Physics 300B, Spring 2012

> "If it disagrees with experiment it is wrong. In that simple statement is the key to science."
>
> —Richard Feynman, *The Character of Physical Law*

Administrivia

Instructor	Dr. Eric Ayars
Office	PhSc 124
Lecture	Monday, Wednesday 11AM–noon, in PhSc 106.
Lab	Thursday 8–11AM or 11AM–2PM, in PhSc 123.
Phone	898-6967
Webpage	`http://phys.csuchico.edu/ayars/300B/`
Email	eayars@csuchico.edu

Materials

Textbook	*Modern Physics, 2nd ed.*, Randy Harris
Lab Manual	*300B Lab Manual*, sold by SPS
Lab Notebook	"Blue Collar" 80-page 5×5 quad-ruled spiral-bound 8.5"×11" notebook (or equivalent).

Course Structure

This second semester of modern physics will focus primarily on *applications* of the material covered in the first semester. Solid state physics will be one of the major components of the course, but this requires some rudimentary understanding of molecular structure and statistical physics so we'll start with those. From there, we'll move to nuclear physics and nuclear reactions. Time permitting, we could get as far as particle physics and cosmology, but that's unlikely.

Homework & Labs

There will be a homework assignment due each Monday at 5PM. Homework solutions will be posted shortly after that time, and attempts to turn in late

homework will be met with derisive laughter.[1] *Please submit your homework one problem (at most) per page.*

Each homework problem is worth three points. The first two points are given in my first pass at grading, as follows.

2: Perfect work, showing solution process, *with written explanations.*

0: Nothing there.

1: Everything between 0 and 2.

You may pick up your graded homework at my office on Tuesday at 11AM or later, the day after it is due. The third point for each problem is obtained by resubmitting the complete homework set no later than 5PM on the following Monday, with any deficiencies corrected. You may use other professors, other students, or even the posted solutions in the preparation of your resubmissions. Obviously, if you got a '2' on the first submission, the resubmission is pretty easy — do it anyway!

Lab reports —short printed summaries of your experimental work— will be due each Wednesday at 11AM. These should include an abstract, a short summary of the experimental procedure, and a description of the results with an estimate of the uncertainties involved.

Exams

We will have a pair of tri-term exams: one just before Spring Break, and another in mid-April or so. The final exam will be comprehensive, but will emphasize the later material so as to roughly equalize the exam coverage.

In addition to the lecture exams, there will be a lab practicum for this course. This will be an opportunity for you to show that you can set up and correctly use some of the basic devices and techniques common to physics lab such as oscilloscopes, curve fitting software, benchtop meters, computers, error analysis and propagation, and other devices and techniques from the lab. This practicum must be individually scheduled with Dr. Ayars at some time after spring break, and should take no more than one hour.[2] It will be graded pass/fail. Should you fail, you will be allowed a second attempt; but passing the lab practicum is a requirement for passing the course. You may use your lab notebook on the practicum.

[1] I really don't do derisive laughter all that well, and have better things to do than learn it, so please plan ahead.

[2] It could take *much* less...

The final grade will be weighted 40% on exams, 30% on homework, 30% on lab, and then multiplied by either 1 or 0 depending on your lab practicum.

Group work

I highly encourage collaboration on homework and labs. It can be extremely frustrating to struggle futilely on what could be a relatively simple problem. Two heads are better than one: working with colleagues can allow productive cross-pollination of ideas that is highly beneficial all around. Group work in which all parties contribute to the best of their abilities allows each group member to learn more, in less time, than would be possible with solo work.

However, this benefit only extends as far as you are willing to extend yourself as part of a study group. If you find that your study partners are doing most of the work, and you're just tagging along for the free solutions, please consider that homework is a mere 30% of the course grade. You have to be able to do the work yourself to get the 40% of the grade that is based on solo work in the exams.