Syllabus

Instructor

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Phone : 781-736-2879  
Office Hours : M, W, Th 11 am – 12 pm and 1 – 2 pm

In addition to these office hours, you are welcome to come to my office any time I am in, or you can make an appointment by phoning or emailing me.

Course Overview

This course is the second semester of the introductory physics honors course. It will cover electromagnetism plus a brief introduction to special relativity. We will cover roughly one chapter of the text each week. Each chapter is about 40 pages of reading, which you are expected to do before the class in which we discuss the material.

Success in this 4 credit hour course is based on the expectation that students will spend a minimum of 9 hours of study time per week in preparation for class (readings, homework, discussion sections, preparation for exams, etc.).

Latte

I will use Latte to post everything for this course. This includes reading assignments, homework assignments, solutions to assignments, scores on assignments and exams, and extra material.

Grading

Your grade will be based on homework scores, two midterm exams, and a final. I will calculate a weighted score for the course (40% for homework and 20% for each exam) and
assign grades based on your score. I will nominally aim for a class grade point average that is in keeping with average university grades, that is, around a 3.15 to 3.2. If I think the class did better or worse than expected, I will adjust the GPA.

At the beginning of many classes, there will be a very short reading quiz to determine if you read the assigned material. If you have read the material, the quiz should be easy.

As you can see from the weights, I think homework is important. I strongly encourage you to work with your fellow students on problem sets, keeping in mind that you must understand things for yourself. Since I expect students to work together, I expect to get similar solutions to problems, but you must write up your solutions yourself, that is, no photocopying or direct copying of someone else’s work.

If a plot of a function or data is requested in a problem, this must be a computer-generated plot (not hand drawn). This can be done with MATLAB, Mathematica, Excel, or any of a number of other programs. If anyone would like help with one of these, please come see me. The axes of the plot must be clearly labelled with the quantity plotted and any relevant units.

Each homework assignment will have a due date, usually a week after it is given out. Homework will be considered late if I receive it after the solutions are posted, which could be any time after 4:00 pm on the due date. Late homework will be graded and will receive 50% of score it otherwise would have received. You may turn in partial homework sets. Thus, if there is a problem that you just can’t get, you can turn in everything else on time and then turn in the troublesome problem after viewing the solutions. As with working with your fellow students, you must write your solutions, that is, read and understand the solution and then write it in your own way. If you are having difficulty with a problem, you should talk to your classmates, the teaching assistant, and/or me.

As with most physics classes, the material is very cumulative, that is, understanding the later material requires you to understand and retain the earlier material. Thus, I very strongly recommend that you DO NOT fall behind in your work in this course.

The midterms will during the scheduled recitation section time Mon. 6:30 – 9:30 pm (we will not use the entire time for midterms), and the final will be during the final exam period (see schedule below). The exams will be closed book and closed notes. However, for each exam, you may bring one \( 8\frac{1}{2} \times 11 \) sheet of paper with anything written on it you like (both sides). Calculators may be used on exams for arithmetic calculations. No other electronic devices may be used during the exams, including cell phones, MP3 players, and computers.
Text

The required text for this course is *Electricity and Magnetism* (3rd edition), E. M. Purcell and D. J. Morin, Cambridge University Press, ISBN 978-1-107-01402-2. We will cover the entire book.

I also highly recommend the mathematical physics book *Mathematical Methods in the Physical Sciences* (3rd edition), Mary L. Boas, John Wiley & Sons, Inc., ISBN 978-0-471-19826-0. It is a valuable resource for many areas of math useful to physicists, including several that we will learn about in this course. Several recent physics graduates have said that it is a very helpful reference to have. We will not be using it directly, but I will point out sections of it that are relevant to the course.

Recitation Section

There is a scheduled recitation section time Monday, 6:30 to 9:30 pm, which we will utilize this semester.

Math background

For this course, I assume you know differential and integral calculus for one variable. I also assume that you were introduced to calculus of several variables in Phys 15a. We will review and extend the concepts from multi-variable calculus we need as we come to them. For other math topics (such as matrices, complex variables, and complex functions) we will introduce the necessary concepts as we need them. Taking multi-variable calculus or linear algebra before or concurrent this class would make things easier but is not required. If you are considering taking one or the other for Physics, I recommend you take multi-variable first.

Schedule

This class meets M, W, Th 12:00 to 12:50 pm. The exceptions to the usual class meeting times are

- Jan. 21, Martin Luther King day
- Jan. 22, Brandeis Monday
- Feb. 18-22, Midterm recess
• Apr. 19 - Apr. 26, Spring recess

• May 2, Brandeis Friday

The midterms will be Monday, Mar. 4, and Monday, Apr. 1. The final will be a three hour exam during the regularly scheduled time for this block (Block E) during the final exam period. As of yet, there is not even a tentative time for this final.

Documented Disabilities

If you have a documented disability with an appropriate accommodation for this course, please give me documentation as soon as possible.