

Physics Department, California State Polytechnic University, Pomona



Physics 102

Section 1

Spring 2001

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Course Description: Physics 102—Fundamentals of Physics—is an introduction to the subject matter of physics, a discipline that asks *the* most fundamental scientific questions about the nature of our universe. Designed and intended for nonscience majors, this course also serves as a useful survey of the field for those intending to begin formal study in the future.

Conditions of enrollment: This course is open only to students who have taken a college math course. It is *not* open to students who have credit for Physics 121 or 131 and it is *not appropriate* for Liberal Studies students in the pre-credential options who should take Science 210/210L.

Text: *Conceptual Physics*, 8th Ed., Volume 2, by Paul Hewitt

How to get help: My office hours are Mondays 2-4 PM and Wednesdays 2-4 PM. In addition, I will be in the Physics Tutoring Center (3-213) on Fridays from 1-2 PM. The Tutoring Center will also be open (and “equipped” with other faculty members) in Room 3-210 on Wednesdays 10-12, in Room 3-209 on Thursdays 10:45-12, and in Room 213 on Fridays from 10-11 and 2-3. Finally, if you can’t come during any of these hours, I will make an appointment with you for another time. For me, one of *the* most enjoyable aspects of teaching is working with students one-on-one and clearing up specific problems. *Please* come see me often.

Class Attendance and Participation Class meetings are MW 4:00–5:40 PM The class will consist of a mixture of group work, class discussion, and “minilectures” and your attendance and good faith participation in group work will determine a portion of your grade. I have included a schedule of topics with this syllabus.

Homework: I will make daily assignments to be completed before each class meeting. Putting in a good faith effort on these exercises is *essential* as they will form the basis for much of what happens each day in class. They will also be your best indication of what I consider to be important and, therefore, what is likely to appear on exams.

Each day’s homework should be 1) written on a *separate* sheet (or sheets) of paper, 2) *dated* at the top of the first page, and 3) kept—organized *by date*—in a *marked section* of a loose-leaf notebook that you bring to class with you every day.

You will go over your homework during the next class with other group members. A significant portion of your grade will be determined by the conscientiousness you display in completing these assignments. (See *Group Work and Daily Group Evaluations* below.) We will clear up any remaining difficulties during the subsequent class discussion. You should leave class either with fully completed homework or with notes that will allow you to complete it later the *same* day. No formal “solutions” will be published. Finally, it should go without saying that if you miss class, you are still responsible for the missed material.

Group Work and Daily Group Evaluations: A significant amount of class time will be spent working in assigned groups with three or four other students on homework-type exercises. Immediately at the start of class each day you will move your chairs into your group configuration and go over your homework with other group members. Each day, on a rotating basis, one group member will act as the group’s evaluator. At the end of each class, the evaluator will turn in a standardized form (that I will supply) indicating who was present and evaluating each group member both on the level of completion of that day’s homework assignment and on the quality of participation in the group work for that day. The evaluator may or may not choose to solicit help from the group in performing the evaluation. After the evaluation forms are submitted, they will be held in confidence.

I will combine the reporting categories on each daily evaluation to reach a single score from 0 to 4. I will throw out the lowest three evaluations to allow for absences and/or “bad days” for *any* reason including illness. Perhaps *most* importantly, I will make whatever adjustments I deem necessary to ensure fairness and consistency *within* and *between* groups based on my own evaluations of your work in groups and on my examinations of your notebooks. You are always welcome to review your scores in my gradebook at any time.

Notebook Evaluations: At the beginning of each exam you will turn in your notebook with your homework *organized* by date. During the exam I will look over your work, make some notes, and assign a score from 0 to 4 with “4” indicating very consistent and often exceptional work, a “3” indicating generally consistent and conscientious work, “2” indicating inconsistent or lower quality work, and a “1” indicating only occasional or generally incomplete, low quality work.

Subjective Bonus: A small portion of your grade is also determined by my own overall subjective evaluation of your work in the class. Although it is subjective, my policy is that it will *not* be less than the average of your quiz and notebook evaluation scores. It allows me *only* to *reward* students who make contributions to the class that may not be fully recognized, who make particularly effective use of office hours, or who, in any other way, seem to deserve a bit of additional credit.

