Introduction

Welcome to Physics 1252! This course is the second half of a two-semester introductory sequence. This semester we’ll focus on electromagnetism, one of the four fundamental forces of nature. The understanding of electric, magnetic, and optical phenomena as different aspects of the same underlying force was a crowning achievement of 19th century physics. Without this understanding, our modern electronic world wouldn’t be possible.

Objectives

As with last semester, the primary objective of this course is to engage you in a process that is central to physics: Modeling physical phenomena by applying a small set of fundamental principles. The modeling process encompasses explaining and predicting physical behaviors; making appropriate approximations and simplifications for complicated physical systems; and communicating results through mathematical and numerical expressions, diagrams and visualizations, graphs, and even "plain English."

The ordering of topics this semester will be different from the traditional sequence. We’ll start with optics, the study of light and how it interacts with matter. You will then learn about electric fields and electric potential. You will see how to apply those concepts to study electric circuits and currents (moving charges). Next we’ll discuss the magnetic field, and how electric and magnetic fields interact with each other.

If you are not an engineering major, then this course is probably not for you! If you’re considering a major in physics or astronomy, please talk to me, Dr. Cooley (physics), or Dr. Caillault (astronomy) about other options.

Prerequisites

Some differential and integral calculus will be used in the course. It is important that you be registered for the second semester of the calculus sequence (Math 2260 or equivalent), if you haven’t already taken it. In order to do well in this course, you should also have a working knowledge of college algebra, trigonometry, and plane geometry. A prior high school physics course is useful, but not required.

This course will continue to make use of the fundamental principles that you learned to work with in first-semester physics (forces, momentum, energy). Prepare to review that material if you’re feeling rusty!

Basic Information

Instructor: Dr. Craig Wiegert  
Email: wiegert@physast.uga.edu

Office: 215 Physics Building  
Phone: 706-542-4023

Class: MF Period 4 (11:15–12:05), W Periods 4–5 (11:15–1:10), SciLC 145

Final Exam: Mass Final time, Tuesday 11 December, 7:00–10:00 pm, location TBA

Office hours: TBA
Course Resources

Required Materials

- *FlipItPhysics: Electricity and Magnetism*, by Gladding, Selen, and Stelzer (Macmillan). As bundled in the bookstore, this is an online resource system combined with a textbook (Tipler/Mosca). Use course access key *cw1252f18* to enroll online. You will use this material primarily to prepare for class.
- An in-class response device or app (“clicker”) from Turning Technologies. Bring it to every class; we will be using clickers throughout the semester for participatory activities.
- A scientific calculator. A simple calculator such as the TI-30X series will do just fine, but a fancier graphing calculator is also acceptable. The use of calculator graphing, algebra-solving, or programming functions will *not* be permitted for any exam, nor will tablets, mobile phones, etc.

Online Resources

- The eLearning Commons will serve as another repository of course information: homework and exam solutions, grades, course announcements, etc.
- Online assignments, both before and after class, are an essential part of the course. You’ll complete this work both within FlipItPhysics and on the LON-CAPA homework system at *https://spock.physast.uga.edu/*.

Academic Support

- Office hours are your chance to get one-on-one or small-group help with homework assignments or with understanding topics from class. Please make use of this time; I can’t address your questions if you don’t ask!
- If you can’t come to my regular office hours, or need additional help, please set up an appointment (by email, by phone, or in person) to see me outside of class.
- The Division of Academic Enhancement (DAE) offers free peer tutoring for some of UGA’s most challenging courses, including this one! In addition, the DAE provides Academic Coaching, Student Success Workshops, and more.
- Tutors are also available through Department of Physics and Astronomy.

Grading Policy and Assignments

Your overall grade will be determined from your course performance, weighted as follows:

- 20% Cumulative final exam grade
- 45% Three in-class exams (20%/15%/10% for highest/middle/lowest grades)
- 10% Homework grade
- 15% Laboratory grade
- 5% Pre-class preparation
- 5% In-class participation
Overall letter grades will be assigned according to the following cutoffs:

- A– = [87.5, 90)
- A = [90, 100]
- B– = [77.5, 80)
- B = [80, 85)
- B+ = [85, 87.5)
- C– = [67.5, 70)
- C = [70, 75)
- C+ = [75, 77.5)
- D = [60, 67.5)
- F = [0, 60)

Numerical grades will *not* be rounded (i.e., 89.99 is still an A–).

Any requests for a regrade of an assignment or exam must be made no later than one week after the item is returned. For a regrade I will look at the entire assignment/exam, not just one problem, and this may raise or lower your score. Regrade requests (including those for online homework) should be accompanied by all your work.

