Physics 2020: General Physics II, Fall 2010

Classes: MWF 11-11:50 AM (Lecture 100) in Duane G1B20

Lectures: Prof. Steven Pollock (Email: Steven.Pollock at Colorado.edu)
Office: Duane F1013 (10th floor, tower) Phone: (303)-492-2495
Office hours (tentative): After class every day (up front) for "quick questions"
Mon and Fri after class I will move to the Help Room until at least 1 PM.
Administrative-type office hours: Wed after the lecture in my office
And, any other times by app't, or "electronic office hours" by email

Labs/ Recitation: Prof. Oliver DeWolfe (Email: Oliver.DeWolfe at Colorado.edu)
Office: Duane F327(3rd floor, tower) Phone: (303) 492-3272
Office hours (tentative): Mon & Thur 10-11 AM in the Help Room
Administrative type office hours: Wed 10-11 AM 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!

Text: ***Physics: Principles with Applications, 6th Ed*, D. Giancoli**
(Pearson, Prentice Hall), Starting in Chapter 16
There are many excellent introductory physics books. Giancoli's is one of the best. Others can be found on reserve at the Math/Physics 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.

Prereqs: General Physics I, some basic algebra, geometry and trigonometry.
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 surves: Extra credit, see below.
Note: If you miss more than 2 labs, 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 REDUCE exam weight by up to a max of 14% of midterm exam total (i.e. 5% of course grade). Generally, correct answers are worth 2 pts (participation is 1 pt). Clickers start counting the 2nd week of class. We also 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 be occasional online surveys which can also add extra credit, stay tuned.)

Exams: There will be three midterms and a final:

Midterm 1:	Tuesday, Sep 21	7:30 - 9:15 pm, location TBA (but likely G1B30?)
Midterm 2:	Tuesday, Oct 19	7:30 - 9:15 pm
Midterm 3:	Tuesday, Nov 16	7:30 - 9:15 pm
Final:	Tuesday, Dec 14	7:30 PM-10 PM, location TBA!

You may bring a single side of 8.5 in. x 11 in. paper for the first exam, with your own handwritten notes. We will let you add one more side for each exam (i.e. one side for Midterm1, two sides for Midterm2 etc.) 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. DeWolfe, 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)

CAPA Homework: (Computer Assisted Physics Assignments) You will receive a weekly printed personalized homework assignment (every student's assignment is slightly different) with a CAPA ID # which changes each week. The ID number is printed on your personal assignment (or use the "PIN-Getter" link). You log onto CAPA to "hand in" your answers. *Work out your solutions on paper before you log on.* One advantage of CAPA is the instant feedback on how well you are doing. Also, you get the opportunity to change wrong answers without penalty. You get multiple tries, generally 5, on each problem, with *no* points taken off for wrong answers. If you get it wrong all 5 times, that particular problem is "closed out" but you can still work on others. You can log off and come back later any time, there is no time limit except the final deadline. CAPA will generally be due Mon at midnight (the week after Spring Break: Tues at midnight). There is an automatic extension until Tues morning at 8 AM, which is an absolute deadline. *Late entries after that will not be accepted by CAPA* (solutions will be available!) If you have problems of any kind please check the CAPA help page first.

Written Homework: In addition to the weekly CAPA sets, there will be a longer, more in-depth homework assignment due on Thursdays at 5PM. These should be handed in to the TA boxes by the entrance to the Help Room. They will be graded by your TA and handed back during your lab session. We won't have one *every* week (e.g. exam weeks we'll give you a break!) *You are encouraged to work together on the homework, but in the end, you are responsible for generating your own solutions and understanding.* Do not fall into the trap of working with a group where others routinely provide solutions; you will have tremendous difficulty on the exams which you must take alone.

Labs/Recitations: There is a 2-hour recitation or lab each week in Duane G2B88.
Please note: you must attend the recitation to which you are assigned!
Missed labs must 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. See the Labs/Recitations link on our web site fordetails about pre-labs, grading, and making up missed labs. **If you miss more than 2 labs, 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 CULearn and/or the course web site.

Etiquette: Please turn off all phones when entering any class. Please don't throw vegetables at the instructor. It is perfectly OK to interrupt the lecture by yelling "Question!", questions are good! We encourage collaboration in this course, 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 together, 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.*

And, the fine print:

Incompletes: Rules of the University require that grades of incomplete (IF) may be assigned only if *"for reasons beyond the student's control, the student is unable to complete the course requirements."* IF requests must be made in person to Prof. Pollock or Prof. DeWolfe.

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), or *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*.

How to succeed in this course:

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 DeWolfe/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.