Syllabus for Physics 222 Winter 2013
Electricity & Magnetism

Instructor:
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Office Hours: M 2-2:50pm (Phys299), TTh 1-1:50pm, W 11-11:40am

Text
1. “Physics for Scientists and Engineers”, 3rd ed., by Knight
2. Homework: MasteringPhysics: to register go to masteringphysics.com and use the class ID:
   PHYS222WINTER13HELLER
3. Knight Student Workbook
4. "Tutorials in Introductory Physics" by Lillian McDermott, Peter Shaffer and the Physics Education Group.

Note: the bookstore sells bundles of 1-3 (ISBN: 9780321844354) and of 4. You may also purchase your materials online, however, if you get a used textbook you might have to purchase your MasteringPhysics license separately, at: www.masteringphysics.com

Tools
A scientific calculator will be required. Flash drives, colored pencils, a protractor, a ruler, and graph paper will be helpful.

Meeting Times
Lecture: Section 2: MTThF 11-11:50, SAM206
   Section 3: MTThF 12-12:50, SAM206
Lab: Section 2: W 2-3:50, SAM205
   Section 3: W 12-1:50, SAM205

Content
Gravity (Chapter 13) and electricity and magnetism (Chapters 26-34). We will study the following topics: electric field and potential, DC circuits, magnetic field, magnetic induction and possibly RL, and LC circuits.

Note: This syllabus is subject to change. Please check online for the most recent version. I usually include your feedback on office hours etc.
Goals

*Physics Department Outcomes*

1. Understand the interconnectedness of mathematics and physics. Specifically the application of calculus, trigonometry, geometry & systems of equations.
2. Understand how physics variables and equations relate to mathematical variables, functions and operations.
3. Extract abstract physical principles from observations of the physical world.
4. Actively apply and informally experiment with physical concepts in daily life.
5. Designing, performing and analyzing experiments in and out of the classroom environment
7. Critically comparing theoretical physical models to empirical ones.

*Outcomes for Physics 222*

1. Understanding the concept of charge and charge conservation.
2. Understanding concepts of current & voltage within DC circuits.
3. Connecting potential difference within circuit to potential difference in electrostatics.
4. Understanding applications of electricity and magnetism in your environment.
5. Understanding magnetic force and its comparison to other forces.
6. Knowing how to produce magnetic fields and calculate their strength.
7. Knowing how to produce electric fields and calculate their strength.
8. Visualizing electric fields, electric potentials and magnetic fields.
9. Applying integral calculus in the calculation of electric potential, electric fields & magnetic fields.

*Assessment*

Exams: 70%.
Lab write ups: 20%
Homework: 10% (online component 2/3, workbook 1/3)

*Exams*

There will 4 exams. I may not grade all of the exams. I may only grade parts of an exam. This is unlikely but possible. Dates will be given as we progress through the quarter. There won't be any makeup exams, the lowest exam score will be dropped. There will not be any special final exam.
Labs (also see at the end of the document)
There will be weekly 2 hour labs. During this time, we will conduct an experiment, do a tutorial or go over problems together on the board.
1. **Attendance is mandatory.** If you are absent during the lab you may not receive a score for that lab.
2. Lab reports are typically due at end of the week following the lab, specific dates and times will be given in class and/or on the website. I will give you details about what to turn in for each experimental lab. I will require ONE lab report per group unless I specifically say otherwise.
3. PreLabs: Occasionally, you will be required to do an assignment *before* you come to the lab. PreLabs are typically to be done INDIVIDUALLY, not one per group.
4. Lab report drafts are strongly encouraged but not required. They help you do your work efficiently and more effectively. You must turn in your draft on the Monday following the lab.
5. The lowest score on your lab write-ups will be dropped (details in class).

**Homework**
There will typically be two different types of homework assignments:
1. *Mastering Physics Homework* assignments (e.g. Hw_13_01): roughly twice a week (typically due several days after the corresponding material has been covered in lecture), on MasteringPhysics. These are intended to allow you to more deeply explore the material.
2. *Workbook* (e.g. Wkbk Chapter13): roughly once a week (due in class several days after the corresponding material has been covered in lecture).

Due dates will be announced in class and posted on the course website (and/or MasteringPhysics). Solutions to the assignments will be posted on the website.

Start working on your homework assignments as soon as we have covered the material in class. This will allow you to ask questions and work on difficult problems with others. I strongly recommend that you discuss problems with your classmates, however, your final work has to be your own, not a copy of somebody else's work.

Note that late homework may not be accepted. If it is, there may be a deduction. If you have trouble finishing your work on time please let me know ahead of time, not after the due date. The lowest homework score will be dropped.

**Phys299**
You are encouraged to sign up for Phys299. This class will allow you to better understand class material and help you with homework problems. Details will be announced in class.

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Special Assistance

If you need course adaptations because of a disability, if you have emergency medical information to share with me, or if you need special arrangements in case the building must be evacuated, please see me during my office hours as soon as possible. I am happy to help you in any way I possibly can.

How to Succeed in Physics 222

1. Attend class every day. If you miss class be sure to find out what you may have missed. Do not assume that the schedule will not change.
2. Read your text. Your text is very well written (for a physics text). Plan 3 pages/hour to really understand what is being said. Read with a pencil – do sample problems, summarize sections, etc.
3. Do your homework regularly and as soon as possible. You must practice daily in order to allow your mind time to absorb and organize the physics we are studying.
4. Hand in drafts of your lab reports. Students who take advantage of this service consistently score 10+ % higher on their labs.
5. Collaborate but don’t hide behind others. While working and studying in groups is encouraged, make sure to spend time on your own organizing your work or rewriting your homework or labs in your own words.
6. Ask for help as soon as you need it. Do not wait until you are really behind or confused. Feel free to drop by during office hours or email me with your questions.
7. Physics 299 meets weekly (depending on staffing). Consider enrolling in this problem solving course for physics students. Even if you are not enrolled in the class you are welcome to come to get help with your work. Also utilize the tutoring center.
8. If you have a personal/family emergency that is affecting your ability to work in or attend the class be sure to contact me as soon as possible so that we can discuss appropriate accommodations to help you to succeed in the class.

And let’s not forget ... .. to have fun 😊