

Physics Department
University of California, Berkeley
Physics 7C, Spring 2016

INSTRUCTOR: Achilles D. Speliotopoulos
EMAIL: ads@berkeley.edu

OFFICE: 386 LeConte
OFFICE HRS: Tu 03:30 – 4:30PM
Th 9:30 - 11:30AM

LECTURE TIMES: TuTh 08:00 – 09:30AM

LOCATION: 4 LeConte

HEAD GSI: Zachery Stone
EMAIL: stone@berkeley.edu

LOCATION:
OFFICE:
OFFICE HRS:

TEXTBOOK:

D. C. Giancoli, *Physics for Scientists and Engineers*, custom edition for the University of California, Berkeley. ISBN: 978-0-558-22904-7.

P. A. Tipler and R. A. Llewellyn, *Modern Physics*, 6th edition, W. H. Freeman and Company, ISBN: 978-1-4292-5078

WebAssign: www.webassign.net

INTRODUCTION:

We will be covering electromagnetic waves, physical optics, special relativity, and quantum physics in Physics 7C. This is a wide and diverse range of topics, which presents unique issues in both teaching and planning the course. Indeed, the course can be thought to be consisting of the following three distinct parts:

- Light and optics (~ 5 weeks)
- Special Relativity (~ 3 weeks)
- Quantum Physics and its applications. (~ 6 weeks)

And it is because of this division of the course that we will be using two different text books.

For the first third of the course—where the focus will be on electromagnetic waves, and their interaction with matter—we will be using five chapters from the third volume of the Giancoli's textbook that was used in Physics 7A and 7B. These five chapters traditionally represent the end of classical physics and the beginning of modern physics. For the rest of the course, we will focus on what is generally referred to as modern physics: special relativity, and quantum theory. In this part of the course we will be using the textbook by Tipler and Llewellyn. The presentation in this textbook is more detailed, and at a deeper level than what is presented in Giancoli. It does mean, however, that we will have two different textbooks for the class (from two different publishers), and is the main reason that we will be using WebAssign—which is not affiliated with any one publisher—for the online homework instead of Mastering Physics—which is affiliated solely with Pearson publishing.

EXAMINATIONS:

There are three examination schedules for the course: Two midterms and one final exam. These exams and quizzes are designed to assess your *understanding* of physics, as opposed to your

knowledge of the subject. As such, you will be asked to solve problems that you have never seen or even encountered before, either in your reading or in the homework.

The dates and times for the three exams for the course have already been scheduled for the course. The midterms will be held two hour block during the times listed below.

Midterm 1: Tuesday, February 23, 07:00PM – 09:00PM, Location: VLSB 2050

Review Session: Saturday, February 20, 02:00PMM-4:00PM, Location: GBP

Midterm 2: Tuesday, April 5, 07:00PM – 9:00PM, Location VLSB 2050

Review Session: Saturday, April 4, 02:00PMM-4:00PM, Location: GBP

Final Exam: Thursday, May 12, 7:00PM – 10:00PM, Location TBA

Please mark these days down now. The midterms and the final cannot be made up if you miss one! You must take the final exam to pass the course.

In Physics 7A and 7B it was often possible to make accommodations when scheduling conflicts for the evening midterms occurred; students in one lecture section were allowed to take the midterm in another section when they happened. There is only one section of Physics 7C, however. ***As such, we cannot make accommodations for scheduling conflicts for Physics 7C, and all students necessarily must take their midterms on the scheduled day.***

EVALUATION OF STUDENT PERFORMANCE:

Your performance in this class will be evaluated based on the following:

Discussion	3%
Laboratory	5%
Homework	12%
Midterm #1	20%
Midterm #2	20%
Final	40%

We will follow Department of Physics guidelines for lower division courses in determining your final grade in the class.

HOMEWORK POLICY:

Physics is a subject learned by doing, and at this level, that means doing homework. Indeed, it is difficult to over-emphasize how important it is to do the homework set assigned each week.

Homework will be assigned every Friday, and will be due by 05:00PM the following Friday. ***It will consist of two parts.***

The first part is a written homework. It also will be due at 5:00PM on Fridays in a dropbox inside of the physics reading room, 251 LeConte. ***One of the problems*** will be chosen at random from this written homework that will then be graded by your GSI. The combined score from both the online homework and the written homework will make up your homework grade for that week.

Your solutions for these homework problems are written for an audience of one: the grader. Just as it is for exam problems, *if your GSI cannot understand **how** you arrive at your answer, you will not receive full credit for it even if your final answer is correct.* We reward understanding, not answers, and if we cannot read your handwriting or follow your logic, then we cannot assess understanding and therefore cannot give you credit for the problem. As such, make sure that your solutions are written clearly, on lined or white paper, with a logical progression from beginning to end.

