

Physics 5A/5L Syllabus, Fall 2006

Mechanics is one of the most satisfying fields of physics, and the most susceptible to hands-on experimentation without fancy equipment. Some of your intuitions about moving bodies are probably wrong right now, but our goal is NOT to teach you to ignore your intuition and blindly follow equations – we want to bend and train your intuition so that the equations are no longer arbitrary to you but, instead, become intuitively obvious reflections of your own understanding. Our approach will be based on your taking an unusual level of responsibility for your own learning – I will be here to guide you, fill in the gaps and challenge your understanding, but not to present the material to you from scratch. Your introduction to the material will come through reading the text by Giancoli, which I believe is the best available and has been newly chosen this year for the 5 series. If you're having trouble, you might also want to look at the text by Knight, which is used for the 6 series and is on reserve in the library. It assumes less preparation and has longer explanations.

Lectures: MWF, 11:00am - 12:10pm

Instructor: David Smith, 321 Nat. Sci. II, 9-2183, dsmith@scipp.ucsc.edu

IMPORTANT: DO NOT use this email for submitting pre-class “warmup” homework (see below). Use it ONLY for specific business (arranging appointments, etc.)

Smith office hours: Monday 1:30-2:30, Wednesday 12:30-1:30 and by appointment

Discussion TA: Marty Tysanner

Discussion hours: Tu 12:30-2:00pm in ISB 221; Th 5:30-7:00pm in a room TBA

TA office hours: SEE COURSE WEBSITE

Required materials:

Physics for Scientists and Engineers by Giancoli (3rd edition, 2000) --
any version being sold at Bay Tree, or see me if you're not certain.

Physics 5L Lab Manual (available at the Bay Tree Bookstore)

Special blank laboratory notebook (available at the Bay Tree Bookstore)

PRS electronic student response unit (“clicker”) (available at Bay Tree)

Course website: <http://polaris.deas.harvard.edu/galileo/students/?courseID=1197>

This will contain important announcements, course handouts in Adobe Acrobat (pdf) format, homework assignments, and a course discussion group, and will be your place for submitting pre-class “warmup” assignments. **Be sure to register yourself and your PRS “clicker” at this site immediately.**

Course grading: Written homework: 15%, warmups: 5%, class participation (clickers) 5%, 2 midterms: 20% each, final: 35%.

Usual curve: Roughly 15% in the A range, 30% in the B range, 40% in the C range, and 15% in the D/F range (among those who take the final). This is an estimate, not a promise.

Syllabus – midterm dates in parentheses

Wk.	Dates	Topics	Chapter	Homework*	Lab
0	Septemb. 22	Measurement	1	none	none
1	Sep 25, 27, 29	1D Kinematics, vectors	2, 3	#1, due 9/29	none
2	Oct 2, 4, 6	2D Kin., Projectiles	3	#2, due 10/6	Kinematics
3	Oct 9, 11, 13	Dynamics I	4	#3, due 10/13	Dynamics
4	Oct 16, (18), 20	Dynamics II, Work	5, 7	#4, due 10/23!	Oscilloscope
5	Oct 23, 25, 27	Work, Energy	7, 8	#5, due 10/27	Energy 1
6	Oct 30, Nov 1, 3	Momentum, Collisions	9	#6, due 11/3	Energy 2
7	Nov 6, (8), 10	Rotation I	10	#7, due 11/13!	none
8	Nov 13, 15, 17	Rotation II	11	#8, due 11/17	Rotation 1
9	Nov 20, 22, ---	Statics	12	#9, due 11/27!	none
10	Nov 27, 29, Dec 1	Oscillations, Review	14	#10, due 12/1	Rotation 2

Exams: midterms will be given in lecture on October 18 and November 8, both Wednesdays. Exams are closed-book, with no notes and no calculators – but I will provide you a sheet containing all the equations you need, plus some you don't. There may be a second room -- pay attention in lecture and on the webpage for where to go. The final exam will be three hours long and held during finals week -- room and time TBA. Each exam will include one of the past homework problems, with only minor changes. This is both an opportunity to get some relatively easy points and an encouragement to take the homework assignments seriously. My exams are often difficult, but I generally curve them to get a reasonable grade distribution. Makeup exams will be allowed only in cases of documented medical or family emergency. For things that are known in advance (weddings, surgery appointments) see me early -- do not wait until the exam date is near or has passed.

