

PHYS 1112 Syllabus

Introductory Physics – Optics, Electricity and Magnetism

CRN 27133

University of Georgia, Spring 2019

Instructor Information:

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Course Description

This course is the second half of a two-semester introductory sequence which will 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 would not be possible. We will develop a “toolbox” of techniques for solving problems involving these concepts and approach many topics from their historical theoretical and experimental advances.

The ordering of topics this semester will be different from the traditional sequence. We will start with optics, the study of light and how it interacts with matter. You will then learn about electric fields and electric potential and see how to apply those concepts to the study of currents (moving charges) and electric circuits. Finally, we will discuss the magnetic field and how electric and magnetic fields interact with each other. With any time remaining, we may touch on topics in modern physics.

As you know from the first semester of physics, this is a quantitative science. We will address the qualitative and conceptual aspects of electromagnetism, however, much of the work in this course involves mathematics, solving mathematical problems, and most importantly interpreting physical problems. You will be asked to communicate your understanding of the material in many ways – mathematically, graphically, visually. You are expected to have a working knowledge of college algebra, trigonometry, and basic geometry. In addition, concepts that you learned in the first semester physics (mechanics) like force, energy and torque will reappear in this course. You will continue to make use of Newton’s Laws as well as conservation laws. *Please let me know if you are concerned about your preparation for this course.*

This course also requires a laboratory component, PHYS 1112L, that will account for a portion of your grade (you sign up for the laboratory section separately). No course grade will be assigned until the laboratory requirement is completed. See the lab syllabus for more information: <http://www.physast.uga.edu/courses> .

If you are a physics, astronomy, or engineering major, or if you are considering those possibilities, then this course may not be for you. Please talk to Dr. Cooley (physics) or Dr. Caillault (astronomy) about other options.

Basic Class Information

- MWF 9:05-9:55 PM (Period 2) : Room 202 in the Physics Building
- Lab: 314 Physics Building or 116 Science Learning Center (Various times)
- Final Exam: Monday, May 6th : 7 – 10PM (location: TBA)
- Office Hours: TBA
- Office Location: Room 239 Physics Building

Required Course Materials

- *Physics*, vol. 2, 5th ed. by James S. Walker. You may use older editions if you wish, but you are responsible for knowing any content changes.
- Laboratory Manual: *Experiments for an Introductory Physics Course*, 2016 ed., Hayden-McNeil Publishing. This is the same manual used for the first semester of physics so you may not need to purchase another. Visit <https://www.physast.uga.edu/courses> for the lab syllabus.
- A *simple scientific calculator* for exams, which must be *non-programmable, non-graphing, and non-symbolic*. Calculator graphing, algebra-solving, or programming functions will NOT be permitted on the exams. Cellphones will not be allowed during exams. (A good rule of thumb is, if the calculator *isn't* allowed on the SAT, it's also *not* allowed for exams.)
- Homework assignments will be performed online and are necessary to develop understanding throughout the course. You will access them with an account on LON-CAPA at <http://spock.physast.uga.edu/>.
- Please check your *UGA email* daily. The UGA email system will be used (infrequently) for announcements.

Optional Course Resources

- A Turning Technologies ResponseCard NXT or QT Device (“clicker”). Bring it to every class; we will be using clickers throughout the semester for participatory activities (see section below regarding participation and clicker points). A Turning Technologies Account license is also required and instructions for setting up an account can be found at <http://wwwctl.uga.edu/turningpoint/students>.
- The eLearning Commons (<http://www.elc.uga.edu/>) will serve as a repository for homework solutions, grades, practice problems, and tutorials.
- *Tutoring*: Tutors are available either through the Academic Resource Center at Milledge Hall and Miller Learning Center or through the Department of Physics and Astronomy (<http://www.physast.uga.edu/tutors/>) or you can visit the Division of Academic Enhancement (<http://www.dae.uga.edu/tutoring>).
- If you cannot 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. For email correspondence, *include your class and time in the subject line*.

Grading Policy

Your overall grade will be weighted as follows:

- 25% Cumulative final exam grade
- 45% Three in-class exams
- 15% Laboratory grade
- 15% Homework grade

Letter grades will be assigned following:

A	93.0 – 100.0
A-	90.0 – 92.99
B+	86.0 – 89.99
B	83.0 – 85.99
B-	80.0 – 82.99
C+	76.0 – 79.99
C	73.0 – 75.99
C-	70.0 – 72.99
D	60.0 – 69.99
F	less than 60.0

Overall numerical grades will *not* be rounded (i.e. 89.99 is still a B+).

Regrade requests:

Any requests for a regrade of an assignment or an exam are under my discretion and 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 it may raise *or lower* your score. Arithmetic errors in adding up points will be handled separately. Regrade requests should be accompanied by all your work.

