

# Physics 209 - Intermediate Experimental Physics

Winter 2008/09

Hebb 30, M, Th, F 2-5pm

**Web site:** The lab manual and lots of other useful information can be found at <http://www.physics.ubc.ca/~phys209> You should check there often. The site will be updated throughout the term - final versions of the lab manual for each experiment will be posted by the Friday before.

**Pre-requisites:** Phys 108 & 109 or one of Phys 102, 153 or Science One.

**Co-requisites:** Math 215 and one of Math 200, 217 or 226.

## **Learning Goals: What is this course about?**

In this course you will learn the skills necessary to work successfully as a physicist in the laboratory. You will learn to use a variety of electronic test equipment (eg. multimeters, function generators, oscilloscopes), and using computers for data acquisition. You will become familiar with the building, debugging, and analysis of analog and digital electronic circuits. You will become familiar with the physics of a variety of simple experimental systems (which ones depends to some extent on which experiments you choose to work on). Understanding the source and propagation of uncertainty and errors plays a key role in experimental science, and skills in these areas will be developed. You will learn (by doing) to think through the entire experiment, and how to make use of the resources at hand to make the best measurements possible. Communication of results is an important aspect of any scientific endeavour, and you will gain experience in formal scientific writing.

**Tutorials:** In term one, tutorials will present material you need to know for the labs and assignments. You should come every week. In term two, the tutorials will be set up more as office hours - they will be a chance for you to get help with your analysis.

## **Marking:**

Term I: 67% of final mark

Assignments	10%
Formal Report	30%
Lab Notebook	60%

Term II: 33% of final mark

Prelab Assignments	10%
Formal Lab Report	30%
Lab notebook	60%

- Text:** None, though you'll want to keep your first year physics text handy.
- Assignments:** Occasionally. The assignments are important, do them.
- Turning stuff in:** For the first experiment, you'll turn your notebook in at the end of the lab period. Your book will be marked and returned to you for the start of the second lab. For every other experiment, you'll have a week to complete your data analysis before turning in your book at **the beginning** of the next lab period. Lab books are to be placed on the table at the front of the room. Assignments and pre-labs should be done on separate sheets of paper and turned in to the marked box in the hallway just outside the lab.
- Lab Notebook:** Your lab notebook is a very important part of the course. Your notebook should be a complete diary of what you do in the lab. It should contain enough information that a knowledgeable person could reproduce your results based solely on what you wrote in your notebook (without having the lab manual!). It should be complete and coherent enough that if you were to come back to your notebook several months (or years!) later, you would be able to understand exactly what you did in the lab. For more information and examples, see the web page. You need to write things down as you do them, in your book - not on scrap paper, and not "later."
- Formal Reports:** There will be one formal report to turn in per term. As you won't know ahead of time which experiment will be written up, you must make sure to keep a detailed account of every experiment. Information on the format and expectations for the formal report will be provided in the tutorial and through the web site.
- Deadline policy** Late homework and prelab assignments will not be accepted for marking under any circumstances. **No exceptions.** If you are not able to turn in an assignment on time for a legitimate reason (eg. illness) then if you provide evidence of your legitimate reason (eg. note from Doctor) to one of the faculty members, you will be exempted from that pre-lab or assignment if and only if you turn in the completed assignment. **Formal reports** will be accepted late, subject to a 10% per business day penalty. If you miss a lab period due to illness, please make arrangements with a TA or faculty member to complete the lab you missed and have your book marked.
- Computer Accounts:** You will need an account on **physics**. You can get this yourself by stopping by Henn 203/205 and following the instructions. You must have a campus wide login (CWL) before doing this. You will also need a print quota, which can be purchased in the main physics office (Henn 325).

**Your To-do list:**

There are several things you need to do before your first lab:

1. Get a computer account on **physics** if you don't already have one. See above.
2. Buy **two** yellow lab notebooks at the bookstore. You'll need both.
3. Put your name, student number and lab section on the front of your books. Also write them on the bottom of the book (this makes it easy to pick your book out of a large stack).
4. Go to Henn 325 and buy a print quota so you can print output from your **physics** account.
5. Download the first experiment from the web page and read it.