

Physics 214: General Physics II

Instructor: Dr. Itai Seggev (dök' • tər ē • tī' sě' • gěv)

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1 Contact Information

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Office Hours: Thursdays 3:00-5:00. “Office Hours” means that I promise I will be there and will give you priority over students from my other courses. You are welcome to make an appointment or to drop by my office anytime, with the understanding that I may be busy.

2 Course Goals

Welcome to General Physics II! This course continues the exploration of basic principles of physics—started in General Physics I—with a view towards applications to the life sciences and related fields. In this semester, we will focus on wave and electromagnetic phenomena (including optics). Specific course goals include the following:

1. improving deductive reasoning skills;
2. developing an appreciation for physics and its applications to many sciences, especially life sciences, as well as everyday life;
3. understanding the unity of electromagnetic phenomena, despite apparent disparity;
4. mastering the concept of phase and applying it to wave problems; and
5. learning basic concepts covered on the MCAT examination.

This is a course which many students find very challenging. Please don't lose heart! I am confident that if you put in the effort you will be able to excel.

3 Executive Summary

The course meets MWF 9:00 AM – 9:50 AM in Lewis 101. The course will be as interactive as possible and will include group work and electronic polling on questions. Missed in-class assignments will result in a grade of zero, so come to class on-time and prepared. Lecture will not simply repeat material covered in the text. You will likely get little out of class if you fail to keep up with the reading assignments.

Daily homework will consist of on-line assignments accessible at the course website:
<http://edugen.wiley.com/edugen/class/cls32078/>

Online homework will exclusively cover new material. In addition to problems, you will be expected to contribute a question on the new material to the message boards on Blackboard. Your textbook should have included a registration code necessary to access the Wiley Plus site. It is your responsibility to log in *daily* and keep up with what is posted. If you have any problems with the site you should let me know **immediately**. In addition to the daily homework, there will be *weekly* assignments due each Friday submitted on paper.

3.1 Grade Breakdown

The course grade will be based on the following formula:

- Group Work (20%)
- Daily Homework (12.5%)
- Weekly Homework (12.5%)
- Individual Quizzes (5%)
- Midterms (10% each)
- Final Exam (20%)

3.2 Textbook

The textbook for this course is *Introductory Physics: Building Understanding* by Jerrold Touger. We will cover most of the material in chapters 14–28. The course website has a large number of supplements. These include interactive examples, video demonstrations, and solutions to select problems. You are strongly encouraged to make use of these resources.

Bundled with the textbook is a second text, *Biomedical Applications of Introductory Physics*, a “clicker” that allows the class to vote electronically (much like on TV), and an access code to Wiley Plus, the course website. You will need all of these, and this bundle provides a significant savings. *Do not buy a used book*. You will end up paying more once you purchase all the needed ancillaries.

3.3 Clickers

As noted above, your textbook came bundled with an interwriteTM PRS clicker. This is an “IR” type clicker, not the “RF” type clicker used in some biology and chemistry courses. Once you have purchased your textbook and clicker you will need to log on to Blackboard (not the Wiley Plus site!) and register its ID. (This is done by clicking on the course, clicking on Tools in the side bar, and then following the on-screen instructions.) The ID is the six-digit number on the back of the actual clicker device. Registration only needs to be done once; you do not need to do this again if you’ve already done it for another class.

Note: You must register your clicker on Blackboard no later than 11pm on Sunday, January 21, or you will lose 20% of your quiz grade.

Clickers will be used primarily for promoting in-class discussion—you will be graded on whether or not you voted, not the correctness of your answer. There will also be some in-class clicker quizzes which will be graded. The quizzes will be clearly distinguished from the normal “discussion questions”.

4 Detailed Policies

4.1 Attendance

There is no attendance policy as such. However, there are many in-class assignments, such as group work and clicker quizzes, which cannot be made up. If you will miss class because of an academic or athletic event, you should notify me and bring documentation ahead of time. If you are ill, you will need to notify me (via email is fine) as soon as possible and bring a doctor's note when you return to class. For these excused absences, you will not be penalized.

4.2 Group Work

I will assign work groups of about five. Most classes will feature at least some group work, and you will typically be asked to turn in a record of your work. Some of these assignments, especially "Group Quizzes" and "Case Studies", will be graded on correctness and be worth more points. For each class period, each group should appoint a "secretary" who will record the discussion and/or write up the solution as appropriate for that assignment. This single record should be turned in, with the group number, the members in attendance, and the members absent. Everyone in the group (in attendance) will receive the same grade for that period. It is therefore imperative that everyone in the group agrees to and understands the group answer. If I ask an individual to discuss the group problem, and that person cannot provide an answer, the grade of the whole group will suffer.

