Syllabus for Physics 462
Fall 2012

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Course times: MWF, 12:00pm – 12:50pm, MH357
Office hours: W 2-4pm, Th 11:00am – 12:00pm, 2:00pm-4:00pm, CTLM 224

TA office hours W 9am, MH computer lab

Textbook: Electromagnetism, Pollack & Stump, 1st Ed.

Prereq: PHGN 361. Strictly enforced.

Course Wiki

We will be using a wiki page for this course:

http://ticc.mines.edu/csm/wiki/index.php/PHGN-462_Fall-2012

Notes, homeworks, etcetera will be posted there.

Academic Dishonesty Policy

The campus-recommended consequence for **any** confirmed instance of academic dishonesty is an F in the course.

Excused Absences

If you have to miss a class for a legitimate purpose and you want to receive clicker credit for the day, notify the instructor ahead of time (when possible; soon after if not) and bring documentation. Note that CSM defines 'legitimate' as a medical issue, a death in the family, or an officially-sanctioned activity such as a varsity sports event. Everyone will receive two free excused absences, **so if you aren't going to miss more than two days, no action is necessary on your part.**

Overview

PHGN 462 is the second semester of the upper-division treatment of electromagnetism. We will focus primarily on dynamic situations, with somewhat more coverage of applications than in 361. In short, we'll cover elements of chapters 11-15 in Pollack & Stump with some supplementary material.

Learning Objectives

The learning objectives for this course are:

1. to understand the fundamental laws of electromagnetism as summarized in the Maxwell equations and related concepts and principles;
2. to be able to apply these laws in conjunction with the fundamental laws of motion using vector calculus and differential equation;
3. to construct an appropriate understanding of the electromagnetic properties of physical systems in an applied context; and
4. to mesh mathematical skill and conceptual understanding while solving challenging physics problems, with a stronger emphasis on numerical methods than in 361.

Grade breakdown – Book reading: 5%

We will be moving fast, and we will not do every little detail in class. For lecture to make sense, it is imperative that you read the book sections noted on the course schedule before you come to the corresponding lecture. You will learn much more in lecture if you read than if you don't; more than enough to offset the additional time investment by reducing your study time later.

I'm well aware of the fact that college students don't often read textbooks, so as an incentive, 5% of the course grade comes from reading the book. This, of course, will have to be strictly on the honor system. At the end of the semester I'll ask you to report on how often you read the book and assign credit accordingly. Please take this seriously.

Lecture/recitation participation – 5%

We will be using clickers. Obtain one and bring it to class. **IMPORTANT NOTE:** If you have a clicker that was purchased later than August 2011, it may have an erroneous ID stamped on the back. I can fix that if you bring it to me.

Homework – 30%

As you must have noticed by now, much if not most of the learning that happens in a physics course happens on the homework sets. We will have weekly homework, with problems from the book and from elsewhere. Homework will be assigned on Fridays and will be due on the following Fridays.

Much of your homework score will be based on diagramming and explanation. I will post examples of what I have in mind.

I realize that solution stashes and solutions manuals are readily available. Once again, I'll request that we use the honor system. Working off of old solutions is not allowed, and counts as academic dishonesty. You will not need to get every point on every problem to get a good grade in the class, so don't let yourself feel pressured.

Do feel free to work in groups. Don't let the group do everything for you. Don't turn in identical homeworks.

Exams: 15%, 15%, 15%, 15%

We will have three exams during the semester, and one final exam. The first two exams and the final will be traditionally-structured exams covering conceptual understanding and problem-solving.

The third exam will be an oral exam, one-on-one, in roughly the style of oral comprehensive exams in graduate school or oral technical interviews in industry. Being able to solve problems out loud in front of someone is a critical skill for any scientist or engineer. That skill gets neglected in courses with large enrollments, but we're going to make it happen. I think you'll find it quite satisfying.

Grading:

This is an upper-division physics course, so we will not use a straight 90/80/70/60 scale. The entire course will operate on a fairly generous curve. As an extreme example, if the top score on an exam is 37%, then 30 or above will be A territory. In other words, don't panic. You'll probably do fine in the course as long as you're working hard. But at the same time, this is a core physics course, not a survey-style elective. A's are not automatic.