Like any other measurement, grades possess a degree of uncertainty. Factors such as improvement, effort, and participation *may* help borderline grades. Lobbying, however, will not, and requests for extra credit will be ignored, so don’t ask!

**Exams**

All exams will be closed-book and closed-notes. You may use a scientific calculator *for arithmetic only*, not for algebra, calculus, or graphing; all memory and programs must be cleared. I’ll provide you with a formula sheet for each exam, and will also post it to the Web before the exam. The formula sheet’s purpose is to focus your study on understanding rather than memorizing.

Exams will comprise both conceptual and problem-solving questions, similar to homework, practice problems, and in-class examples. Unless told otherwise, you must show your work on each problem in order to receive full credit. Partial credit is awarded (based on your work) for incomplete or incorrect answers, so it is usually in your best interest to attempt every problem.

Exams are designed to test your understanding thoroughly and to distinguish among levels of performance. In order for exams to be effective assessments, raw scores will often be lower than the expectations created by the “standard” letter grade cutoffs. These raw scores will be “rescaled” into numerical grades. This conversion is based mostly on the difficulty level of the exam and partly on the distribution of raw scores. Your rescaled grade will *never* be lower than your raw score. Also, unlike a “grade curve”, you are *not competing* against your peers; it is possible for everyone to get an A or B, for example.

*There will be no make-up midterm exams.* If you need to miss a midterm exam for a serious, documentable reason, your final exam grade will be substituted for your one of your midterms, making your final exam worth 30-40% of your overall grade (depending on how this grade compares to your other midterm exam grades). This policy is designed to handle unavoidable situations like medical or family emergencies, or previously scheduled academic or athletic events. You *must* contact me as soon as you know of the conflict (before the exam if at all possible), and you must provide sufficient documentation in a timely fashion. (An example of unacceptable documentation is a note stating only that you visited the health center, with no indication of the severity and nature of your illness.) Do not presume that your situation
or documentation merits an excused absence; that determination is not your prerogative. *Unexcused exam absences will result in an exam grade of zero.*

A make-up final exam will be given only for legitimate, documentable reasons as explained above.

**Homework**

Sustained practice with physics problems is crucial to understanding physics, so you will have regular homework assignments. Assignments will be posted online through LON-CAPA, and most problems will require you to submit your answers online. However, a few assignments may also have a handwritten component. Detailed solutions will be posted to eLC after the due date.

Assignments will be weighted equally unless otherwise specified. At the end of the semester, *provided that you complete a course evaluation*, I will drop your lowest two assignment percentages in calculating your overall score. (If you don’t submit a course evaluation during the allotted time, then none of your assignments will be dropped.) This dropped-assignment policy compensates for the unavoidable circumstances that may occasionally prevent you from submitting homework on time (e.g., illness, scheduled event, Internet failure, etc.). *Late homework won’t be accepted or excused.* However, even if you miss the deadline to submit homework answers for credit, you should still make every effort to work through all the problems on every assignment, in order to master the topics covered. You will likely do very poorly on exams if you don’t work through each assignment in its entirety.

Teamwork is an effective way to learn, so I encourage you to collaborate with your classmates. Ask them questions; critique others’ work; explain your reasoning to your study partners. However, *don’t mistake teamwork for plagiarism.* You’re responsible for understanding all the details of every solution, and *your solutions must be your own.* Copying from *any* source of homework solutions is a violation of academic honesty policies. Since you can’t collaborate on exams, homework is your best opportunity to develop your *own* problem-solving skills. If you’ve read this far in the syllabus, please write your favorite color next to your printed name on the agreements form. Don’t discuss this with your classmates. Let’s see if they read the syllabus thoroughly too.

**Labs**

Lab activities will usually take place during the longer class on Wednesdays, although you might also perform “mini-labs” during some other classes. Lab work is a group effort; your group will hand in one report to be graded as a team. Because teamwork is so important to the success of labs, *there are no make-up labs,* and group members who are absent will receive a grade of zero for that lab. However, similarly to homework, I will drop your *single* lowest lab score at the end of the semester if you complete a course evaluation during the allotted time. You will have an opportunity to evaluate yourself and your groupmates on each person’s contributions to the team, and this evaluation will affect your overall lab grade.

**Class Preparation**

Pre-class lecture video viewing and textbook reading take the place of in-class lectures. This preparation *before* class is essential for you to learn well *in* class, just as it would be for
a literature course. You’ll regularly answer a few questions before class based on these materials to gauge your understanding.

