

Physics 441

8-10 MWF

C266 ESC

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Description

This is an advanced undergraduate course in electromagnetism. The textbook is David Griffiths **Introduction to Electrodynamics**. It is the best book on this subject I know of and you should plan to keep it because you are going to spend a lot of time and effort reading it. When I took this class Physics 122 was a dim and distant memory, so encountering the material again at a more advanced level was a little scary. You may have the same experience, so I will try to remind you of the freshman basics as we go along in addition to covering the more advanced material that is the main object of the course. We will also be doing some computational exercises along the way. This is important because electricity and magnetism is usually done numerically when it shows up in practical problems.

Reading the Text This is important. I expect you to read the sections indicated on the course schedule before class. At the beginning of every class period I will give you a piece of paper on which you will indicate whether you have read the assignment or not and then you will sign it in blood. Yes, this means that you can cheat, but Prof. Maeser and I expect you not to. These reading assignments will count for 5% of your grade.

Homework

Homework assignments are due as indicated on the schedule. The homework is the heart of the class, and chances are that you will struggle with at least some of the assigned problems. This means that you will need to get some help. I have four suggestions. (1) Work in small groups of 2 or 3. You will be able to learn much more this way than I can teach you because you will learn by explaining things to others. I know it sounds weird to try to learn by teaching, but as you fight over the problems in your groups you will have the glorious experience of having the light come on in your head, and then explaining it to someone else. In your groups please organize things so everyone gets a chance to take the lead on a problem. **Do not, however, hand in copies of other students work.** Once everyone in the group can see how to do a problem, each student should write out their own version of the solution in their own style. (2) Come to the weekly help sessions that will be scheduled early in the course. I will be there to answer questions. (3) Look at the Physics 441 web page, available under *Index of Physics and Astronomy Course Pages* on the department home page. One of the offerings there is homework help, and I will try to post useful information there. (4) Come see me, or send me a question via e-mail.

Computational Problems

Sprinkled among the standard homework problems are a few problems that develop computer skills. This is how physics is done these days, using the computer to push the envelope instead of just writing on the back of it. These problems will be difficult, but if you find yourself doing a research problem in electromagnetism someday you will be glad you had to do these problems.

History Questions Some of the assignments have simple questions about the history of electricity and magnetism. You can get the answers from any source you like, but I would suggest that you look for them in *A Ridiculously Brief History of Electricity and Magnetism*, found in your packet and on the course web page.

Exams

There will be 3 exams given during the semester and a comprehensive final. All exams will be timed exams in the testing center except for the final which will be held in our regular classroom for 3 hours on Wednesday, June 14 from 7-9 AM.

Grading The semester exams are worth 30%, the 122 review is worth 5%, the reading is worth 5%, the final is worth 25%, and the homework is worth 35%. I tend to grade by finding where the top cluster of students is, giving them A's, then coming down in 5% steps to give the rest of the grades. This is only a rough rule and I violate it regularly, but not by much.