

# PHYS 1211: Introductory Physics for Science & Engineering I

## Syllabus

University of Georgia, Spring 2011

Welcome to Physics 1211, the first half of a two-semester introductory physics sequence. This semester we'll focus on Mechanics, the study of motion. Understanding the motions of objects and their interactions is one of the principal goals of physics. The fundamental laws of mechanics, first enumerated by Isaac Newton in the 17<sup>th</sup> century, can be applied to an enormous range of phenomena on scales as diverse as dust grains and galaxies, and from the esoteric to the everyday.

In this semester you'll learn about the concepts associated with the study of motion, including velocity, acceleration, inertia, force, work, energy, and momentum. You will see how these concepts are related to each other through the laws of Mechanics—Newton's Laws of Motion and their corollaries, the conservation laws of energy, linear momentum, and angular momentum. Along the way we will apply these basic laws and concepts to different kinds of motion: constant-acceleration motion, uniform circular motion, statics (lack of motion), collisions, rotations, and oscillations.

Physics is a quantitative science. While we won't neglect the qualitative and conceptual aspects of Mechanics, much of the work in this course involves setting up and solving math problems. You will need to communicate your results in a variety of ways—mathematical and numerical expressions, graphs, diagrams, even “plain English.” You are expected to have a working knowledge of college algebra, trigonometry, basic geometry, and differential calculus (a co-requisite to this course), as well as an understanding of elementary science concepts (e.g., scientific notation, significant figures, units and dimensions, graphing). We will not be reviewing this material in class. Please come see me if you are concerned about your preparation for this course.

If you are a prospective physics or astronomy major, you probably should take PHYS 1311 instead of this course. Please contact the instructor for that course, Dr. Craig Wiegert, as soon as possible.

### Basic Information

<b>Instructor:</b>	Dr. Steven P. Lewis	<b>Email:</b> lewis@physast.uga.edu
<b>Office:</b>	307A Physics Building	<b>Phone:</b> 706-542-0158

**Class:** Tuesday/Thursday Period 4 (12:30-1:45 PM), 202 Physics Building.

**Lab:** Various times, 314 Physics Building.

**Final Exam:** Tuesday, May 10, at 12:00-3:00 PM, 202 Physics Building.

**Homework:** Due every Tuesday evening, unless otherwise announced.

**HW Clinic:** Mondays at 5:00-6:00 PM in 221 Physics Building (optional)

**Office hours:** To be determined.

**Website:** <http://www.physast.uga.edu/classes/phys1211/lewis/>

## Required Course Materials

- *Physics for Scientists and Engineers: A Strategic Approach, Volume 1, 2<sup>nd</sup> Edition*, by Randall D. Knight (Pearson Addison-Wesley, 2008).
- Student access code for *MasteringPhysics* online homework system. An access code comes packaged with new textbooks. If you have a used textbook, you will need to purchase access to *MasteringPhysics* at <http://www.masteringphysics.com>.
- *Experiments for an Introductory Physics Course* (Hayden-McNeil, 2010).
- An Interwrite PRS RF response pad (“clicker”). Bring it to every class; we will be using clickers throughout the semester for participatory activities.
- A simple scientific calculator for exams, which must be *non-programmable, non-graphing, and non-symbolic*. Examples of acceptable calculators include the TI-30X series or the Sharp EL-531. Use of calculator graphing, algebra-solving, or programming functions will not be permitted for any exam, nor will PDAs, cell phones, etc.

## Online Course Materials

- Weekly homework assignments will be carried out online using the *MasteringPhysics* system, which is accessible at <http://www.masteringphysics.com>. This is a well designed, easy-to-use system that gives you immediate feedback and useful hints. It also has numerous other (non-assigned) resources for extra learning experiences.
- You will be subscribed to a low-volume email announcement list. It is essential that you check your email regularly (at least daily), or else you may miss important class announcements. Missing an announcement because you failed to read your email is not considered an acceptable excuse for not knowing the content of the announcement.
- The course website will serve as a repository for additional course content and information (e.g., homework and exam solutions, exam statistics, grades, etc.). Its URL is <http://www.physast.uga.edu/classes/phys1211/lewis/>.

## Other Student Resources

- Optional weekly homework clinics and office hours will give you and your classmates an opportunity to work on problems in small groups. I will be on hand to answer any questions and give guidance, but this is really designed for you to work together, not to watch someone else work problems.
- If you cannot come to my regular office hours, or need additional help, please set up an appointment (by email, by phone, or in person) to see me outside of class.
- There is a *Student Workbook* associated with the course textbook, which you may find useful in bridging the gap between textbook/lecture examples and homework problems. Information on this and other resources is provided in your textbook.
- If you need to improve your math preparation, I recommend *Mathematics for Physics with Calculus* by Biman Das (Pearson Addison-Wesley, 2005).
- Free tutoring is available through the UGA Tutoring Program at Milledge Hall. In addition, the Department of Physics & Astronomy maintains a list of graduate students and majors who are available as tutors for hire (see <http://www.physast.uga.edu/tutors>).

