

Physics 61: Introductory Mechanics 1

Syllabus Spring 2007

Instructors and Contact Info

Instructor	Recitation Sections	Email
Dr. Howell	05	howell@tunl.duke.edu
Dr. Illing	07, 10	illing@phy.duke.edu
Dr. Socolar	06	socolar@phy.duke.edu
Dr. Tornow	01, 08	tornow@tunl.duke.edu
Dr. Wu	03, 09	wu@fel.duke.edu

Note Well: The instructor for your *Recitation* section is the person you should think of as “your professor” for this course. He will be the person in the best position to work with you when conceptual or procedural issues come up. He will also be the one who assigns your grades (though all instructors will confer regularly to ensure fairness across sections).

If issues arise that you do not think can be resolved by talking to your recitation instructor, you may contact either of the following people:

Course Coordinator:

Dr. Joshua Socolar
socolar@phy.duke.edu
660-2557
Room 096, Physics

Lab Coordinator:

Dr. Mary Creason
mary@phy.duke.edu
668-2659
Room 148, Physics

Duke Community Standard

In all aspects of this course, students are expected to live up to the Duke Community Standard (the Honor Code). This implies that you will not submit work that is not your own and that you will not provide information about quizzes or exams to students who have not yet taken them.

Textbook: *Understanding Physics*, Parts 1 and 2
Cummings, Laws, Redish, and Cooney (Wiley, 2004)

This book is available in several flavors. One is the full edition (Parts 1-4): ISBN: 0471370991.

You can also get the parts separately: Part 1 ISBN: 047146435X
Part 2 ISBN: 0471464368

The book is readily available through online booksellers in addition to the campus bookstore.

In addition to the topics covered in this textbook, we will use a handout written by Dr. Socolar on static systems. It is available in the Documents area of the Blackboard site.

Many useful documents will be regularly posted on the Blackboard site, including weekly homework assignments, lab instructions, pre-lecture notes, your quiz and exam scores (cumulative) and more. You should check the site at least once or twice a week.

General Order of Presentation

This semester we will cover the following general topics:

- Statics 1 – Force balance: physical sources of force; forces as vectors; Newton’s 3rd law; static equilibrium; fluids (static pressure, Pascal’s principle and Archimedes’ principle).
- Kinematics: motion in 1D and 3D, including circular motion.
- Dynamics of particles: Newton’s Laws; momentum; kinetic energy; work; potential energy.
- Statics 2 – Torque balance: static equilibrium of rigid bodies; static friction; torque due to distributed forces (e.g. gravity).
- Dynamics of rigid bodies: rotational energy; angular momentum.
- Special topics: universal gravitation; simple harmonic oscillations and resonance; non-linear oscillations and chaos; complex oscillations.

A more detailed, week-by-week schedule for the course is available on the Blackboard site. The detailed schedule is subject to midcourse revision if required in the natural course of things, but the dates and times for the major exams on this schedule should be accurate.

Homework will be assigned each Monday. *You should prepare solutions to the homework before you arrive at your recitation on the following week.* During that recitation you will have some time to work in groups or with your instructor to deal with problems you did not understand. There will then be a quiz that is closely related to one or two of the problems.

After recitation, you must write up solutions to all of the problems and turn them in by 3:30 PM on Thursday (ten days after they were assigned). One of the problems will be selected at random for grading.

You are expected to spend three to six focused hours per week on homework. You are strongly encouraged to spend some of this time discussing the homework with peers. You may also make use of the Physics Help Room, where a TA will be available to answer questions. (Help Room hours will be announced.) Experience suggests that students do better if they make several passes at the homework problems, seriously attempting each one early in the week and then coming back to them later, which often allows new ideas to come forward. Every problem should be attempted or reviewed several times – at least twice before recitation, once in recitation, and once as you are preparing written solutions to be turned in. A detailed strategy for success on the homework, and consequently in the course as a whole, is described in “Dr. Brown’s Homework Guidelines,” available on the course Blackboard site.

Written solutions to homework problems should contain the following two elements in addition to clearly displayed equations and algebraic steps required to obtain the answer:

- a schematic diagram showing the relevant physical objects and quantities;
- at least a few English words (as opposed to symbols alone) stating the physical principles expressed in any equations that do not follow from purely algebraic manipulation of equations above them.

There is no uniformly applicable rule for determining what to write out. An explanation, explicit guidelines, and many examples will be provided in class.

Quizzes: Each recitation will include a 20-30 minute quiz based closely on the homework being discussed that day. Note that this is *before* the written solutions are due. The idea is for you to do as much of the homework as you can before recitation so that you know what questions you need to ask and have time to discuss them before the quiz. After taking a quiz, you may not discuss it with anyone outside your recitation section until all recitation sections have met for the week (Tuesday at 5:30pm.)

Laboratory exercises are designed such that they can be completed and turned in before you leave the lab *if you prepare before lab by reading the relevant lab manual and identifying questions you need to ask*. You will work in groups of 2, 3, or 4 on lab activities and you are expected to participate in a cooperative and supportive manner.

Exams

There will be **two mid-term exams**, administered on Friday morning during the lecture period. Each exam will be offered a second time, on Wednesday morning of the following week. *You must take the exam the first time it is offered* unless you have cleared your absence ahead of time with your Recitation Instructor or the Course Coordinator. You may then take the makeup exam in order to improve your score. Your grade for the exam will be the *average* of your two scores.

The **Final Exam** will be cumulative, but will emphasize topics that are studied after the second mid-term exam. There will be no makeup exam for the Final.

Course Grade

The following is the grading scheme that will be used in the course. The instructors reserve the right to make revisions to use their personal judgement in individual cases when assigning final grades.

Weekly homework	15%
Weekly quizzes	15%
Labs	15%
Exam 1	15%
Exam 2	15%
Final exam	25%

Note Well: Homework, labs, and quizzes are work nearly *half your grade* all by themselves. Students who work diligently on their homework and labs almost never have serious difficulty with the course.

Regrade requests

The person responsible for determining your grade in the course is your **Recitation Instructor**. All questions about grading should be addressed to your instructor, who will then contact the appropriate TA or consult with other instructors if necessary. The instructors also consult regularly with each other to ensure that grading standards are similar in all sections. If any circumstances arise in which you do not feel comfortable discussing an issue with your instructor, you may contact either Dr. Socolar or Dr. Creason.

For further information on all questions regarding required work and grading, see the “Grading Policies” document. The policies detailed there apply uniformly to all sections.