We do realize that solutions to the homework problems can be found online; the Head GSI can google solutions as easily as the students can. We strongly discourage you from doing so. Not only is *copying the solution from online sources and presenting it as your own is an act of plagiarism and thus academic dishonesty*, the purpose of the homework is to help you learn the material and the process of arriving at the solution of a homework problem by oneself is a major part of this learning process. Very little is learned if the student looks at the solutions, and this will be reflected in their performance on the midterms and final.

In addition, there seems to be a prevailing attitude that if I find a solution to a homework problem on the internet, it *must* be correct. This is not true. There are posted solutions that are at best incomplete without the essential physics explained, and at worst just plain wrong.

The second part will be online, and will be done on WebAssign. While in Physics 7A and 7B we used Masteringphysics to do homework assignments, Physics 7C uses two different books as opposed to only one in Physics 7A and 7B, and from two different publishers, and that necessitates the use of WebAssign instead. The web address for WebAssign is <https://www.webassign.net/v4.html>. Please visit this site, and as you do so, note the following:

- A set of slides (both in powerpoint and in pdf) introducing students to WebAssign, and telling you how to log in is on the bSpace site under Resources/WebAssign.
- For your initial login, use your SID as your username and password, and "berkeley" as the institution; though, if you've used WebAssign before with your SID as the username, your old password is probably still in effect. Please create a new password immediately after you logged in! If you have trouble logging in, contact the Head GSI as soon as possible.
- You are allowed five attempts for each open ended question in the problem set.
- Numerical answers must be given to three significant figures unless noted otherwise.
- All students get different numbers, so copying numerical answers will not be effective. It is recommended that you log in early in the week to get your own assignment with your own numbers.
- If you submit partial solutions, you'll use up one of your three attempts.
- Each WebAssign problem has a corresponding problem in one of the textbooks.
- Solutions to the homework sets will be posted each week after the homework is due.

Late homeworks are not allowed. However, the lowest homework scores will be dropped.

DISCUSSION SECTIONS:

Discussion sections in Physics 7C are scheduled for only one hour. In addition, on the weeks when no laboratories are scheduled, the three hour laboratory section will also serve as a discussion session. Your attendance/participation during these one- and three-hour discussion sessions will contribute to 3% of your final grade in the course. These discussion sessions you will have an opportunity to ask about homework questions, as well as work through additional

problems in much the same way that problems on worksheets were done during discussion/laboratory sessions in Physics 7A and 7B. These problems will be posted in advance in Resources/DiscussionProblems. Although the problems may be difficult, it is the thought process and effort that will mostly be taken into account. ***In addition, just like in Physics 7A and 7B, the concepts covered, and level of difficulty of these weekly discussion problems may appear on exams.***

LABORATORY SECTIONS:

Unlike Physics 7A and 7B, laboratory sessions in Physics 7C are three hours long. ***There are, however, only seven labs during the semester, and laboratory sessions only meet during these seven weeks.*** Your scores on these labs contributes to up to 5% of your final grade. The dates on which these laboratory sessions are held are given in the course schedule. Please write these dates down now. ***You are required to complete all the labs in the course; you may not drop any labs.*** In addition, please note the following:

- With the exception of the last lab, if you miss a lab for any reason, you are allowed to make it up no later than the *following lab week*. ***You will not be able to make up the last lab, however.***
- Lab manuals are available at the Bancroft/ Telegraph Copy Central. You must get a lab manual for the course
- You must finish the pre-lab questions for a given experiment *before* the lab session. GSIs will be collecting the answers at the beginning of each lab session. The pre-lab problems for each experiment are located towards the beginning of that experiment's chapter in the lab manual. **Pre-labs count for half the points for the lab!**
- Lab write-ups are due by the end of the lab period, and should be no longer than 3 pages. Longer ones may receive deductions. **Write neatly.**
- On the lab write ups, please put your name and SID number on each page. On the front page of the write up, write your name, SID number, lab number, date, and your e-mail, lab section number and GSI. If you did your lab in a section other than your own, also write the lab section number, and GSI of that lab on your lab write-up.
- In grading lab reports, GSIs will adhere to the following rubric. This rebric will be applied separately for the lab and the prelab:

Score out of 5	Metric
5	Student shows mastery of material and answers all questions
4	Student shows good understanding, minor calculational mistakes.
3	Student shows good understanding of material with minor flaws, or omits one or two small parts in the writeup
2	Student shows working understanding, but with notable flaws; or, omits one or two large parts in the writeup
1	Student shows heavily flawed understanding of material, or omits a significant fraction of the writeup
0	Student did little or no work.

- If you absolutely cannot make your scheduled lab, you must attend an alternate session no later than the following *lab week* to complete the lab. When making up a lab please do the following:

- Notify the GSI of your assigned lab section that you cannot attend that section. Give him the reason as well.
 - Find a lab session with open slots that fits your schedule.
 - Notify the GSI of the lab you wish to attend that you will be showing up.
 - After completing the lab, give your write-up to the GSI whose lab you are attending, unless you have made other arrangements with your usual GSI.
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- *Please note that material from the laboratories may appear on exams.*