University of California, Berkeley
Department of Physics
Physics 5A Course Information Sheet, Fall 2017

Lecture 1 Instructor	Lecture Info	Instructor Office Hours
Achilles Speliotopoulos	Tu, Th 9:30 – 11:00AM	Wed, 11:00AM – 12:00PM
Office: 386 LeConte	2 LeConte	Th, 11:00AM – 12:00PM
Email: ads@berkeley.edu		

Waitlist: Because this is a lecture only class, we will try to accommodate as many students as we can on the waitlist.

Enrollment Changes: All enrollment changes must be made online. You must attend your enrolled DL section.

Drop Deadline: ***Friday, September 22, Midnight.*** Please drop the course on Tele-Bears immediately if you decide not to take it.

Graduate Student Instructors:

Siva Darbha (siva.darbha@berkeley.edu), for Sections 103 and 104
Yimu Bao (baoyimu@gmail.com), for Sections 101 and 103

GSI Office Hours and Location:

Siva Darbha: Tue 5-6, Th 4-5 in 109, 107, or 105 LeC
Yimu Bao: Wed 2-3, Fri 10-11, in 105 LeC

5A Course Center: N/A

Course Webpage: bcourses.berkeley.edu

Prerequisites: MATH 1A is a prerequisite. MATH 1B should be taken concurrently.

Introduction: While a relatively new course, Physics 5A has had a long history with this department. The course evolved out of Physics H7A, the first semester of the honors physics sequence corresponding to Physics 7A. Previous to that, Physics H7A evolved from Physics H5A in the 1980s when the university switched from the semester to the quarter systems. Nevertheless, the content of Physics 5A has not changed from Physics H7A, the biggest difference being that the laboratory components of the Physics H7 series has been converted to two stand laboratory classes, Physics 5BL and 5CL. In fact, we will be using the same textbooks as were used in Physics 7A.

While the content of Physics 5A is similar to Physics 7A, the class is geared more towards students who are interested in majoring in physics, astrophysics, engineering physics, or other similar disciplines. To better prepare these students for upper division classes, the use of calculus, vector algebra, and mathematics in general *as it is applied to understanding the physical world* will be emphasized. Indeed, the textbooks for this not only encourages this, it requires it.

The first chapter of Kleppner and Kolenkow immediately describes the motion of particles in terms of paths in three-dimensional space. You should be aware of this, and review the relevant areas of mathematics that you find necessary as soon as you can. While I will be emphasizing the physics that lies behind the mathematics, I will make use of the mathematics from the beginning to construct the framework needed to

describe the physics we will be learning. In fact, there are mathematical techniques that will be useful to understand material introduced later in the semester, and I will introduce them as needed.

Texts:

- D. Kleppner and R. Kolenkow, *An Introduction to Mechanics*. We will cover Chapters 1-5 and 7-10, including many of the sections marked "Optional." We will also be covering much of the material covered in Chapters 12-14 and will likely be assigned problems from these sections, but this material may be covered in a different order or a different way from what is presented in the textbook. You will generally be expected to read the sections of the book relevant to a given lecture before class. This is a **required** text.

- A. P. French, *Vibrations and Waves*. We will cover Chapters 1-5, including many of the sections marked optional. You will generally be expected to read the sections of the book relevant to a given lecture before class. This is a **required** text.

Exams and grades: There will be two midterm examinations and a final exam. The midterms will be given during class on the dates listed below, while the final examination is scheduled by the university and will be given at the date and time listed below. Exams cannot be rescheduled and must be taken at the scheduled time.

Midterm 1, Tuesday, October 3
Midterm 2, Tuesday, November 7
Final, Wednesday, December 13, 11:30AM - 2:30PM

If you are participating in a university sponsored activity such as athletics or if you have a religious conflict with any of the examination dates, you much contact us at least two week beforehand to arrange for other accommodations. Please note that this class is graded on a curve, and as such it is not possible to give a make up examination after an examination has been given.

Grades will be determined from a weighting of all the elements of the course approximately as follows:

1st midterm exam 20%
2nd midterm exam 20 %
Final exam 40 %
Homework 20%

A grade of "Incomplete" will only be given under dire circumstances beyond a student's control, and only when work already completed is of at least C quality.

