

Physics 2020: General Physics II, Spring 2016

Classes: MWF 3-3:50 PM (Lecture 100) in Duane G1B30

Lectures: Prof. Steven Pollock (Steven.Pollock at Colorado.edu)
Office: Duane F1013 (10th floor, tower) Phone: (303)-492-2495
Office hours: Before&after class every day (up front) for "quick questions" W1 PM in Help Room, Mon after lecture (first up front, then behind the stage, then the helproom), Friday after lecture (same deal), or any time by appointment.
And, other times by app't, or "electronic office hours" by email. Use Piazza for questions!

Labs/ Prof. Michael Calkins (Michael.Calkins at Colorado.edu)
Recitation: Office: Duane F715 (7th floor, tower) Phone: (303) 735-4853
Office hours: We 10:00-12 (Help Room) *Private* office hours Thur 12-1 in my office.
And, any other times by app't, or "electronic office hours" by email

Course Web Site: <http://www.colorado.edu/physics/phys2020>
Lots of additional information and updates will be posted there. Check it often!
Grades and solutions will be available on our D2L site: <http://learn.colorado.edu>

Text: ***Physics: Principles with Applications, 6th Ed, D. Giancoli (Pearson, Prentice Hall), starting in Chapter 16.*** (Earlier editions, e.g. the 5th, should work ok too)
There are many excellent introductory physics books. Giancoli's is one of the best. Others can be found on reserve at the Gemmill Library. Prentice Hall maintains a great web site with resources for each chapter (Linked from the course web page).

Physics 2020 is the second semester of an algebra-based sequence in college physics. We emphasize *conceptual understanding* and problem solving skills. We will cover topics in modern physics, including electricity, magnetism, light, optics, and more: the foundations of our technological society. Our goals are for you to continue developing knowledge and intuition about how the world works, to learn to approach physics problems on both qualitative and quantitative levels, to relate classroom physics to the *real world* you live in, and to develop a deeper appreciation of the scientific method. We want you to learn to understand everyday phenomena of electricity and magnetism in terms of just a few basic and understandable physical laws.

This material largely involves discoveries less than 150 years old. (Of course, even the ancients knew some things about magnetism and light). We are so comfortable with technologies like TV and computers, it's easy to forget just how recent these developments are: some of you may have relatives old enough to remember the days before radio (the first licensed broadcast station opened in 1920). We live radically more convenient and perhaps longer and more enjoyable lives due to the revolution in electric-based technology. Modern health-care, industrial, and home tools are based on the existence of electrical power and electronics. By the end of this course, you should have a base of knowledge to allow you to better understand how many modern electronic devices work.

Any information in this syllabus is as accurate as possible at the time of writing. Announcements about changes of any kind will be made in class, and posted on the web, and will take precedence over this syllabus. You are responsible for what is said in class, whether or not you are in attendance.

College level logic, enthusiasm, and curiosity will be helpful too!

Reading: *is an essential part of PHYS 2020!* Reading the text before class is *very important*. We will assume you have done the required readings in advance!
Reading assignments will appear at each lecture (and on the course web page).

Grading: The grade weighting will be as follows:

3 Midterms (each): 12%

Final exam: 24%

Lab: 15% (of which 1/3 is prelab)

CAPA: 15%

Written homework: 10%

Clickers/online surveys/piazza contributions: Minor extra credit, see below.

Note: If you miss more than 1 required lab or the final, you can't receive a passing course grade!

Participation and Clickers: We will use clickers during lectures, to help you learn the material. You need to purchase an "iClicker" from the bookstore. Get the correct type! (iClicker - Radio Frequency Classroom Response System). Your iClicker responses count only as *bonus* (extra credit) points: they (along with a few other extra credit opportunities) REDUCE midterm weight by up to a max of 14% of midterm exam total (i.e. 5% of course grade). Generally, correct answers are worth 3 pts (participation is 2 pt). We give you full clicker credit for the 3 days with your lowest scores, to accommodate dead batteries, sore throats, broken alarm clocks, and fresh powder. Please register your iClicker at www.colorado.edu/its/cuclickers/students/register.html

There may ALSO be occasional online surveys which add in to this extra credit, stay tuned on our D2L page. We also give a small amount of extra credit for contributing to ongoing discussions on the Piazza page.