Team members will be asked to evaluate each other on attendance, attentiveness, preparation, and participation. Negative evaluations may impact an individual's grade. My own observations of your level of participation may also impact your group work grade. I will do my best to mediate any group conflicts or help dysfunctional groups. If you have concerns, you should feel free to approach me. However, ultimately it is the group's responsibility to work through any problems.

4.3 Participation

Not only coming to lecture but actively participating in it are a vital part of this class. Everyone learns best when they are actively engaged in the lesson. This is especially true in physics class, which deals with concepts which can seem a little foreign at first. You should come prepared with your clicker, calculator, the current chapter of in the book, and anything else you may need to participate. Ask questions if you get lost. My goal is to teach you, not spend fifty minutes confusing you. Demonstrating your involvement by asking questions or volunteering answers (or guesses) can only help both your learning and your grade.

4.4 Homework

Homework assignments are your best opportunity for working out confusions and mastering the material. While you are encouraged to discuss problems with your classmates, **your submission must be your own!** Moreover, you are strongly encouraged to spend

some time (at least 15 to 20 minutes) on each problem by yourself before seeking help. It is much easier to understand a solution than to come up with one—as will become evident when you take the first test.

Online homework will be due at midnight before the next class. The problems will exclusively cover new material. Thus, you will need to do the assigned reading in order to complete the daily homework. The goal is to familiarize you somewhat with the material before class discussion, but I do want you to take them seriously. Therefore the grades will be curved to 70%. Most of the online problems assigned are “algorithmic”, meaning the numbers in the problem are different for each student. Thus, copying answers from a friend is unlikely to work.

Weekly homework must be turned in at the beginning of class on the date it is due to receive full credit. Under no circumstances can homework be accepted for credit once solutions have been posted, which will usually be the evening on the day they are due. Athletes and other individuals who may be absent should turn in their homework early or contact me ahead of time to make alternate arrangements. One weekly homework grade will be dropped.

Weekly homework will feature more conceptual or complex problems than the daily homework. You will therefore be expected to fully explain your work in English as well as equations, and you will be graded on usage and presentation in addition to content. In order to receive full credit, you must (a) name the physical principle(s) you are using, (b) explain why they are relevant, (c) and how you transformed the word problem into equations. In addition, you must draw a free-body diagram (when appropriate) and solve symbolically for the answer before plugging in numbers. See the check list “The Care and Feeding of a Physics Problem Set” for all the details.

4.5 Exams

There will be three midterm examinations, roughly during the 5th, 9th, and 13th week of the semester. The final exam will be at 8:00am on Monday, May 7. Barring a documentable emergency (e.g., being hospitalized), **you must contact me well in advance of the exam in order for me to consider providing any sort of makeup**. For the final no accommodation is possible unless *required* by University regulation. In particular, **purchasing an airline ticket that forces you to leave before the end of finals week is not grounds for taking the exam at another time**. All tests will be in-class, closed-note, and closed-book. You will, however, be provided with a formula list shortly before the exam. Exam grades will be curved on a case-by-case basis.

4.6 Final Overall Grades

I go through the following process in determining final grades:

1. I compute everyone’s overall average according to the formula given in section 3.1. I *may* also do an overall curve.
2. Starting with the standard 90/80/70/60 ABCD scale, I adjust this scale (usually downward) so that it coincides with gaps in the grade distribution. This a way, a few points

do not make a difference in the overall grade.

3. Finally, I examine each student's grade individually. If I see a noticeable improvement or I am aware of extraordinary circumstances (extended illness, getting a concussion the night before the midterm, etc.), I *may* adjust the grade. Students who have excellent attendance and who I see making the maximum effort will get the greatest benefit during this step.

4.7 Academic Dishonesty

I will generally trust that you will observe the guidelines above regarding collaboration and that you will be academically honest. However, any case of academic dishonesty will be reported to the University (in keeping with University regulations) and dealt with harshly. Please bear in mind the following:

1. Any instance of cheating on an exam or copying homework solutions out of a solutions manual (whether online or in print) will result in an automatic failing grade for the course.
2. Since class attendance as recorded by the PRS system feeds directly into your grade, giving your clicker to another student is a form of cheating. If I notice more clickers going off than there are students in the room, I will stop class and take attendance. Those involved will receive an automatic failing grade in the course.
3. As indicated above, your homework must reflect your own work. Finding a joint solution with a collaborator and then each person copying that common solution is strictly prohibited. On the other hand, going home and each person writing up a solution on his or her own after working together to solve a problem is perfectly acceptable. While this difference might be a fine line, it will help you gain a better grasp of the material.

5 Finally

Doing physics involves both learning concepts and mastering problem solving. These are distinct skills, but they interact with and support each other. Remember that solving a problem is not necessarily a linear process; wrong turns and dead ends are often instructive. You will often find that you read the book and somewhat understand a concept. If you then do a problem, that concept may become clearer, and reading the book a second time will then result in a deeper understanding. Do not be afraid to do practice problems and reread the book as many times as necessary—it will eventually all come together.