PHYS 1252 Syllabus

Introductory Studio Physics for Engineers II

CRN 45297

University of Georgia, Spring 2019

Instructor Information:

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Course Description

Welcome to Physics 1252! This course is the second half of a two-semester calculus-based, studio mode 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 would not be possible.

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 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 solid working knowledge of college algebra, trigonometry, and plane geometry.

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 Class Information

- Classroom: 145 Science Learning Center (SLC)
- T 9:30-12:15 PM (Periods 2&3), R 9:30-10:45 AM (Period 2)
- Final Exam: Monday, May 6th : 7 – 10PM (location: TBA)
- Office Hours: TBA
- Office Location: Room 239 Physics Building / Room 119-A SLC (TR only)

Required Course Materials

- FlipItPhysics: Electricity and Magnetism, by Gladding, Selen, and Stelzer (Macmillan). As bundled in the bookstore, this is an online resource system combined with the textbook Physics for Scientists and Engineers, Vol. 2, latest edition, by Tipler and Mosca. Use the course access key **a2653bed** to enroll online in FlipItPhysics (www.flipitphysics.com). You will use this material primarily to prepare for class.
- 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://www.ctl.uga.edu/turningpoint/students.
- 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.

Online Course Resources

- Please check your *UGA email* daily. The UGA email system will be used (infrequently) for announcements.
- The eLearning Commons (http://www.elc.uga.edu/) will serve as a repository for homework solutions, grades, practice problems, tutorials and announcements.
- 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/.

Optional Course Resources

- *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/). You can also visit the Department of Academic Enhancement at http://dae.uga.edu/tutoring/.
- Office Hours are your chance to either get one-on-one help or help from a small group of students in my office. Examples of questions that I usually encounter during office hours include (but are certainly not limited to) homework, exams, or concepts covered during class. If you cannot come to my regularly scheduled office hours or need additional help, please set up an appointment with me *via email*.

Grading Policy

Your overall grade will be weighted as follows:

20%	Cumulative final exam grade
45%	Three in-class exams (20% / 15% / 10% for highest/middle/lowest grades)
15%	Laboratory grade
10%	Homework grade
5%	Pre-class preparation
5%	In-class participation grade

Letter grades will be assigned following:

A	90.0 – 100.0
A-	87.5 – 89.99
B+	85.0 – 87.49
B	80.0 – 84.99
B-	78.5 – 79.99
C+	75.0 – 78.49
C	70.0 – 74.99
C-	67.5 – 69.99
D	60.0 – 67.49
F	less than 60.0

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), or are demonstrably not attending class and completing work, you may be withdrawn from the class for "excessive absence".

If you are considering withdrawing from the course, you should discuss your choice with me beforehand. In many cases, students are not doing as poorly as they think.

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 conceptual as well as problem-solving questions. 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 will be provided for each exam. This sheet will be

updated and posted to the ELC for viewing before the exam day. You should familiarize yourself with the formulas before taking each exam.

Unless told otherwise, you must show your work on each problem in order to receive full credit. Therefore, it is in your best interest 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.

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 35% of your grade). You must contact me as soon as possible (before the exam if possible) and submit documentation of your absence *within a week*. This policy is designed to handle unavoidable situations like medical or family emergencies, or previously scheduled academic or athletic events. 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.

Solutions:
Solutions to the exam will be posted on the ELC after the exams have been returned to the students unless otherwise announced in class.

Final Exam Scheduled Date: Monday, May 6th : 7 – 10PM
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:
There will problem sets through the LON-CAPA system and will require you to submit your answers online. Occasionally, there may be additional assignments that require a written response to be handed directly to me or placed in my office mailbox (**before 4 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. *Late problem sets will not be accepted or excused.* However, even if you miss the deadline for an assignment to receive credit, you should still make the effort to complete the assignment as the homework is a good way to prepare for the exams.

Dropping the lowest two:
Homework assignments will be weighted equally. *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.).

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 point percentage point applied to your final in-class participation grade. Don't discuss this with your classmates. Let's see if they read the syllabus thoroughly too.

Class Preparation

Pre-class lecture video viewing FlipItPhysics (http://flipitphysics.com) and the textbook reading assignments 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 questions using the clicker technology based on the preparation material to gauge your understanding. 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. The checkpoints during the FlipItPhysics lectures will allow to record any questions or clarifications that you would like during class.

Attendance and In-Class Policy:

You will often be asked in class to work on conceptual and quantitative questions, both individually and in small groups. Some of these activities during class will require the use of 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.

