

PHYS 1312 Syllabus

University of Georgia, Fall 2021

Introduction

Welcome to Physics 1312! This is the second half of a two-semester introductory physics sequence, intended for prospective physics or astronomy majors (although not exclusively). 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.

Prerequisites

You should already be comfortable with college algebra, trigonometry, plane geometry, and both differential and integral calculus. You should also be well acquainted with basic science concepts such as scientific notation, significant figures, units and dimensions, and graphing. We will continue to do some computer modeling as a part of this course.

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: cwiegert@uga.edu
Office:	215 Physics Building	Phone: 706-363-3937
Class:	MWF Period 7 (3:00–3:50), 327 Physics Building	
Lab:	M Periods 9–10 (5:20–7:15), 319 Physics Building	
Final Exam:	Wednesday, 15 Dec, 3:30–6:30 pm, 327 Physics Building	
Office hours:	TBA	

Course Resources

Required Materials

- *Matter and Interactions II: Electric and Magnetic Interactions*, 4rd ed., by Chabay and Sherwood (Wiley). The text is also available in an e-book format; you will not need the WileyPLUS card.
- *Experiments for an Introductory Physics Course*, 2017 ed., Hayden-McNeil Publishing. This will be used in your lab section, and is the same manual as for the previous semester.
- A “clicker” account and app from Turning Technologies. 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.

Online Resources

- Online assignments are an essential part of the course. You will access them with an account on the LON-CAPA system at <https://spock.physast.uga.edu/>.
- The [eLearning Commons](#) will serve as another repository of course information: homework and exam solutions, grades, announcements, etc.

Academic Support

- Office hours are your chance to get free 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 email or talk to me to set up a time.
- 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:

- 23% Cumulative final exam
- 42% Three midterm exams (18%/14%/10% for highest/middle/lowest grades)
- 10% Homework grade
- 15% Laboratory grade
- 10% In-class activities: clickers, group work, etc.

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 it's 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 other measurements, grades can possess a small degree of uncertainty. Factors such as improvement, effort, and participation *may* help borderline grades. Lobbying, however, will not!

Exams

All in-class 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 eLC 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 all 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. Detailed solutions will be posted to eLC after each in-class exam.

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.

If you need to miss an exam for any reason, you must contact me before the exam if at all possible, or else as soon as possible after the exam. Make-up exams or alternate arrangements will be provided *only* for legitimate, documentable reasons and *only* if you notify me in a timely fashion. 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.*

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. Work each problem carefully and in detail; keep a notebook of your work for your own reference. Many problems will allow you to submit answers online, although some will be purely handwritten. Detailed solutions will be posted to eLC after the due date.

Written portions of assignments will be scanned and uploaded, to avoid the excessive collection of paper. Written work will be graded not just for the correctness of the end result, but for clarity and completeness of the entire problem-solving process.

Assignments will be weighted equally unless otherwise specified. I will drop your lowest two assignment percentages in calculating your overall score, *with the additional requirement* that you complete the course evaluation at the end of the semester. 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' write-ups; 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.

Reading Assignments

Regularly reading the textbook and working through its sample exercises is an *essential* part of your preparation for class. I don't expect you to understand everything in the textbook at first sight. However, your ability to learn *during* class will depend on having already encountered the material *prior* to class. You should jot down notes and questions as you read; this will help organize your class notes and will remind you to ask for clarification.

Class Activities

You will often be asked in class to answer conceptual and quantitative questions, both individually and in small groups, and often using the "clickers". Your responses will be graded primarily on participation, although correct responses will receive a small bonus. 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.

Course Policies

Academic Honesty

“I will be academically honest in all of my academic work and will not tolerate academic dishonesty of others.”

UGA has a comprehensive academic honesty policy, *A Culture of Honesty*, which is available from the Office of Instruction at <https://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 what’s acceptable, you are obligated to ask me for clarification.

I take issues of academic honesty very seriously, and it is my responsibility to uphold the University’s policy. This means, among other things, that I will report suspected incidents of dishonesty to the Office of Academic Honesty. Typical consequences of academic dishonesty can range from receiving a zero for that grade, to failing the course, to being suspended. Going through the academic honesty process is not usually a pleasant experience, as some of my students have discovered.

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.

Withdrawals/Incompletes

The [Undergraduate Bulletin](#) and the [Registrar’s Office](#) website describe the University policies regarding withdrawals and incompletes (<http://reg.uga.edu/policies/withdrawals>). If you don’t complete the initial required administrative tasks of the course (e.g., the questionnaire), 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 can help in situations where an unexpected event prevents you from completing a portion of the course (say, an exam or a few assignments). An Incomplete isn’t appropriate when a student has missed a large fraction of the course assessments, for whatever reason.

Student Distress and Mental Health

If you or someone you know needs assistance, or your course performance is significantly affected by issues beyond your control, I urge you to let me know and to contact [Student Care and Outreach](#) promptly. It is always easier to address these situations when you raise concerns as early as possible. Waiting until the end of the semester to take action may limit my ability to provide appropriate support.

UGA has several resources for students seeking [mental health services](#) or [crisis support](#). If you need help managing stress anxiety, relationships, etc., please visit [BeWellUGA](#) for a

list of *free* workshops, classes, mentoring, and health coaching led by licensed staff in the University Health Center. Additional resources can be accessed through the UGA app.

Technology Policy

Cell phones should be turned to silent during class, and should be put away except for when you are using them for clicker questions. Texting, checking email, posting to social media, etc., are not allowed during class. These activities are distracting and disrespectful to your fellow students. Tablet computers and convertible laptops in tablet mode may be used with a stylus *for the purpose of taking notes*. Typing notes on a traditional laptop is less effective for a class like this, because of the large number of diagrams, graphs, and equations required.

Student Responsibilities

- Above all, you have the responsibility to act courteously toward your classmates and the right to expect the same from others. Courtesy includes coming to class on time, ready and willing to learn and interact for the full period. It means asking questions, and helping the class with your own responses. It also means being supportive of others' mistakes, and comfortable making your own.
- It's your responsibility to show me what you do and don't understand through your questions in and out of class, so that I can help you learn. Silent confusion benefits no one.
- Attendance is required. Class attendance keeps you well connected to the course and to the other students in the class. 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 *do* happen to miss class, it's your responsibility to find out from other students what you missed. Talk to your classmates, 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* regularly read the textbook to prepare for class. Class time is valuable and limited. Using that time effectively requires that you've had some exposure to the necessary concepts through your reading, so that you can ask good questions and practice applying those concepts in class. Also, *class discussion will not cover all of the assigned material*.
- You're responsible for the material covered in assignments. 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 little or nothing 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.