Exams: There will be three midterms and a final:

Midterm 1: Thursday, Feb 11 7:30 - 9:15 pm, rooms TBA

Midterm 2: Thursday, Mar 10 7:30 - 9:15 pm

Midterm 3: Thursday, Apr 14 7:30 - 9:15 pm

Final: Thurs, May 5 7:30 AM-10 AM

You are allowed to bring a single 8.5" x 11" formula sheet to each exam. You can write anything you want on your formula sheet (both sides!) but you must write it by hand - no photocopying, typing or sharing allowed. Calculators with scientific notation are allowed and sometimes needed. (Of course, no phones, internet access, "electronic crib sheets", etc!)

It is your responsibility to make sure you have no conflicts with these exams!

If you have a conflict, you should retake Physics 2020 in a semester when you can make it to all the exams. If you are absent for a serious medical reason, or with prior approval from Prof. Pollock or Prof. Calkins, you may be excused from 1 midterm. Medical excuses must be submitted no later than 1 week following the exam. *There are no makeup exams.*

Students with disabilities, including non-visible disabilities, or other conflicts or issues must let us know early in the semester (first two weeks) so that your academic needs may be appropriately met. Students with religious obligations that conflict with the exam dates should contact us early in the semester (first two weeks) so that accommodations can be made. (Details below)

personalized homework (everyone's is slightly different!) with a new CAPA ID # each week. The ID # is printed on *your* assignment (or use the "PIN-Getter" link). Log onto CAPA to submit answers. *Work out your solutions on paper first!* One advantage of CAPA is instant feedback on how you're doing. Also, you get the opportunity to change wrong answers *without penalty*. You get multiple tries (5) on each problem, with *no* points off for wrong answers. If you get it wrong 5 times, that particular problem is "closed out" but you can still work on others. You can log off and return any time, there is no time limit except CAPA is due Wed at 11 PM. (With an automatic extension to Th@8 AM, which is an absolute deadline.) *Late entries after that will not be accepted by CAPA* (solutions will be available!) Problems? - check the CAPA help page first!

Written Homework: In addition to weekly CAPA there is a longer, more in-depth homework due Friday at 3 PM. Hand these in to the TA boxes by the entrance to the Help Room. They will be handed back during lab. *You are encouraged to work together on homework, but in the end, you are responsible for generating your own solutions and understanding.*

Preflights/surveys: Some weeks there may be an optional (extra credit) online survey. It's due Wed night (hard deadline Thurs@8 AM). It's useful to us and you, please participate!

Labs/Recitations: There is a 2-hour recitation or lab each week in Duane G2B88.

You must attend the recitation *to which you are assigned!* Missed labs should be made up *the same week*, though there will be opportunities to make up *excused* lab absences at other times in the semester. *Complete your pre-lab homework before start of your lab section and turn it in to your TA upon entering the lab.* The pre-lab contributes 1/3, and the lab 2/3, to your total lab/recitation grade. **If you miss more than 1 lab, you can't pass the course!**

Physics Help Room: The lecturers and TAs will have regular office hours in the Help Room (Duane G2B87), open from 9AM-5PM Mon-Fri. Times when specific TAs will be in the Help Room are posted on the Help Room schedule (see link on our web site), but you can drop by anytime. If you need to see your TA privately, contact them directly.

Lecture Notes and Solutions: Lecture Notes and solutions of the in-class concept tests, written homework and exams will generally be posted on D2L and/or the course web site.

Etiquette: Please turn off all phones when entering class. It is perfectly OK to interrupt the lecture by yelling "Question!", questions are good! We encourage collaboration, an essential skill in all professions. Social interactions are critical to scientists' success - most good ideas grow out of discussions with colleagues. As you study, help your partners get over confusions, ask each other questions, constructively critique ideas. You learn the most from *teaching* others! Remember that this is about *learning*, not about passing a class - for all assignments, *the work you turn in must be your own: in your own words, reflecting your own understanding.*

Piazza: We have a site at www.piazza.com. If you have questions, post them HERE first, rather than emailing us right away. You will get an invitational email, please sign up. (I have used them for several years, and nobody has complained of getting spammed) This provides a nice place to ask questions which YOU can also respond to. We will be looking at it, and will try to respond, but our hope is that you can help each other. Please don't make it a "cheat site", (don't tell the **answer** to homework problems) but you can certainly share your ideas, point people to helpful pages in the book, give hints, etc - just like any good instructor would in the help room! We give token extra credit if you actively participate in this forum.

