

Physics 7320

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The grader is Charlie Stahl (`Charles.Stahl@colorado.edu`).

The class meets MWF 1:25 to 2:15 in Duane G125.

Office hours Wednesday –2:15-4 or 5 (depending on whether there's a colloquium at 4) and Thursday–1 to 5, plus other times when you can find me.

Grade:

- homework 250
- midterm 100
- final 150
- total 500 points

The midterm will be in the evening, 1 1/2 hours long, in mid March. The final is Monday 6 May, 4:30-7 in our classroom.

Homework will typically be given out on Wednesdays, due Fridays 10 days later. The questions will also be posted on

- <http://www-hep.colorado.edu/~degrand/p7320.html>

The grader will probably be marking papers over the weekend and I will want to post solutions at some reasonable time after the Friday deadline, so keep to a schedule and negotiate with me IN ADVANCE if you feel you have to turn in something late. Otherwise, we may not take late homework. Homework solutions will be scanned onto the course web page, as usual.

Text: Jackson, “Classical electrodynamics.”

Books I like and will try to put on reserve in the Math-Physics library include

- Landau and Lifshitz, “Classical theory of fields”
- Landau and Lifshitz, “Electrodynamics of continuous media”
- Ryder, “Quantum Field Theory” – very useful when we start doing classical relativistic field theory. The book seems rather plain when you first open it, but the discussion of its topics are usually quite clear.
- Low, “Classical Field Theory”
- Born and Wolfe, “Optics” – a remarkable book. It dates from the late 50's, but has been frequently updated. Its discussion of diffraction is fairly complete and is a good contrast to Jackson's. It's not an easy read.

- Thorne and Blandford, “Modern Classical Physics.” A sprawling and somewhat unfocussed treatment of the parts of classical physics which the authors (a general relativist and an astrophysicist) are interested in. The parts of the book that will make good backup reading for 7320 are chapter 2 (special relativity) and chapters 8-9 (diffraction and related topics). You could spend years working through all 1500 pages!

Also, I put links on the web page to four items

- “How light interacts with matter,” by V. F. Weisskopf. This is nontechnical but very deep. It’s worth reading twice: once at the start of the term and then after we have finished the radiation section of the course.
- My sophomore-level special relativity notes. We will do special relativity at a much higher level than these notes, but they might be a good refresher. The genesis was that about ten years ago I taught our sophomore modern physics course and realized that I did not understand anything which was written in the elementary texts I read (even though I use relativity in my research). So I wrote up what I thought was important.
- I also put a link to Einstein’s original 1905 article.
- There is a link to my graduate quantum mechanics notes. If I end up talking about the quantum electromagnetic field, this is as close as I can get to what I will say. See Ch. 14. Ch. 12, semiclassical radiation theory, might also be useful.

Finally, if you qualify for accommodations because of a disability, see me as soon as possible but before the second week of class.

Required stuff:

Classroom Behavior Students and faculty are responsible for maintaining an appropriate learning environment in all instructional settings, whether in person, remote, or online. Failure to adhere to such behavioral standards may be subject to discipline. Professional courtesy and sensitivity are especially important with respect to individuals and topics dealing with race, color, national origin, sex, pregnancy, age, disability, creed, religion, sexual orientation, gender identity, gender expression, veteran status, political affiliation, or political philosophy.

For more information, see the classroom behavior policy, the Student Code of Conduct, and the Office of Institutional Equity and Compliance.

Requirements for Infectious Disease

Members of the CU Boulder community and visitors to campus must follow university, department, and building health and safety requirements and all applicable campus policies and public health guidelines to reduce the risk of spreading infectious diseases. If public health conditions require, the university

may also invoke related requirements for student conduct and disability accommodation that will apply to this class. If you feel ill and think you might have COVID-19 or if you have tested positive for COVID-19, please stay home and follow the guidance of the Centers for Disease Control and Prevention (CDC) for isolation and testing. If you have been in close contact with someone who has COVID-19 but do not have any symptoms and have not tested positive for COVID-19, you do not need to stay home but should follow the guidance of the CDC for masking and testing.

Accommodation for Disabilities, Temporary Medical Conditions, and Medical Isolation

If you qualify for accommodations because of a disability, please submit your accommodation letter from Disability Services to your faculty member in a timely manner so that your needs can be addressed. Disability Services determines accommodations based on documented disabilities in the academic environment. Information on requesting accommodations is located on the Disability Services website. Contact Disability Services at 303-492-8671 or dsinfo@colorado.edu for further assistance. If you have a temporary medical condition, see Temporary Medical Conditions on the Disability Services website. If you have a required medical isolation for which you require adjustment, Faculty: insert your procedure here for students to alert you about absence due to illness, injury, or medical isolation. Because of FERPA student privacy laws, do not require students to state the nature of their illness when alerting you. Do not require "doctor's notes" for classes missed due to illness; campus health services no longer provide "doctor's notes" or appointment verifications.

Preferred Student Names and Pronouns

CU Boulder recognizes that students' legal information doesn't always align with how they identify. Students may update their preferred names and pronouns via the student portal; those preferred names and pronouns are listed on instructors' class rosters. In the absence of such updates, the name that appears on the class roster is the student's legal name.

Honor Code

All students enrolled in a University of Colorado Boulder course are responsible for knowing and adhering to the Honor Code. Violations of the Honor Code may include but are not limited to: plagiarism (including use of paper writing services or technology [such as essay bots]), cheating, fabrication, lying, bribery, threat, unauthorized access to academic materials, clicker fraud, submitting the same or similar work in more than one course without permission from all course instructors involved, and aiding academic dishonesty. All incidents of academic misconduct will be reported to Student Conduct & Conflict Resolution: honor-colorado.edu, 303-492-5550. Students found responsible for violating the Honor Code will be assigned resolution outcomes from the Student Conduct & Conflict Resolution as well as be subject to academic sanctions from the faculty member. Visit Honor Code for more information on the academic integrity policy.

Sexual Misconduct, Discrimination, Harassment and/or Related Retaliation

CU Boulder is committed to fostering an inclusive and welcoming learning, working, and living environment. University policy prohibits protected-class discrimination and harassment, sexual misconduct (harassment, exploitation, and assault), intimate partner violence (dating or domestic violence), stalking, and related retaliation by or against members of our community on- and off-campus. These behaviors harm individuals and our community. The Office of Institutional Equity and Compliance (OIEC) addresses these concerns, and individuals who have been subjected to misconduct can contact OIEC at 303-492-2127 or email cureport@colorado.edu. Information about university policies, reporting options, and support resources can be found on the OIEC website. Please know that faculty and graduate instructors must inform OIEC when they are made aware of incidents related to these policies regardless of when or where something occurred. This is to ensure that individuals impacted receive outreach from OIEC about resolution options and support resources. To learn more about reporting and support for a variety of concerns, visit the [Don't Ignore It](#) page.

Religious Accommodations

Campus policy requires faculty to provide reasonable accommodations for students who, because of religious obligations, have conflicts with scheduled exams, assignments or required attendance. Please communicate the need for a religious accommodation in a timely manner. In this class, Faculty: insert your procedures here. We'll figure something out. See the campus policy regarding religious observances for full details. Mental Health and Wellness Faculty: The following is a recommended syllabus statement but not required. The University of Colorado Boulder is committed to the well-being of all students. If you are struggling with personal stressors, mental health or substance use concerns that are impacting academic or daily life, please contact Counseling and Psychiatric Services (CAPS) located in C4C or call (303) 492-2277, 24/7.

Free and unlimited telehealth is also available through Academic Live Care. The Academic Live Care site also provides information about additional wellness services on campus that are available to students.