PHYS 113, Fall 2007

Contemporary Physics I

Lectures: M,W,F 12:00-12:50 pm, Stratton 219

Recitation:

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

  Section 002: W 4-5:50, 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¡/i¿.

- Recitation Instructor: Travis Hoppe (*hoppe@drexel.edu*)

  Office: Disque 705

  Office Hours: TBA or by appointment *in advance*

Textbooks

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

<u>Fundamentals of Physics</u>, Halliday, Resnick, and Walker. (Recommended). You are not required to by this book. However, a few copies will be made available in the undergraduate lounge, and I will often give supplementary reading suggestions based on HRW. Again, this is not required, but is simply a way of getting a different "take" on the material as discussed in the primary text.

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/courses/Physics-113

Course Overview

This will be one of the more unsual physics classes that you've ever taken, and that we've ever taught. It will combine classical and modern (e.g. Quantum Mechanics) concepts in a single lecture. You will be required to do all of the standard paper and pencil physics, simple programming in a visual language (don't worry, we'll explain how) and. 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 there will also be some in-class demos. 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 short 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.