During in-class activities, no off-task use of cellphones, iPads, iPods, or other electronic communication devices are permitted in the classroom. We have a limited amount of time in class and it is detrimental to spend it distracted. In addition, you and/or your group will be asked to present some of the material in the activity as learning from your peers is more beneficial than recitation from a teacher.

In-Class Groups

Class groups will initially be chosen at random, but groups will be reassigned several times throughout the semester (usually following the exams). Group work is integral to the studio format, and it is important that you work efficiently with your group mates. It is also important that you meet and interact with everyone in the class. Consider this preparation for your future careers in which will be need to work with new people and be productive. This studio physics course is a perfect opportunity to be exposed to discussing and processing different viewpoints in an academic environment.

Labs

Lab activities will usually take place during the longer class period on Tuesdays, although you might also perform small "mini-labs" during other class times. Lab work is a group effort; your group will hand in one report to be graded as a team. Because teamwork is important to the success of labs, *there are no make-up labs.* 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 lab grade. At the end of the semester, *provided that you complete the evaluation of your fellow groupmates*, I will drop your lowest lab assignment percentage in calculating your overall score. If you don't submit a team evaluation during the allotted time, then all of your lab grades will count towards your final grade.

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, graphs, and physical problem solving. Texting, checking email, Facebook, etc. can be distracting to you and those behind you or around you (see In-Class Policy section of the syllabus).

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 (http://sco.uga.edu/). 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 (http://dae.uga.edu) (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 (honesty.uga.edu). 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 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 interact.
- You are responsible for all material: homework problems, assignments given in class, assigned readings. The emphasis on the importance of homework cannot be overstated as it will significantly improve your problem solving skills.
- **You *must* prepare for class**. Class time is valuable and limits. 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.
- You are responsible for all announcements made in class.
- Attendance is required.
- Ask me if you do not understand **anything.** There is no dumb question. You help influence the pace of the course and silent confusion benefits no one.
- You are responsible for asking for clarification on anything that is unclear with regards to coursework or course policies.

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

Tentative Class Schedule

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	Comments	Reading Topic/Pre-lecture Topic
10-Jan	1	R		Ch. 30.4, Ch. 20.4, Ch. 15.5
15-Jan	2	T	Intro. Physics Survey	Ch. 31.1 – 3
17-Jan	3	R		Ch. 31.5
22-Jan	4	T	Lab 15 Exercise	Ch. 32.2
24-Jan	5	R		Ch. 32.1
29-Jan	6	T	Lab 16 Exercise	Ch. 32.3 – 4
31-Jan	7	R		
5-Feb	8	T	**EXAM 1 - CH. 15/39 (Doppler effect), 31, 32**	Ch. 33.1
7-Feb	9	R		Ch. 33.3
12-Feb	10	T	Lab 17 Exercise part 1	Ch. 33.4
14-Feb	11	R		Ch. 31.4
19-Feb	12	T	Lab 18 Exercise	Ch. 21.1 – 3
21-Feb	13	R		Ch. 21.4 – 6
26-Feb	14	T	**Double Period**	Ch. 23.1 – 2, 6
28-Feb	15	R		
5-Mar	16	T	*Midterm,* **EXAM 2 - CH. 33, 21, 22**	Ch. 23.3 – 5
7-Mar	17	R		Ch. 24. 1 – 5
12-Mar	18	T	***NO CLASS***	***SPRING BREAK***
14-Mar	19	R	***NO CLASS***	***SPRING BREAK***
19-Mar	20	T	Lab 12 Exercise	Ch. 25.1 – 2
21-Mar	21	R	*Withdrawal Deadline*	Ch. 25.3 – 4
26-Mar	22	T	**Double Period**	
28-Mar	23	R		Ch. 25.5
2-Apr	24	T	Lab 13 Exercise part 1	Ch. 25.6
4-Apr	25	R		Ch. 26.1, Ch. 27.1 – 2
9-Apr	26	T	Lab 13 Exercise part 2	Ch. 26.2 – 3
11-Apr	27	R		
16-Apr	28	T	**Exam 3 - CH. 23, 24, 25**	Ch. 27.5, Ch.28.1 – 2, 4
18-Apr	29	R		Ch. 28. 3, 5
23-Apr	30	T	Lab 14 Exercise	Ch. 28. 6 – 7
25-Apr	31	R		Ch. 28.8
30-Apr	32	T	**Double Period**	Ch. 29.1 - 3

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