Withdrawal and Incomplete:

The Undergraduate Bulletin and the Registrar's Office website describe the University policies regarding withdrawals and incomplete (<http://reg.uga.edu/policies/withdrawals>). If you don't complete the initial required administrative tasks of the course (e.g. the questionnaire you may be withdrawn from the class). However, if you are demonstrably not attending class and completing work ("excessive absence") this is not justification for me to submit a withdrawal.

A grade of Incomplete is not appropriate for a student who has missed a large portion of the course assessments, for whatever reason.

The *Withdrawal Deadline* is March 21, 2019.

Exam Policy

There will be three in-class exams and a cumulative final exam. All exams are closed-book, closed-notes exams. The format of the exams will be discussed in class but will include qualitative as well as quantitative problems. There will be no make-up midterm exams; if you do not take an exam, you get a zero. However, if you miss a midterm exam for a *serious, documentable reason*, the grade of your final exam may be used to replace your lowest in-class exam score (this would make your final exam worth 40% of your grade). You must contact me as soon as you possible and submit documentation of your absence *within a week*. Do not simply presume that your situation or documentation merits an excused absence; that determination is not your prerogative. Make-up final exams will be given only for students with legitimate, documentable reasons and **MUST** be arrange **PRIOR** to the final exam.

You must bring a non-programmable calculator to each exam and be comfortable with its functions. If you bring a programmable calculator, you will be asked to exchange it for another that I will provide. A formula sheet ("toolbox") will be provided for each exam. This sheet will be updated and posted to the eLC for viewing before the exam day. The class should be familiar with the formulas before taking each exam.

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 in your best interest to attempt every problem and to show all of your work and thought processes in the exam answer area provided. An incorrect answer without any accompanying work will be given zero points. A correct answer without any work will not receive full credit.

Solutions:

Solutions to the exam will be posted on the eLC after every student has taken the exam.

Final Exam Scheduled Date: Monday, May 6th : 7 – 10 PM

Location: TBA

Homework Policy

Homework is an essential part of the learning and understanding physics. Working through problems enables you to practice problem solving techniques, apply the methods you learn in class, and recognize areas that you may struggle with the material. Homework assignments will be assigned weekly to keep up with the pace of the class and ensure you master the concepts before moving to the next.

Logistics:

Weekly problems sets will generally be due at **midnight (11:59 pm)** on **Fridays** online through the LON-CAPA system. Occasionally, the homework will require a written response to be handed directly to me or placed in my office mailbox (Room 201, **before 5 PM**). I *will not accept* written homework responses that are slid under my door. Responses will be graded for correctness, although for some problems, incorrect responses may earn partial credit. Your best preparation for the exams will be to complete the homework assignments. You can access the homework sets through <http://spock.physast.uga.edu> and login with your UGA ID. Each assignment will be weighted equally unless otherwise specified.

Dropping the lowest two:

*In the case that you **complete the online course evaluation** at the end of the semester, I will drop your two lowest homework grades. If you do not fill out the course evaluation, then all of your homework scores will be included in your average. The intent of this policy is to encourage you to fill out the evaluation, but also to compensate for unavoidable circumstances (e.g. illness, emergency, etc.). *Late problem sets will not be accepted or excused.**

Teamwork vs. Plagiarism

Working together with your fellow classmates is *strongly* encouraged. However, your goal should be to attempt every problem on your own and then turn to your classmates for a team effort, and not plagiarism. The answers you submit should be your own! Discussing physics is a great way to learn, but simply asking someone how they solved a certain problem is not effective, will not help you prepare for the individual exams, and is in fact a form of plagiarism. Copying from someone else's work, or other homework solutions, is a form of plagiarism and a violation of academic honesty policies. In addition, I understand that internet searches can provide you with solutions or help you to work through a problem, but *fundamentally understanding* the problem and the solution are key to being successful in this class. If you have read this far, enter "*ultima thule*" in the Additional Comments question of the introductory physics Google survey for one bonus percentage point applied to your first homework assignment. Don't discuss this with your classmates. Let's see if they read the syllabus thoroughly too.

Attendance and Reading Quiz Policy:

The reading assignments are your responsibility to read *before* you attend class and are listed on the course schedule. Your time spent in class will be much more meaningful and beneficial if you have viewed the material beforehand. The schedule contains the reading assignment for each week based on the topic that we will cover. We may have a short, multiple-choice quiz at the beginning of class using the “clickers”. I will *not* accept a written record of your responses as a clicker substitute.

During class, we will work through many example problems and discuss the solutions. You may be asked to present your activities to the class, turn them in for additional points that will be added to the clicker points total for that day, or answer numerical clicker questions. It is imperative that you bring a calculator to class each day and participate as these activities are designed to solidify your knowledge of the concepts or bring up any questions you may have about the material.