In-Class Activities
You will often be asked in class to work on conceptual and quantitative questions, both individually and in small groups, and often using the “clickers”. These activities allow you to demonstrate your sincere effort and active class engagement.

A fraction of these in-class activity scores will be “dropped” (similar to the fraction of dropped homework assignments) to compensate for the occasional absence, clicker malfunction, or similar issue. I will not accept a written record of your responses as a clicker substitute, or otherwise excuse any absence from class.

Other Course Policies

In-Class Technology
During class, mobile phones, tablets, laptops, etc., must be in sleep and/or silent mode when not being specifically used for an activity. We have a limited amount of time in class; it’s detrimental to spend it distracted or distracting others by texting, checking Instagram, and so forth. As an exception, devices with a stylus are allowed for note-taking purposes. However, standard laptops will not be useful for taking notes during class, due to the nature of the material (diagrams, equations, graphs, group work).

Disability Accommodations
I will make every reasonable effort to accommodate students with documented disabilities. Students requesting accommodations must provide documentation from the Disability Resource Center in a timely fashion.

Academic Honesty
UGA has a comprehensive academic honesty policy, *A Culture of Honesty*, which is available from the Office of Instruction at [http://honesty.uga.edu/](http://honesty.uga.edu/). This policy covers all academic work. All students are responsible for fully understanding and abiding by this policy. If you have any questions about the appropriateness of your actions or your work, you are obligated to ask me for clarification.

As a UGA student, you are responsible for knowing and understanding this policy. If you have any question about the appropriateness of your actions or your work, you are obligated to ask me for clarification.

I take the issue of academic honesty very seriously, and it is my responsibility to uphold the University’s policy. This means, among other things, that I won’t hesitate to report evidence of dishonesty to the Office of Academic Honesty. Typical consequences of academic dishonesty on homework or an exam range from receiving a zero for that grade, to failing the course, to being suspended from UGA.
Withdrawals/Incompletes

The Undergraduate Bulletin and the Registrar’s Office website describe the University policies regarding withdrawals and incompletes. If you don’t complete the initial required administrative tasks of the course (e.g., the questionnaire and agreements), or are demonstrably not attending class and completing work, I may withdraw you from the course for “excessive absence”.

If you are considering withdrawing from the course, you should discuss your choice with me beforehand. In many cases, students are doing better in the course than they think they are. A grade of Incomplete is not appropriate for a student who has missed a large portion of the course assessments, for whatever reason.

Student Distress

If your course performance is significantly affected by issues beyond your control, I urge you to let me know and to seek assistance promptly from Student Care and Outreach. It is always easier to address exceptional circumstances when you raise these concerns as early as possible. Waiting until the end of the semester to take action may limit my ability to provide appropriate support.

Student Responsibilities

- Above all, you have the right to expect courtesy from your fellow students, and the same will be asked of you. Courtesy includes the expectation that everyone will come to class ready and willing to learn and to interact, and able to ask or answer questions freely. Courtesy also implies that you arrive on time and stay until the end of class.

- Attendance is required. Class attendance keeps you well connected to the course and to the members of your group. In physics courses, each new concept builds on earlier ones, so mastering key concepts is critical. If your schedule makes it difficult to attend class regularly and on-time, you shouldn’t take this course.

  The most common causes of missed classes are lack of sleep and time pressure from other obligations. If this happens to you, you need to seek out advice on how to set priorities and manage your time effectively.

  If you miss class, it’s your responsibility to find out what you missed. Talk to your groupmates, and notify them of your absence in advance if possible. They’re relying on you to be caught up by the time you return to class.

  You must prepare for class. Class time is valuable and limited. Using that time effectively requires that you’ve had some exposure to the necessary concepts, so that you can ask good questions and practice applying those concepts in class. Evidence from courses with this format suggests that the time you spend preparing for class significantly reduces the amount of time needed for homework. Finally, class discussion will not cover all of the assigned material.

- It’s your responsibility to show me what you do and don’t understand through your questions, so that I can help you learn. You help influence the pace of the course. Silent confusion benefits no one.
• I can’t emphasize enough the importance of homework! Just as with other areas of learning, your physics problem-solving skills will improve only by practicing regularly and conscientiously. You’ll get very little value out of homework if you procrastinate, or if you depend on the efforts of others. If you start to get behind, get help early before the problem gets worse!

• Ask for clarification on anything you find unclear, ambiguous, or unspecified. This includes both course policies and physics topics. Ignorance is never a valid excuse.