Homework: Is due at the START of lecture, either on Friday or Monday (see above). **Late homework is not accepted.** Not every problem will be graded, but over the course of the quarter this should average out. Your solutions will be graded on clarity as well as correctness. In addition to the written homework, there will be an online “warmup” assignment at the web page above due at 9pm the night before each lecture. This will require you to have read an assigned part of the text *before* the lecture which will cover that material. The purpose will be to find out what you most need help with so I can concentrate on that in lecture. I will not read every single one of these, but I will try to read as many as possible and reply personally on some occasions. If you have something important to tell me, send me email, do not put important messages into the online assignments.

Lectures: Lecture is not intended to introduce you to the material. You will have that introduction in your reading. Lecture is intended to address difficulties that you encounter in your reading and working of problems. We will discuss questions that emphasize qualitative understanding, using the warmup assignment (see above) as well as new questions. The format will be very interactive, using both traditional discussion and electronic surveys of the class using Personal Response System (PRS) "clickers". Occasionally, I will replace one or more warmup questions with a request for problems that you would like me to work out on the board.

Problems which are from the same sections in the text as assigned problems (but not the assigned problems themselves) are fair game. You may not suggest a problem without trying to solve it first.

Lab course (5L): The lab course is graded and passed separately from 5A, although they are designed to work together pedagogically. Read through the experiment before you arrive. This is useful for you, of course, but mainly it's unfair to your lab partner for you to come in with no preparation. If you miss one lab, you cannot get higher than a B in 5L. If you miss two, you will fail the lab course (not 5A), and have to take it again. If you know in advance that you will miss a lab, arrange to make it up in another section. If you miss one unexpectedly, and there is another meeting later in the week, crash that session and make it up then. Please be neat, clear, and complete in your lab writeups and homework solutions. Someday you may have to grade some.

Succeeding in 5A: We're here to help you, but you have to take primary responsibility for making sure you learn the material. There are a lot of tools available to you, and the homework is probably the most important. We strongly encourage you to discuss the problems with other students, but sit down to write out your final answers alone. There is no quick and easy way to do well in a physics course. If you're not spending 10 hours a week outside the classroom on homework, reading, and other problem-solving, do not expect to pass. Please take advantage of discussion section, my office hours, and the TAs' office hours for help. The lab TAs are here to help with every aspect of the course during office hours, including homework. You may come to any TA's hours for help, not just your own. **Come to us early if you're getting worried:** your grade is determined entirely by your numerical scores, so there's nothing we can do to change it after the fact – we can only work with you so that you'll do better on the final. Feel free to ask me to schedule extra office hours with you if you can't make the posted ones or feel you are in particular trouble; I'm happy to do it.

This class will be considerably harder than 6A, because we are treating everyone in it as a future physicist, and want to give you the best and deepest grounding we can. If you're just trying to get a requirement out of the way and are allowed by your department to take the 6 series, please consider it (6 isn't easy by any means, but it will be easier than 5).

One aspect of physics – particularly the way we want future physicists to learn it – is that it consists of applying basic principles in new and unfamiliar situations. Thus, you will be facing problems on the exams that will look unfamiliar to you. We will do what we can to get you used to this, since it's important, including giving you practice exams. But I also recommend you find a study partner with whom you can practice making up exams for each other.

Modified Supplemental Instruction: In addition to discussion, we are also having support from the MSI program on campus. The MSI tutor will be scheduling the sessions during our first meeting of lecture. I encourage you to take advantage of this, particularly if you find you are having trouble in the course.

Academic dishonesty policy: Use of any aid in the exams not specifically allowed, including notes, or any copying during exams or consulting another person, will result either in an F in the course or a D grade with a statement in your evaluation that the grade was due to cheating, at my discretion. The latter is worse. Homework assignments which appear to us to be copied will be considered academic dishonesty and will result in penalties up to failing the course. These penalties are in addition to any administrative penalties from your college, such as expulsion, and are subject to the usual campus procedures.