

PHYS 113, Fall 2009

Contemporary Physics I

Lectures: M,W,F 12:00-12:50 pm, Curtis 459

Recitation:

Section 001: W 2:00-3:50pm, Disque 704

Section 002: W 4:00-5:50, Disque 704

Course Staff

- Lecturer: Prof. David Goldberg (*goldberg@drexel.edu*)
Office: Disque Hall, Room 810
Phone: (215) 895-2715
Office Hours: M1-2, WF 11-12 – or by appointment *in advance*.
- Recitation Instructor: Coleman Krawczyk (*ckraw@physics.drexel.edu*)
Office: Disque 808
Office Hours: TW 1-2, Thurs. 2-3 – or by appointment *in advance*

Textbook

Matter and Interaction, 2nd ed., Chabay & Sherwood, Wiley. Copies of this book have been ordered and should be available in the bookstore.

Course Webpage

I will make certain materials available, including images, links, copies of documents handed out in class, and visual python programs available on the course webpage:

http://www.physics.drexel.edu/~ckraw/PHYS_113/

Course Overview

This will be one of the more unusual physics classes that you've ever taken. It will combine classical (Mechanics, Electricity and Magnetism, Thermodynamics) and modern (Quantum Mechanics, Relativity) concepts in a single lecture. You will be required to do all of the standard paper and pencil physics as well as program in a visual language called VPython. Don't worry if you've never programmed before; we'll explain how. In short, this will be a real introduction to the physics that real scientists actually do. After all, I'm pretty sure that the research opportunities in studying blocks on inclined planes are somewhat limited.

Lectures

We will meet three times a week for 1 hour. Lectures will consist primarily of information based on the readings, though you should be prepared to participate in discussion. Homework and reading assignments will be given out in class, and homeworks will be due in lecture *at the beginning of class*. You are obviously expected to attend all lectures, and there is an explicit class participation component to your final mark. In other words, ask questions!

Recitation

Traditionally, recitation is a much more informal part of the class. We will meet in the Physics computing lab for 2 hour each week.

Note: These are Linux workstations (the traditional tools of most physicists). If you spend a lot of time in the department (which we hope you will), you will need to learn enough about Linux to get by. Don't sweat it! We don't expect you to know this coming in, and we consider learning a bit of linux part of your physics education.

The recitations will consist of two parts.

1. The traditional component of recitation will involve discussion of homework problems, review of exams, and discussion of material that may have confused you in class. Since the material on the homeworks is quite challenging, I strongly encourage you to try working on your homework well ahead of time, and bringing your questions to recitation.
2. In order to understand physical concepts, and get a grounding in numerical coding, you will be required to write approximately 5-7 programs over the course of this term. These will employ the Visual Python programming language, and will allow you to create moving realizations of physical concepts. For example, you will run simulations of the earth orbiting the sun, gas particles bouncing around inside of a box, and a pendulum swinging.

Course Policies

Grading

- 10% – **Class Participation:** You are expected to attend all lectures and recitations, to participate in discussions, and to ask questions. Some of the topics we'll be covering are quite esoteric, so if we don't have feedback, we can't be sure you're getting it.
- 30% – **Homework and Recitation Assignments:** Homework will be given weekly. It will be assigned on Friday in lecture, and will be due the next Friday. A 10% penalty will be given for each day of lateness. Your combined scores on your recitation assignments will count as 4 homeworks. The lowest homework will be dropped from your final average.

The problems will primarily be taken from your book, though there will be some which are not. You are encouraged, and expected to discuss your homework with others, but the work you submit must be your own. Copied homeworks (and you'd be surprised how easy this is to detect) will earn a zero for all parties involved.

- **25% – Midterm:** At approximately week 6, we will have a 1 hour midterm during one of the class periods. The questions will be mostly similar in structure to homework problems, so you'd be well-advised to review your homework. However, there will also be some short-answer questions as well.

I will pass out a review sheet a week before, and we will have a review session (during recitation) several days prior to the exam.

- **35% – Final Exam:** During the final exam period, we will have a 2 hour final. It will be similar in structure to the midterm, and will be comprehensive over the entire course.

Academic Honesty

Discussion is strongly encouraged when working through problem sets, but the work you turn in is expected to be your own. Here's a guideline – if a friend describes how to go about solving a problem to you without specifically writing equations, then you are fine. If, however, you directly transcribe the work of another, you are plagiarizing their work.

You may not copy one another's exams, homeworks, or recitation codes. All of these are considered cheating and will be dealt with in the following manner. The first infraction will result in a zero for all parties involved. The second infraction will result in an "F" for the course and a report to the office of academic affairs.

Tentative Schedule

We will cover chapters 1-9 in the book this term, including Newton's laws, momentum, energy, relativity, quantized energy states, and multi-particle systems. We'll average about a chapter a week, so it is very important to keep up with your reading.