In addition, we will have several activities during class that will require the use of the “clickers”. Each clicker question is worth 2 points for a correct answer and 1 point for an incorrect answer. As a reward for your pre-class preparation and attentiveness in class, I will be giving a **bonus of 3 percentage points added to your FINAL CLASS GRADE if you answer 50% of all in class clicker questions correctly**. Any less than 50% correct will be scaled according using the rule that 50% => 3 points (so 43% correct would give you 2.58 points). It is in your best interest to attend class regularly and participate. Please note that this is enough to raise your grade from an A- to an A, a B- to a B, etc. Due to this policy, any requests for extra credit assignments or activities will be ignored!

I don't expect you to understand everything in the text. However, a good study tip is to outline the reading sections in anticipation for the material we will cover during class. You can also record any questions or clarifications you may need to bring up during class.

Labs

Labs begin the second week of classes, Jan 14 - 18. Attendance is mandatory. Please visit <https://www.physast.uga.edu/courses/> to read thoroughly the lab syllabus for the section in which you enrolled.

Technology Policy

During class, cellphones, iPads, iPods, and laptops need to be turned off or silenced. Devices that use a stylus are permitted for *note-taking purposes*. Standard laptops will not be useful for taking notes during class, due to the large number of diagrams, equations, and graphs required. Texting, checking email, Facebook, etc. can be distracting to you and those behind you. Please be respectful to your fellow students.

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 the [Office of Student Support Services](#). 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.

Academic Support

The Division of Academic Enhancement (DAE) offers free peer tutoring for some of UGA's most challenging courses. For courses, locations, and times, please visit the website listed below. In addition to peer tutoring, the DAE also provides Academic Coaching, Student Success Workshops and more. The DAE is committed to the success of all students at the University of Georgia. For more on these and other resources, please visit dae.uga.edu.

Academic Honesty

The University of Georgia has a comprehensive policy on academic honesty, described in a document entitled A Culture of Honesty. This document is available through the Office of the Vice President for Instruction or online at <https://ovpi.uga.edu/academic-honesty>. This policy covers all academic work.

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 my suspicions of dishonesty to the Office of the Vice President for Instruction. Typical consequences of cheating on homework or an exam range from receiving a zero for that grade, to failing the course.

Student Responsibilities

- You are responsible for all material: homework problems, assignments given in class, and assigned readings.
- You are responsible for all announcements made in class.
- Read the assigned portions of the textbook before class.
- Do all homework assignments.
- Attend ALL laboratory sessions in your assigned laboratory section.
- Know the University's policies concerning withdrawals and incompletes.
- Ask me if you do not understand **anything**. There is no dumb question.
- Physics is fun and everywhere!

The course syllabus is a general plan for the course; deviations announced to the class by the instructor may be necessary.

Tentative Class Schedule based on Chapters from Walker

Reading Assignments are given in preparation for the next class. Any modifications to this schedule will be announced during class. Be prepared for class by reading the assigned chapter before class.

Date	Class	Day of Week	Reading
9-Jan	1	W	25.1 - 3, 26.1 - 1
11-Jan	2	F	26.3
14-Jan	3	M	26.4 - 5
16-Jan	4	W	26.6 - 8
18-Jan	5	F	
21-Jan	6	M	NO CLASS
23-Jan	7	W	27.1 - 2
25-Jan	8	F	27.3 - 5
28-Jan	9	M	28.1 - 2
30-Jan	10	W	
1-Feb	11	F	28.3 - 4
4-Feb	12	M	
6-Feb	13	W	EXAM 1 - CH. 26, 27
8-Feb	14	F	19.1 - 2
11-Feb	15	M	19.2 - 3
13-Feb	16	W	19.4
15-Feb	17	F	19.5
18-Feb	18	M	
20-Feb	19	W	20.1 - 2
22-Feb	20	F	20.3 - 4
25-Feb	21	M	20.5
27-Feb	22	W	20.6
1-Mar	23	F	
4-Mar	24	M	
6-Mar	25	W	EXAM 2 - CH. 19, 20
8-Mar	26	F	21.1 - 4
11-Mar	27	M	NO CLASS
13-Mar	28	W	NO CLASS
15-Mar	29	F	NO CLASS
18-Mar	30	M	21.1 - 4
20-Mar	31	W	21.5 - 6
22-Mar	32	F	22.1 - 2
25-Mar	33	M	22.3 - 4
27-Mar	34	W	
29-Mar	35	F	
1-Apr	36	M	22.5 - 6
3-Apr	37	W	23.1 - 2
5-Apr	38	F	23.3 - 4

8-Apr	39	M	
10-Apr	40	W	22.7, 23.3 - 4
12-Apr	41	F	23.5 - 10
15-Apr	42	M	
17-Apr	43	W	EXAM 3 - CH. 22, 23
19-Apr	44	F	24.1 - 3
22-Apr	45	M	25.1 - 4
24-Apr	46	W	14.4 - 7
26-Apr	47	F	25.5
29-Apr	48	M	

Cumulative Final Exam: Monday, May 6th : 7 – 10PM (location: TBA)