

PHYS2220: Introduction to Physics II

The Point:

This course is a continuation of Physics I. We will begin with waves, then electricity and magnetism, and proceed through to quantum mechanics. You've now left the part of physics where your intuition about balls and ladders and so on will actually help you, and are now in the realm where you need to build your own intuition from the math. This takes a lot of time and PRACTICE, PRACTICE, PRACTICE. It will often seem to you that you aren't getting anywhere with this intuition development, but if you are practicing, you will get better. However, be aware that once you get to quantum mechanics, there is some question about whether it's even possible to develop intuition. Nearly everything in quantum mechanics is counter-intuitive, but that is what makes it fun, cool and weird!

Why are you here? Physics is the study of the entire natural world, so it is good for everybody to have at least a passing familiarity with the subject. Most physicists consider all other sciences to be subsets of physics, and not just because they are snotty---there's a good reason they see the world this way. Chemical bonds, for example, are formed according to the rules of atomic physics, and understanding biology involves mechanics, electricity and magnetism, and quantum physics. Geology and astronomy are the studies of physical processes (e.g. nuclear physics, fluid dynamics) over long periods of time and large distances.

Physics is a vehicle for learning problem solving. Physics breaks problems down into components, and then applies a few rules to explain nearly everything. This minimalist approach is what makes physics so powerful, and so frustrating. It is not always easy to see how the tools you have help with the problem at hand.

Finally, physics is a great way to learn about your own limitations. Because you live in the natural world, you already have an intuition for how some things work. But often your intuition is wrong. Finding where your intuition differs from reality is one of the main goals of physics. You will often be surprised when you find out that something you always thought was true is just plain wrong. This can make your brain feel "stretchy", which is good for you!

Here's how to find me:

Dr. Stacy Palen SL209 801-626-7030 spalen@weber.edu <http://physics.weber.edu/palen/Phsx2220/syllabus.html>

Office Hours

I'll be in my office on the following days and times. If you need to see me at some other time, shoot me an email, or catch me after class, and we'll find a time that works. There are no office hours on the day homework is due. I did this on purpose to encourage you to begin your homework early! Be aware that Wednesday is my busy committee work day, and I am often out of the office on Wednesday afternoon.

M: 10-11 and 2-3 T: 2-3 R: 10-11

The Points

- **The Warmup Exercise (5%):** These are the ranking tasks, etc. that you remember from the Fall Semester.
- **Homework (35%):** A new assignment every week, due on Wednesday at 11:59 pm through the Mastering Physics interface. You may work together on this homework, but make sure that you do your own work. Each homework assignment contains one extra credit problem. If you do them faithfully, you won't have to worry on the day when everything goes wrong and you just can't get your homework done, or when you fight with the computer about sig figs.
- **Final Project (5%):** More about this on Friday.
- **Midterm Exams (7% each):** There are four midterm exams, spaced 3-4 weeks apart on Friday in LL121. Doing the homework regularly is the best way to prepare for the exams. Makeup exams will be oral. I will make you stand in my office at the whiteboard and do problems while I watch. You don't want that, do you?
- **Final Exam (7%):** The final exam is cumulative.

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- **Lab (20%):** Material covered in lab is fair game for exams or assignments in class.

Some Rules

- **Identical Work:** Some people are confused about what 'cheating' means in the context of a physics course, where much of the work is mathematical, and you are encouraged to work together. To figure this out, try to remember the POINT of going to school---YOU are supposed to learn something! You are spending a lot of money and time on this education. Full value comes from full participation.
- **Lateness:** No late homework is accepted. The extra credit points cover the case of an unavoidable emergency.
- **Attendance:** I will not formally take attendance, except through the warmup exercise. On the one hand, I understand that you are busy people. On the other hand, I will be less helpful if I don't recognize you.
- **Textbook:** The textbook for this class is Physics for Scientists and Engineers by Randall Knight. We will be covering Chapters 20-42 in this semester. You will also need the Mastering Physics Access Kit, and the Lab Manual.

Week of:	Mon	Tue	Wed	Thurs	Fri
Jan 7, 2008	20.1-20.4	20.5-20.7	21.1-21.4	21.5-21.8	Project Day
Jan 14, 2008	22.1-22.3	22.4-22.6	23.1-23.4	23.5-23.8	Problem Day
Jan 21, 2008	MLK, Jr. Day	24.1-24.5	25.1-25.3	Review	Exam 1: 20-24
Jan 28, 2008	25.4-25.6	26.1-26.4	26.5-26.7	27.1-27.3	Project Day
Feb 4, 2008	27.4-27.6	28.1-28.5	29.1-29.4	29.5-29.7	Problem Day
Feb 11, 2008	30.1-30.4	30.5-30.7	31.1-31.3	31.4-31.6	Project Day
Feb 18, 2008	Pres. Day	31.7-31.10	32.1-32.3	Review	Exam 2: 25-31
Feb 25, 2008	32.4-32.6	32.7-32.8	32.9-32.10	33.1-33.4	Problem Day
Mar 3, 2008	33.5-33.8	33.9-33.10	34.1-34.4	34.5-34.8	Project Day
Mar 10, 2008	Spring Break!	Spring Break!	Spring Break!	Spring Break!	Spring Break!
Mar 17, 2008	35.1-35.4	35.5-35.6	36.1-36.3	36.4-36.6	Problem Day
Mar 24, 2008	36.7-36.10	37	37	Review	Exam 3:32-36
Mar 31, 2008	38.1-38.3	38.4-38.7	39.1-39.3	39.4-39.6	Project Day
Apr 7, 2008	40.1-40.3	40.4-40.6	40.7-40.10	41.1-41.4	Problem Day
Apr 14, 2008	41.5-41.8	42.1-42.4	42.5-42.7	Review	Exam 4: 37-42
Apr 21, 2008	Review	Review	Review	Review	Review
Apr 28, 2008		Final Exam, 9:30 am, LL121			