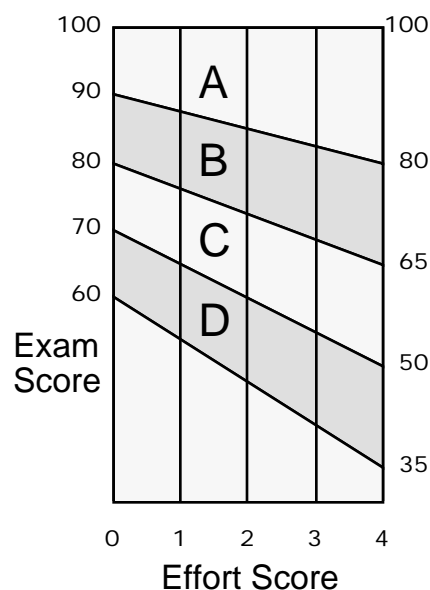
Examinations: There will be one midterm exam and a final exam. Your overall “Exam Score” will be given by

$$\text{Exam Score} = \begin{cases} 100\% \text{ Final,} & \text{if Final} \geq \text{Midterm} \\ 60\% \text{ Midterm} + 40\% \text{ Final,} & \text{if Final} < \text{Midterm} \end{cases}$$

This policy is intended to allow for 1) a “bad day” on either the final or the midterm or 2) entirely missing the midterm. (Note however that *taking* the midterm should definitely *not* be considered “optional”; it is both good practice for the final *and* insurance against a disappointing performance on the final.)

Grading: I *do not* grade on the curve, so there is a tremendous advantage to be gained from working productively with your classmates. I will combine your Daily Group Evaluations, Notebook Evaluation, and Subjective Bonus scores with relative weights of 2, 2, and 1 respectively into a single “Effort Score” on the same 4 point scale

My philosophy on grades is as follows: I want to insure that solid, good faith *effort* in the course is rewarded with a passing grade while reserving A’s for demonstrated achievement on exams. Accordingly, your grade will be based on your exam scores with an increasingly liberal correction for solid effort at the lower grade levels as indicated in the graph above right. This graph represents *guaranteed minimum grades*; I reserve the right to alter the breakpoints downward (i.e., in your favor) should that seem appropriate.



Email list: I have set up an email list called “phy102” (Note: no space between the “phy” and the “102”) to support this class. Anyone who subscribes to the list will receive all email sent to the list. I intend to use it to distribute important messages that shouldn’t wait until the next class meeting. You can just “lurk” on the list (meaning that you simply receive messages) or you can also use it to initiate discussions on class material—including homework—with other students in the course.

To subscribe to the list, send a message to “listproc@listproc.csupomona.edu” with no “subject” and a single line that reads

subscribe phy102 name [with your first and last name substituted for “name”]

Save the message that listproc sends back to you because it contains important information.

Academic Integrity: Please be aware of the statement on academic integrity in the University catalog. My strongest desire is to act as facilitator for your studies in physics. Accordingly, I operate on the assumption that all of our interactions are based on honesty and good faith. I have no desire to act as policeman, just as *you* should not have to be concerned about being treated fairly and with respect. Because our trust in each other is crucial to the effectiveness of our relationship, I take an uncompromising stance on the necessity for sanctions when it is violated.

Tentative Course Schedule:

<i>Date</i>	<i>Read Before Class</i>	<i>Topics/Events/Notes</i>
3/26		Introduction, Distribution of Class materials
3/28	Ch. 1, Ch. 2 (p. 25)	About science Motion in one dimension—speed and velocity
4/2	Ch. 2 (the rest) Ch. 3	Acceleration and free fall Motion in two or more dimensions—projectiles, satellites, circular motion
4/4	Ch. 4	Newton’s laws of motion
4/9	Ch. 5	Momentum—a “conserved” quantity
4/11	Ch. 6	Energy—another “conserved” quantity!
4/16	Ch. 7	Rotational motion, angular momentum—yet <i>another</i> “conserved” quantity!!
4/18	Ch. 8	Gravity
4/23	Ch. 8-9	Planetary and satellite motion
4/25	pp. 206-210	“Scaling laws”, Review for midterm
4/30		Midterm Exam
5/2	Ch. 18	Vibrations and waves
5/7	Ch. 19-20	Sound
5/9	Ch. 21	Electric forces
5/14	Ch. 22	Electric circuits
5/16	Ch. 28	Light is a wave—diffraction, interference, and polarization
5/21	Ch. 30	Light is a particle—photoelectric effects, the wave particle duality
5/23	Ch. 34 (p. 645)	Special relativity, the relativity of time
5/28		(Holiday)
5/30	Ch. 34 (the rest)	The relativity of space, momentum and energy
6/4		Final Exam (Monday, 3:50 - 5:50)