## Grading Policy

**Grade components:** Your overall grade will be determined from your course performance, as measured by your semester average, which will be computed as follows:

25%	Cumulative final exam
45%	Three in-class exams (20% for highest, 15% for middle, 10% for lowest)
15%	Laboratory grade
12%	Homework average
3%	Participation (in-class activities, reading quizzes, etc.)

**Letter grades:** Ranges for letter grades will be *no worse for you* than the following:

A	= [87-100]	B+	= [83-85)	C+	= [73-75)	D	= [50-65)
A-	= [85-87)	B	= [77-83)	C	= [67-73)	F	= [0-50)
B-	= [75-77)	C-	= [65-67)				

Here a square bracket means that the end point is included in the range, and a round bracket (parenthesis) means the end point is not included in the range. Actual grade ranges *may* end up having lower cutoffs, depending on the overall level of performance.

**Regrade requests:** Any requests for a regrade of an assignment or an exam must be made no later than one week after the item is returned. Keep in mind that for a regrade I will look at the entire assignment/exam, not just one problem, and may raise *or* lower your score. Arithmetic errors in adding up points will be handled separately. Regrade requests (including those for online homework) should be accompanied by all your work.

**‘Incomplete’ grades:** According to UGA policy, a grade of Incomplete “indicates that a student was doing satisfactory work but, for *non-academic* reasons beyond his/her control, was unable to meet the full requirements of the course ... The instructor of the course should indicate to the student the deadline for completing the work in the course. No more than three semesters (counting summer school as one semester) may be allowed to complete the work in the course, but the instructor may specify an earlier deadline. If an I is not satisfactorily removed after three semesters (counting summer school as one semester), the symbol I will be changed to the grade F (or U for a course graded S/U) by the Registrar.” I will adhere to this policy for this course.

**Course withdrawal:** Make sure you are familiar with the UGA policy on withdrawal from courses (see [http://bulletin.uga.edu/Bulletin\\_Files/acad/Courses.html](http://bulletin.uga.edu/Bulletin_Files/acad/Courses.html)). The withdrawal deadline for this semester is March 24. For withdrawals before the deadline, I will generally enter a grade of WP even for technically failing grades, *if* I judge that you have made a sincere effort in the class. It is possible to earn a grade of WF before the deadline; don’t assume otherwise. Withdrawals after the deadline must be WF, unless the Office of the Vice President for Student Affairs permits a hardship withdrawal from all courses. See the above web page for further details.

If you don’t complete the initial required administrative tasks of the course (*e.g.*, the questionnaire, the agreements sheet), or are demonstrably not attending class and completing work, you may be withdrawn from the class for “excessive absence”—possibly with a WF.

## Exams

**Number and rules:** There will be three in-class midterm exams and a *cumulative* final exam. They will all be closed-book and closed-notes. You may use a simple scientific calculator that is *non-programmable, non-graphing, and non-symbolic*. (Calculators such as the TI-83 or TI-84 are *not allowed*.)

**Formula sheets:** I will provide you with a formula sheet on each exam, and will post a copy to the course website before the exam. Its purpose is to focus your studying on understanding rather than memorization. If you need an equation that's not on the sheet, don't memorize it; learn how to derive it from the equations that *are* given.

**Work:** Exams will comprise both conceptual and problem-solving questions, very similar to homework, practice problems, and in-class examples. Unless told otherwise, you must show your work on each problem in order to receive full credit. Partial credit is awarded (based on your work) for incomplete or incorrect answers, so it is usually in your best interest to attempt every problem.

**Solutions:** Detailed solutions will be posted to the course website after each midterm.

**Missed exams:** *There will be no make-up midterm exams.* If you need to miss a midterm exam for a *serious, documentable* reason, your final exam grade will be substituted for one of your midterms, making your final exam worth 35-45% of your overall grade (depending on how this grade compares to your other midterm exam grades). This policy is designed to handle unavoidable situations like medical or family emergencies, or previously scheduled academic or athletic events. You *must* contact me as soon as you know of the conflict (before the exam if at all possible), and you must provide sufficient documentation in a timely fashion. (An example of *unacceptable* documentation is a note stating only that you visited the health center, with no indication of the severity of your illness.) Do not presume that your situation or documentation merits an excused absence; that determination is not your prerogative. *Unexcused exam absences will result in an exam grade of zero.*

A make-up final exam will be given only for students with legitimate, documentable reasons as explained above.

**Final exam schedule:** Tuesday, May 10, at 12:00-3:00 PM in 202 Physics Building.

## Homework

### Reading Assignments:

- **Rationale:** The course textbook is well written and easy to read. Your time spent in class will be much more meaningful and beneficial if you read the textbook *in advance*.
- **Assignment:** For classes in which we will be starting on a new chapter, you are expected to come class having read the *entire chapter*.
- **Quizzes:** Short multiple-choice quizzes based on the reading material may be given at the start of class, using the Interwrite PRS RF response pads ("clickers").