Homework: Physics is a subject learned by doing, and at the level of Physics 5A, this means doing physics problems. Working on homework problems is critical to your learning the course material. Each Friday you will be assigned a problem set consisting of approximately 10 problems of varying difficulty. Some of these problems will be from the textbook, others will not be. The homework assignments will be posted on our bcourse site. They are to be turned into a homework box in **XXX** the following Friday by 5PM. The only exceptions are Friday, November 10 and Friday, November 24. Any homework assignment assigned that week will be due the following Monday.

Your solutions for these homework problems are written for an audience of one: the grader. Just as it is for exam problems, *if the reader 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 GSIs can google solutions as easily as the students can. We strongly discourage you from doing do. 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.

Late homework will not be accepted. We will, however, drop your lowest homework score. The lowest-homework drop is designed to cover normal circumstances such as illness, family emergencies, etc.

Discussion/Laboratory (DL) Sections: DL sections meet twice a week, each time for one hour.

Accommodations: If you need disability-related accommodations in this class, if you have emergency medical information you wish to share with the instructor, or if you need special arrangements in case the building must be evacuated, please inform Dr. Speliotopoulos immediately. Please see him after class or arrange to meet him at his office.

If you are in trouble (behind in homework, doing worse in the course than you would like, etc.) for whatever reason, please let us know. We'll try to help! Additional help is available through the Student Learning Center (Golden Bear Center), the Honors Society, the Society of Physics Students, and the Physics Scholars Program. Inquire in the Physics Department Undergraduate Student Services Office (368 LeConte Hall) for further information. **There is quite a lot of material in this course, and not a lot of time to learn it. There are many resources available to help you. We strongly encourage you to take advantage of them.**

Intellectual Honesty: The student body of UC Berkeley has adopted the following honor code. "As a member of the UC Berkeley community, I act with honesty, integrity, and respect for others." The hope and expectation is that you will adhere to this code.

Collaboration and Independence: Reviewing lecture and reading materials, working practice problems, and studying for exams can be enjoyable and enriching things to do with fellow students. This is recommended. However, when you submit an answer to assignments to your GSI, you are stating that the answer/solution is your own work and not copied from a book, website, friend, or other animate or inanimate source.

Cheating: A good lifetime strategy is always to act in such a way that no one would ever imagine that you would even consider cheating. Anyone caught cheating on an exam in this course will receive a failing grade on the relevant exam problem(s), and will also be reported to the University Center for Student Conduct. In order to guarantee that you are not suspected of cheating, please keep your eyes on your own materials and do not converse with others during the exams. If you must look in a direction other than your exam paper, we recommend looking up at the ceiling.

Plagiarism: To copy text or ideas from another source without appropriate reference is plagiarism and will result in a failing grade for your assignment and usually further disciplinary action. This includes copying homework solutions from printed or online, published or unpublished sources.

Academic Integrity and Ethics: Cheating on exams and plagiarism are two common examples of dishonest, unethical behavior. Honesty and integrity are of great importance in all facets of life. They help to build a sense of self-confidence, and are key to building trust within relationships, whether personal or professional. There is no tolerance for dishonesty in the academic world, for it undermines what we are dedicated to doing – furthering knowledge for the benefit of humanity.

Your experience as a student at UC Berkeley is hopefully fueled by passion for learning and replete with fulfilling activities. And we also appreciate that being a student may be stressful. There may be times when there is temptation to engage in some kind of cheating in order to improve a grade or otherwise advance your career. This could be as blatant as having someone else sit for you in an exam, or submitting a written assignment that has been copied from another source. And it could be as subtle as glancing at a fellow student's exam when you are unsure of an answer to a question and are looking for some confirmation. One might do any of these things and potentially not get caught. However, if you cheat, no matter how much you may have learned in this class, you have failed to learn perhaps the most important lesson of all.

Note: All above provisions listed in the course info sheet are subject to change at the instructor's discretion. Changes may happen to address problems and to improve the smooth running of the class and/or discussion sections.