Incompletes: Rules of the University require that grades of incomplete (I) may be assigned only if “for reasons beyond the student’s control, the student is unable to complete the course requirements.” “I” requests must be made in person to Prof. Pollock or Prof. Calkins.

Disabilities: Students with disabilities, including non-visible disabilities, **please let us know early in the semester (first two weeks)** so that your academic needs may be appropriately met. You will need to provide documentation from the Disability Services Office in Willard 322 (phone 303-492-8671), email dsinfo@colorado.edu, or visit www.colorado.edu/disabilityservices

Religious Holidays: We will make a strong effort to reasonably and fairly deal with all students who, because of religious obligations, have conflicts with exams, assignments or required attendance. Please send an e-mail to the instructor **in the first week of classes** if you anticipate a conflict. See www.colorado.edu/policies/fac_relig.html

CU Behavior Policy: Students and faculty each have responsibility for maintaining an appropriate learning environment. We have the professional responsibility to treat all students with understanding, dignity and respect, to guide classroom discussion and to set reasonable limits on the manner in which they and their students express opinions. Professional courtesy and sensitivity are always important. Class rosters are provided to us with your legal name. We will gladly honor your request to address you by an alternate name or gender pronoun. Please advise us of this preference early in the semester. See www.colorado.edu/policies/classbehavior.html and www.colorado.edu/studentaffairs/judicialaffairs/code.html#student_code

Honor Code: We trust every individual in this class to understand and follow the CU honor code. Please respect that trust! It's a large class, and we realize there may be some temptations - we'll do our best to make the class valuable and worthy of your honorable behavior! The honor code at CU is very cool, although the CU official wording about it is a little tough. Violations of the honor code may include: cheating, plagiarism, aid of academic dishonesty, fabrication, lying, bribery, and threatening behavior. All incidents of academic misconduct shall be reported to the Honor Code Council (303-725-2273). Students who are found to be in violation of the academic integrity policy will be subject to both academic sanctions and non-academic sanctions (including but not limited to university probation, suspension, or expulsion). Other information on the Honor Code can be found at www.colorado.edu/policies/honor.html and at www.colorado.edu/academics/honorcode.

Discrimination: CU policies on Discrimination and Harassment, Sexual Harassment, or Amorous Relationships apply to all students, staff and faculty. Anyone who believes s/he has been the subject of discrimination or harassment based upon race, color, national origin, sex, age, disability, religion, sexual orientation, or veteran status should contact the Office of Discrimination and Harassment (ODH) at 303-492-2127 or the Office of Judicial Affairs at 303-492-5550. (www.colorado.edu/policies/discrimination.html), Information about the ODH and the campus resources available to assist individuals regarding discrimination or harassment can be obtained at www.colorado.edu/odh.

The course topics that we will cover in Physics 2020 are among the greatest intellectual achievements of humans. Don't be surprised if you have to think hard and work hard to master the material. You can perform very well in this class if you follow this time-tested system:

- Read the chapter material before lecture and recitation/lab. If you read it first, it'll sink in faster during lecture. We won't repeat what's in the book - especially definitions. Class is for making sense of what's in the text!
- Take notes on your reading and try to write down questions you may have. If you ask those questions in class, we will try to answer them.
- Come to class. Stay involved in class and labs. Participate, engage! Come to office hours at the Physics Help Room.
- Start the homeworks early. Give yourself the time to work and understand. Remember that it's possible to have a perfect homework score by putting in the time and effort.
- But first: Do the reading. Don't try the homework until you finish the reading.
- Work together. Physicists often work in groups. You need to do your own thinking, but talking to others is a great way to sort out your thoughts.
- Check out our general guide to Problem Solving Strategies.
- Don't get behind. It's very hard to catch up.
- Don't skip anything. Every stone rests on another, and the whole building will collapse if any are missing.
- Please, get help early if you feel you are struggling with any aspect of the course (from your TA/LA/Prof. Pollock or Calkins/help room/study group/tutor...). We're here to help!
- Don't give up! You can make total sense of all this stuff - it just may take some effort.

Being "good" at physics problem solving comes from practice. CAPA problems usually involve two steps: a decision about which principles and concepts of physics apply, and then a determination of the answer (which usually involves a calculation). Long answer HW and labs concentrate even more on the principles and concepts, and your ability to explain what you are doing. We encourage you to talk about physics with your friends. The thing to talk about is not which number to put where (the calculation is the easy part), but the reasoning that helps you decide what to do with the numbers.