

Phys 2011

General Physics I

Fall 2011

M,W,T,F at 2:00-2:50 pm
MWAH 195

<i>Instructor:</i>	Sergei Katsev	<i>Phone:</i>	726-6057
<i>Office:</i>	356 MWAH	<i>E-mail:</i>	skatsev@d.umn.edu
<i>Office hours:</i>	MWF 3:00-4:00 pm	<i>Course web page:</i>	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, and Heat. The emphasis will be on developing the skills to understand, analyze, and solve physical problems. Mathematical descriptions will rely on calculus.

Grading: Course grades will be based on these contributions and associated weights.

- Homework - 20%
- Lab – 5%
- Mini-quizzes - 10%
- Tests (two) - 40%
- 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. There will be no curve.

Final exam: see schedule on UMD website.

Extra credit

Physics in the news: A total of 5% extra credit will be granted for describing three physical discoveries reported in national or international news. Your three 1-page essays should be accompanied by the *original* technical [peer-reviewed](#) papers (such as in journals *Science*, *Nature*, *Physical Review Letters*, etc.) and the referring news articles. The essays can be submitted any time before December 10. Grade points will be assigned on a pass/fail basis with no partial credit. Instructions for preparing and submitting your assignment are at <http://www.d.umn.edu/%7Eskatsev/Phys2011/ExtraCredit.html>.

Attendance and participation: There is no penalty for missed lectures and attendance is not enforced. Missing homework and tests, however, will result in zero scores. In some exceptional circumstances, make-up quizzes can be arranged but these are not

guaranteed. You are encouraged to actively participate in class. Given the large class size, this is not always possible, but don't be shy asking questions. Physics is ruthlessly cumulative, so it is better to correct misunderstandings at an earlier stage. Active thinking in class and good note taking will make your life much easier. Thinking while taking your notes will cut your homework time by half.

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

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.

Contacting your instructor: Questions about the lecture course can be addressed to your instructor either in person or by email. Please understand that email requests may not be answered right away and may require a day or two. For questions regarding labs, please contact your lab TA.

What can you expect

- Lectures will focus on explaining the physical phenomena and their mathematical descriptions. You will also see a number of in-class demonstrations that illustrate what we talk about.
- Lecture notes that you will see on the screen will be later posted on the course web site.
- Your questions and concerns will be answered in an open and professional manner during either lectures or office hours.
- We will go through a number of example problems in class, as well as some of the quiz and homework problems. It may not be possible, however, to do them all, or enough, and you may feel the need for more practice in problem solving. You are strongly encouraged to come and discuss your difficulties during office hours. The Physics Department also offers a separate problem-solving class for which you can sign up.
- Because of the large class size, several TAs will be grading your homework. To ensure fairness, the same TA will grade the same problem across the entire class. Your homework will be returned to you within one week or less.

What will be expected from you

- You will be expected to do your weekly reading. Lecture notes are important and useful but they cannot replace your own reading.
- You are expected to invest your time. Depending on your background and previous experiences with physics and mathematics, you may expect to invest between 4 and 12 hours a week in this course.
- You are expected to seek explanations and help if you are having difficulties.

- Honesty and academic integrity. It is expected that the work you submit is your own and you can argue it and explain it if needed.
- It is assumed that you have completed the course prerequisite and are sufficiently comfortable with math to follow the simple derivations in this course.

Homework: Reading and problems will be assigned regularly. The goal of these assignments is to give you both practice and 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. The TAs cannot give you credit if they can't understand what you have written or meant.

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. *Your solution should be legible and easily understood by another person.*

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.
- Make large and clear diagrams. Visualizing the problem whenever possible is a useful habit. Make your drawings large and clear. Use the diagrams to define the quantities and symbols that you use. Make sure that you label your axes and include the appropriate units.

- 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.
- Work problems symbolically as far as possible. Plugging in numbers should be done only after all the algebraic manipulations. A correct symbolic answer will be given almost full credit (e.g., 4 out of 5), whereas a jumble of numbers can rarely be followed and partial credit may be impossible to give.
- 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.