## Problem Sets:

- **Rationale:** Imagine trying to learn to play basketball just by reading books about it and watching other people play. You won't get very good at it that way. You need to get out on the court to practice skills and play some games. So too with physics. The single most important thing you can do to learn and become proficient at physics is to get regular, personal practice doing physics problems.
- **Logistics:** Weekly problem sets will generally be due every Tuesday evening at 11:59, unless otherwise stated. Problem sets will be carried out using the *MasteringPhysics* online homework system. Access codes for this system come packaged with new textbooks as part of the cost. Students with used textbooks will need to purchase access at <http://www.masteringphysics.com>. The first time you login, you will be prompted for a course title. For this course, use PHYS1211Lewis. Detailed solutions to each problem set will be posted on the course website sometime after the due date.
- **Grading:** Responses will be graded for correctness, although for some problems incorrect responses may earn partial credit. Each problem set will be equally weighted in your homework average, unless otherwise specified. Within a given problem set, the point value for each problem will be indicated. If you've read this far, write "Sneaky" on the upper left corner of your Agreements sheet before handing it in. Read on.
- **Dropping lowest three:** If you complete the online student evaluation for this course during the official period at the end of the semester when the evaluations website is up, then I will drop your lowest three homework scores when calculating your homework average for semester grades. If you do not complete the evaluation, then all homework scores will be included in your average. This policy serves two functions: (a) it gives you an incentive to submit a course evaluation, and (b) it compensates for unavoidable circumstances that may prevent you from submitting homework on time (*e.g.*, illness, scheduled event, emergency, etc.). *Late problem sets will not be accepted or excused.*
- **Teamwork vs. plagiarism:** Teamwork can be a very good way of learning, so I encourage you to interact with your classmates on homework. That is in fact one of the purposes of the optional weekly clinics. However, do not mistake teamwork for plagiarism; it is unacceptable, for example, to divvy up the problems and then swap solutions. The work you submit *must be your own!* Copying from someone else's work, or from any other source of homework solutions, is a form of plagiarism and a violation of academic honesty policies. Remember, the only way you'll learn the subject is by sweating through problems on your own and/or with your study team.
- **Final comment:** Working physics problems is *by far* the best way to learn physics, so it is important that you make every effort to do an honest, thorough, and timely job.

## **Class Activities/Participation**

You will often be asked in class to answer conceptual and quantitative questions, both individually and in small groups, using the Interwrite PRS RF response pads (“clickers”). Your responses will be graded primarily on participation. These activities allow you to demonstrate your sincere effort and active class engagement. Extensive research in the area of science education shows that these kinds of in-class activities substantially enhance the learning environment.

At the end of the semester, the results of these exercises will be combined with any reading quiz scores as a component of your semester average (“Participation”). In order to compensate for occasional absences, problems with your clicker, or random errors (your fault or not), I will drop 20% of the items that enter into the participation portion of your grade. I will not accept a written record of your responses as a clicker substitute. Furthermore, given the low weight of each item on your overall grade and the fact that I drop many of them, I will not be receptive to requests to adjust the record on these participation-related activities for minor, one-off problems.

## **Extra Credit**

There is no extra credit in this class. Requests for extra credit assignments or activities will be ignored. Repeated requests will be met with a vexed look and a cross word.

## **Student Responsibilities**

- Above all, you have the right to expect courtesy from your fellow students, and the same will be asked of you. Courtesy includes the expectation that everyone will come to class ready and willing to learn and to interact, and able to ask or answer questions freely. Courtesy also implies that you arrive on time and stay until the end of class.
- Disruptions and distracting behavior are unacceptable. Silence your cell phone (and all other devices) before class starts. Don’t read a newspaper, send text messages, surf the net, work a crossword puzzle, study for other classes, etc., during this class!
- You are responsible for everything discussed in class and all assigned reading (even for textbook topics not explicitly covered in class). Absence doesn’t excuse you from this responsibility. Your understanding of physics (and your grade) will suffer if you skip class or neglect the preparatory reading. If your schedule makes it difficult to attend class regularly and on-time, you shouldn’t take this course.
- You are responsible for the material covered in the assignments. I can’t emphasize enough the importance of homework! You will get very little learning value from homework if you procrastinate, or if you depend on the efforts of others.
- Attend your assigned lab section and follow the TAs’ instructions. Refer to the lab syllabus for more information. If you have lab-related questions, please see Mr. Tom Barnello in Room 310.
- Ask for clarification on anything you find unclear, ambiguous, or unspecified. This includes both course policies and physics topics. Ignorance is never a valid excuse.

## **Academic Honesty**

The University of Georgia has a comprehensive policy on academic honesty known as *A Culture of Honesty*. This policy not only describes required and prohibited conduct, as pertains to academic honesty, but also provides a detailed procedure for resolving matters of alleged academic dishonesty, including a description of consequences for honesty violations. The complete policy can be found online at <http://www.uga.edu/honesty/>. All students are responsible for knowing, understanding, and abiding by this policy. If you have any questions about the appropriateness of your work in this course, you are obligated to ask me for clarification.

I take issues of academic honesty very seriously, and it is my responsibility to uphold the University's policy. This means, among other things, that I will not hesitate to report my suspicions of dishonesty (*e.g.*, plagiarism, unauthorized assistance, etc.) to the Office of the Vice President for Instruction. This extends not only to exams but also to homework.