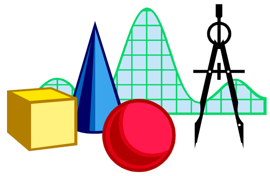

PHYS 101 "Concepts of Physics I"
Fall 2006 University of Virginia
Meets Tuesdays and Thursdays, 12:40 – 1:45 pm in physics room 203.

This semester we will cover several topics, including the solar system, sound, light, science in science fiction films, electricity, and Einstein's theory of Relativity. See the calendar, which is a separate handout.

This class is designed for non-science majors, but science majors should find it interesting as well. We will cover a variety of topics, which I believe will keep the class interesting. The downside is that sometimes the class may seem disjointed, but I will do my best to connect topics.

We will use math, but if you remember arithmetic and some algebra, you should be fine.

Instructor: Robert Watkins
Office Telephone: (434) 924-4173
email: rbw2b@virginia.edu

Office: Physics Room 312 D (new this year)
FAX: (434) 924-4576

Office hours: Wednesday s 3:30 – 4:00 pm or by appointment

Please begin your email subject with "PHYS 101" so that I don't accidentally delete it.

Teaching Assistant: Russell Bloomer
email: rdb2k@virginia.edu

Required book: <u>*Physics: Concepts and Connections,*</u> 4th edition, by Art Hobson
Required accessory: Hammond Swivel and Tilt Mini-Globe, Dark Blue Ocean (ISBN: 0-8437-1551-0)

Web page: http://galileo.phys.virginia.edu/classes/101.rbw2b.fall06/

The web page will primarily contain solutions to the homework and sample exams.

Class attendance is important. Some test questions will refer to demonstrations and other activities in class. Homework is also very important. I encourage you to work together on the homework, but you must write it up <u>separately</u>, and <u>in your own words</u>. See the calendar for due dates. Readings from the text will be assigned in class, and will be discussed during subsequent lectures.

Homework is due *no later than* the beginning of class on the stated due date. If you submit it after that, it will probably be counted late and severely penalized. If you will be out of town on the due date (for a sports event, job interview, etc.), submit your homework early, before you leave.

How your grade is determined:

3 homework sets, 30% of grade (10% of grade each)
Midterm exam, 30% of grade
Final exam, 40% of grade

Welcome to the class.

How to do well on the homework assignments

Physics majors or graduate students will be grading your homework assignments. To receive a good score, you should try to impress them with both your knowledge of the course material and your organizational skills. Here are some tips:

- Always explain your answers, even if the assignment does not specifically say "explain."
- Sketches or drawings are often very helpful.
- Many questions are somewhat open-ended, so try to answer thoroughly, yet succinctly. Notice that the "excellent" answer in the example below is only a few sentences long, but includes a lot of important information. It's better to be succinct and precise than long-winded and vague.
- Put your problems in order. Don't force the grader to search for your answers. Leave room for sketches and calculations with your responses--don't put them in an "appendix."
- Don't attach "scratch" paper. Completed calculations should be written up neatly and included within the appropriate problem—not as an appendix!
- You must mostly type your work. It's fine to write out calculations and drawings by hand, but please be neat.
- Don't attach a copy of the assignment to the front. The graders have a copy of the assignment.
- Staple your pages together. (Staplers will be available in the classroom when you submit your assignment.)

Sample Homework Answers

Question:

You drop a coin to the ground starting from rest, and time its descent with a stopwatch. You do this only once, and observe the time to be 0.6 seconds. Calculate the height through which the coin fell, and comment on the accuracy of your result.

Fair answer:

Use $H = 1/2\ g\ t^2$, with g = 9.8 and t = 0.6. So H = 1.76 meters. I think this is pretty accurate.

Good answer:

Use $H = 1/2\ g\ t^2$, with $g = 9.8\ m/s^2$, and t = 0.6 s. This gives H = 1.76 meters. Air resistance is low, so the accuracy primarily depends on the time. If I'm off by a tenth of a second either way, I would get 1.23 or 2.40 meters. So H is only reliable to within a half meter or so.

Excellent answer:

If g is constant (and it is--it only varies appreciably if you go far from the surface of the Earth), and air resistance can be ignored (probably true for a coin), then we can use $H = 1/2\ g\ t^2$, with $g = 9.8\ m/s^2$, and t = 0.6 s. This gives H = 1.76 meters. If I'm off by a tenth of a second either way, I would get 1.23 or 2.40 meters. So H is only reliable to within a half meter or so. A better method would be to repeat a few times and average the results.