

University of Maryland

Department of Physics

Fall 2026

Prof. Steven Anlage

Physics 313

Title:

PHYS 313 Electricity and Magnetism I (4) A first course in electricity and magnetism at an advanced level. Electrostatics; solutions to the Laplace and Poisson equations in cartesian and spherical coordinates; electric fields in matter; and magnetostatics. Study of boundary value problems and extensive use of vector calculus. [This is a 4 credit course.](#)

Prerequisite:

MATH241, PHYS273, and one of the following: PHYS274, MATH240, MATH243, MATH246, or equivalent courses. Knowledge of differential and integral calculus techniques. You are also expected to know basic electromagnetism at the level of Phys 272 and 273 (e.g. integral forms of Gauss's Law and Ampere's Law).

Instructor:

Prof. Steven Anlage, Room 1363 (Toll/Physics/Quantum Materials Center).
Phone: 5-7321, e-mail: anlage@umd.edu,
Web: <https://anlage.umd.edu/>

Teaching Assistant:

TBA, ??? Physics, x5-???, ??@umd.edu

Schedule:

Two lectures weekly,
TuTh..... 12:30pm-1:45pm (PHY 1410)
And a 1 hour discussion F.....12:00noon-12:50pm (IRB 1116)

Required Text:

David J. Griffiths, [Introduction to Electrodynamics](#), 5th Edition.

Lectures:

You will be responsible for material presented in lecture that is not in the book. If you miss a lecture you are responsible for finding out from a classmate what we did in class.

Homework:

The homework assignment will be given in class on Tuesdays. The assignment will be due (as uploads to ELMS) at the beginning of class on the following Tuesday.

Doing the homework is an essential part of this course! Homework will be graded by the following week.

Late homework is accepted, but will receive a grade of 0. There is an absolute “no excuse” policy for late homework. As compensation, the 2 lowest homework scores will be dropped in the final grade calculation.

Recitations:

The recitations are designed to help you master the skills needed to solve problems and develop a deep understanding of electromagnetism. We will work on problems similar to those due for homework the following week.

Quiz:

A quiz will be given at each recitation, based on homework that was due that week. The quizzes will be in-class and closed book. Missed quizzes will receive a grade of 0. There is an absolute “no excuse” policy for missing a quiz. As compensation, the 2 lowest quiz scores will be dropped in the final grade calculation.

Exams:

There will be two “mid-term” exams and a comprehensive final exam. The exams will be in-class and closed book. All exams will be counted towards your final grade. Make-up exams (for any of the exams) must be requested well in advance of the exam; the reason for the absence must be documented and in accord with [University policy](#). If an exam is unexpectedly canceled (due to inclement weather, etc.) it is automatically rescheduled for the next full class period (i.e. a Tuesday or Thursday).

In grading, we are looking as much at the reasoning that you use, as well as the final number you arrive at. So remember to carefully set up the problem on paper, even if you cannot see the way through to the solution.

The final exam is Friday, December 18 from 4:00 to 6:00 PM.

AI/Large Language Models

Learning how to use AI/LLMs to improve your understanding is an important skill. Critical thinking is required to utilize AI in an effective manner. UMD provides AI resources for students through [TerpAI](#). However, all homework that you submit should reflect your understanding and be presented in your own voice. Remember that all quizzes and exams are in-class activities where you have to use your native understanding to solve problems, without the benefit of external tools.

Final Grade:

Based approximately on homework (~15%), quiz/recitation (~15%), mid-terms (~45%), and final (~25%).

Academic Dishonesty (cheating):

Academic dishonesty is a serious offense that may result in suspension or expulsion from the university. In addition to any other action taken, the normal sanction is a grade of “XF”, denoting “failure due to academic dishonesty,” and will normally be recorded on the transcript of the offending student.

Office Hours

You are strongly encouraged to attend office hours to ask questions, discuss the homework problems, and talk about physics in general.

Office hours will be Monday 5:00-6:00 pm (location TBA).

Tips For Doing Well in This Course:

1) Read the assignment in the book *before* and *after* the material is covered in lecture. The book is very well written and quite entertaining to read.

2) Freely ask questions in lecture, after lecture, and during office hours. Also discuss problems with your friends and classmates.

3) Work all of the homework questions and problems. You are allowed and encouraged to discuss homework with anyone you wish. However, in order to really learn, don't just copy solutions from somewhere or someone else; rather, work through them in detail yourself. Start the homework problems early in the week and think about them while doing less demanding things. Afterwards, make use of the solution sets, your TA's office hours, and me to make certain you understand all of the solutions. The exam questions will sometimes involve homework problems.

4) Seek help immediately if you do not understand the material or can't solve the problems. Help is available from your TA, and from me. Don't wait until just before the exams!

5) Remember that you are responsible for material discussed in class, even if it does not appear in the textbook.

What Should You Learn in this Class?

Electromagnetism is a beautiful and self-consistent description of very rich phenomena. It is the field theory that all other field theories (like superstrings, etc.) try to emulate. A deep understanding of E+M is part of what makes you a physicist. Another aspect of your education is learning to solve physical problems using advanced quantitative techniques, such as integral and differential calculus. This course will introduce you to these, and other pleasures of theoretical physics.

Honor Pledge

The Honor Pledge is a statement undergraduate and graduate students are asked to write by hand and sign on examinations, papers, or other academic assignments not specifically exempted by the instructor. The Pledge reads:

"I pledge on my honor that I have not given or received any unauthorized assistance on this assignment/examination."