

**Phys 2011**

**General Physics I**

**Fall 2009**

M,W,T,F at 2:00pm  
MWAH 195

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<http://www.d.umn.edu/~skatsev/Phys2011.htm>

**Prerequisites:** Math 1290 or Math 1296 or Math 1596

**Texts:** *Fundamentals of Physics* by D. Halliday, R. Resnick, and J. Walker;

**Course content:** We will undertake a systematic study of classical physics topics: Mechanics, Fluid dynamics, Heat, and Thermodynamics. The emphasis will be on developing the skills to understand, analyze, and solve physical problems. Mathematical descriptions will rely on calculus.

**Grading:** Course grades (adjusted to a Gaussian curve) will be based on these contributions and associated weights.

- Homework - 20%
- Lab – 15%
- Mini-quizzes - 10%
- Tests (two) - 30%
- Final exam 25%

The expected grading scale is:

>85% A-,A; >70% B-,B,B+; >55% C-,C,C+; >45% D,D+; <45% F

Missed tests and homework will count as zero.

### **Extra credit**

*Physics in the news:* A total of 10% extra credit will be granted for submitting a summary of three physical discoveries reported in national or international news. Your 1-page essays should be written in your own words and should elaborate on the topic of the discovery, explaining why it is important and the essence of the discovery. The essay must be accompanied by a copy of the *original* technical article published in a [peer-reviewed](#) journal (such as *Science*, *Nature*, *Physical Review Letters*, etc.), as well as the referring news article. The UMD library has electronic access to a number of leading technical journals: <http://duluth.liblink.umn.edu/duluth/az>. The topic can be anything related to physics, including astronomy and physics-based technology. The essays can be submitted any time before the final exam. Grade points will be assigned on a pass/fail basis with no partial credit.

**Clickers:** Purchase of clickers is strongly recommended. You will need them throughout the course; so don't forget to bring them to class.

**Class participation:** There is no grade bonus for class participation, nor there is penalty for missed classes. However, active thinking in class and good note taking will make your life much easier. Lecture notes are there to help you. Thinking while you take them will cut your homework time by half.

**Labs:** The labs are administered separately from the lecture. Labs do not meet the first week of the semester.

**Lab Manual:** General Physics I-II. Please also purchase an 8"x10" quadrille-ruled lab notebook.

**Homework:** Reading and problems will be assigned regularly. The goal of these assignments is to give you both practice and an opportunity to receive feedback. Only selected problems will be graded but you are encouraged to discuss all of them and seek explanations for any of the difficulties. Homework solutions should demonstrate the knowledge of both physical concepts and the associated mathematical aspects. Most problems will involve the old-fashioned, hand-crafted mathematics. Use of computer packages, such as Mathematica or MatLab, is not acceptable as a substitute, unless this is explicitly specified. Mathematical calculations should be accompanied by brief English explanations of your reasoning. The explanations should be as simple as possible, but not simpler.

Please be nice to the TAs and make sure that your homework is legible. Neatness counts.

Please submit your homework at the beginning of the class on the day that it is due, by placing it on the desk at the front of the classroom. Please include your student ID on all submissions! Due to the size of the class, late assignments will not be accepted. To minimize the effect of life's unexpected events on your grade, your worst homework will be dropped from the final tally.

Discussion of homework problems with classmates is permitted and encouraged. Use of solution manuals or comparable resources is not permitted. All work turned in must be your own, i.e. you should be able to present your solution and explain it.

### **Homework Requirements**

Homework solutions should show the logic and the individual steps of the solution. Scratch and preliminary calculations should not be included. Here are a few suggestions for doing homework problems:

- Make the question part of your answer. Your solution should make clear what the problem asks. You don't need to copy the full statement of the problem from the textbook but you do need to specify what is given and what is being asked.

- Include diagrams. Visualizing the problem whenever possible is a useful habit. Make your drawings large and clear. Use the diagrams to define quantities and symbols used in the mathematics.
- Start by understanding the physical principles involved. Basic formulas are easy to remember, and more complicated ones are often easy to derive if you understand how they came about. The question “*Which formula do I use?*” is a bad one to ask! When you understand the underlying physical processes, the answer is almost always obvious.
- Use standard and correct notation for physical variables.
- Work problems symbolically as far as possible. Plugging in numbers should be done after all the algebraic manipulations.
- Show units for all numerical values, including those in the intermediate calculations. Dimensionality analysis is very useful and helps avoid trivial mistakes.

*Individuals who have any disability, either permanent or temporary, which might affect their ability to perform in this class, are encouraged to inform the instructor at the start of the semester. Adaptation of methods, materials, or testing may be made to provide for equitable participation.*