Instructors

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Text

Experiment write-ups are located in the Content section of the LEARN (https://learn.uwaterloo.ca) course 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 online and 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 via LEARN. You should check it periodically for updates. The lab room; PHY 309 is open Monday afternoons from 1:30 – 5:30 pm.

Reports

You, must select experiments totalling 18 hours credit for each course and perform the experiments on the days that they are scheduled. If you have a partner 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 all 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, you will be paired up for each experiment where possible. All laboratory reports must be submitted via the drop box in LEARN (pdf format only) no later than 5:30 pm 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 this term. During the organization meeting you will be given selection sheets and some brief comments on graphing and the 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. Stabil.+ *(9)  
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. Pound-Drever-Hall Frequency stabilization*, ++

* 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  ++ requires you complete #10 first.

Reports Quiz: There will be an online quiz in LEARN that all students must complete for course credit. This quiz is structured to test your understanding of the proper form for a laboratory report. It is STRONGLY advised you read over the reference material on Lab reports and complete this quiz BEFORE you begin to write up any reports.

Lab Evaluations: There will be a separate course page available to you in LEARN. It will be listed as Intermediate Physics Survey. You are to complete an evaluation for each lab you do this term. The survey is anonymous, and must be completed before we will return any marked report for that experiment.

Oral Presentations: Each student will prepare and present an oral presentation on an experiment of their choosing from the ones performed during the term. This will be a brief (~10 minute) talk followed by a question and answer period.

Grade: Final marks will be calculated as follows: Lab Reports: 75%; Presentation: 25%. The online quiz is for credit only, but you MUST complete it to obtain a final grade in the course.