for that lab will be zero.
Experiments

The current experiments (with credit hours) are listed below. **Note that not all experiments are available each term.** You must attend an organizational meeting during the first week of the term to select a partner and choose experiments for those available. During this meeting there will also be a short tutorial given on graphing, and general expectations for your write-ups. Certain experiments have pre-requisites as indicated:

1. Speed of Light (6)  
2. Atomic Force Microscope (4)  
3. Ionization Potential (3)  
4. Thermionic Emission (4)  
5. Coupled Pendula (6)  
6. Ultrasonic Diffraction (4)  
7. Waves & Pulses in Cables (6)  
8. Frank-Hertz Experiment (4)  
9. Resistivity & Hall Effect* (4)  
10. RF elect. and Freq. Stabilization* (4)  
11. Critical Point & Equation of State (4)  
12. X-Ray Diffraction (4)  
13. Mass Spectroscopy (4)  
14. Nuclear Counting (6)  
15. Gamma Spectroscopy (4)  
16. Wave Form Analysis (4)  
17. Analogue Computer+ (6)  
18. Helium Excitation (3)  
19. Dielectric Thin Films (4)  
20. Nuclear Spin Relaxation* (6)  
22. Lattice Dynamics (4)  
23. Ellipsometry* (6)  
24. Acoustic Measurements (3)  
25. Analogue Computer+ (6)

* These experiments are considered to be slightly more advanced, and students enrolled in Phys 460A/460B must select at least one of these experiments towards their total number of hours. However, students in 360A/360B may select any or all of these experiments as well.

+ Requires the prerequisites P352 and P352L

Laboratory Test
A written test, of 90 minutes duration for each course will be held near the end of the term. It will consist of some general questions and some specifically related to the experiments completed. **Students who do not obtain a passing grade on the test, may not be eligible to pass the course.**

Grade
Final marks will be calculated as follows: Lab Reports: 75%; Lab Test: 25%.

Laboratory Evaluation
These will be completed via UWACE. You will find a link to this evaluation when you log onto your UWACE page. To access the evaluations, look for LAB EVALUATION. Once each experiment is performed, you are required to complete the evaluation for that experiment and an email confirmation will be sent to you and the Evaluator Administrator. A grade will not be recorded until the Administrator has received a confirmation. The Administrator is not involved in the course and the evaluations will remain independent from the course instructors. More instructions will be available on the evaluation page.

Please fill in these evaluations, as they will be read, and used to improve the laboratories for future students.