

Instructor: Peter W. Stephens
Office: B134
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Alternate phones: 344-5816, 344-5578
Office hours: TBA once the semester gets started

Lectures are MWF, 10:40-11:35 in room P112.

Grader: TBA

Required Text: J.D. Jackson, *Classical Electrodynamics*, 3rd edition. (Wiley, 1998)
Supplementary Text, 1st semester: H.M. Schey, *Div, Grad, Curl, and All That*, 3rd edition (Norton, 1996).
Supplementary Text, 2nd semester: E.F. Taylor and J.A. Wheeler, *Spacetime Physics*, 2nd edition (Freeman, 1992).

The **grade** will be determined as follows:

20% each on two midterms, no notes or book allowed, currently scheduled for October 11th and November 13th.

30% homework,

30% final exam, scheduled (by the University) for December 22nd, 8:00 AM.

Homework will be assigned weekly, generally on Fridays, and will be collected for grading, generally the Monday ten days hence. Solutions will be handed out on the due date; accordingly, late homework will not be accepted. I will seek to assign a mixture of problems, from relatively simple ones which help to gel concepts and techniques presented in lectures and the text, to difficult ones that ought to take a week of (intermittent) hard work. Both kinds of problems are important for your mastery of the field.

Physics coursework, exemplified by classical electrodynamics, is a contact sport. However much you enjoy listening to the lectures and letting your eyes caress the pages of the text, you are not likely to learn anything without getting your hands onto tough problems, ones that don't yield immediately.

Policy on working together: I strongly encourage students to study together, discuss the material, and cooperate on the homework problems. It should be perfectly clear that this means tackling the problems and discussing how to reach the solution together. Once the solution is grasped, each person is responsible for completing the work that they turn in. One indication of whether you are doing that is whether you can write your solution without referring to what a colleague has written. It is **ABSOLUTELY** not acceptable to divide up problems, so that one person solves 1, 3, and 5; another solves 2, 4, and 6, and

they exchange answers before turning them in. The exchange of information between students on any of the class exams is unacceptable.

I will hold a weekly **recitation**, Thursdays from 4:00 to 6:00, in room B133, at which I will be available to discuss homework problems, supplementary material, etc. These will not be required, but I hope that a majority of the students will find them useful. I will not present any new material at these recitations, but use the time to review material desired by the attending students. Bring questions! If there is not sufficient interest to justify holding regular meetings, the Department will probably find another teaching job to occupy my “spare” time.

Material:

First semester: Electrostatics and magnetostatics, including dielectric and magnetic materials. Maxwell equations, plane wave solutions, including in media, boundaries.

Second semester: Waveguides and resonant structures. Scattering and diffraction. Special relativity. Radiation. Motion of charged particles in electromagnetic fields.

Zeroth assignment:

Obtain a copy of Jackson, and read the Introduction and Survey, and the Appendix on Units and Dimensions. You will also want to follow along the material covered in class in Chapter I.

If you are not reasonably confident about vector calculus, get the suggested book by Schey and start to work through it.