Introduction

Welcome to Physics 1111, 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 17th 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 will learn about the fundamental 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, and basic geometry, as well as an understanding of elementary science concepts (e.g., scientific notation, significant figures, units and dimensions, graphing). We will not be reviewing in detail this material in class. If you need to brush up, be sure to read Chapter 1 and Appendix A as soon as possible. Please come see me if you are concerned about your preparation for this course.

If you are a physics or astronomy major, or are considering those possibilities, then this course is probably not for you. Please talk to Prof. Wiegert (physics undergraduate coordinator) or Prof. Caillault (astronomy undergraduate coordinator) for help in exploring your options.

If you have had calculus or are taking it now, you should consider taking PHYS1211, which uses some calculus concepts, instead of this course. Newton developed calculus in the process of formulating his laws of motion; consequently PHYS1211 is both slightly more challenging and much more rewarding.

Basic Information

Instructor: Dr. Zhengwei Pan
Email: panz@uga.edu
Offices: 228D Physics Building& 223 Riverbend South Research Building (220 Riverbend Road)
Phone: 706-542-4657 (Riverbend office)
Class: Tuesday and Thursday, 5:00–6:15 PM, 202 Physics Building
Office Hours: Monday and Wednesday: 4:00-5:30 PM in R221
Lab: Start from the week of August 25–29, 314 Physics Building (read the online lab syllabus)
Lab Contact: Mr. Tom Barnello (tjbar@physast.uga.edu, 706-542-2903).
Required Course Materials

- *Experiments for an Introductory Physics Course, 5th ed.*, by R. M. Wood and S. P. Lewis. This will be used in your lab section.
- An Interwrite PRS RF response pad ("clicker"). Bring it to every class; we will be using clickers throughout the semester for participatory activities and quizzes.
- 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. The use of calculator graphing, algebra-solving, or programming functions will not be permitted for any exam, nor will PDAs, cellphones, etc.

Online Course Materials

- The course Website at [https://uga.view.usg.edu/](https://uga.view.usg.edu/) (or [http://elcnew.uga.edu](http://elcnew.uga.edu)) will be used to disseminate course information: announcement, homework solutions, exam solutions, etc.
- Online assignments are an essential part of the course. You will access them with an account on the LON-CAPA system at [http://spock.physast.uga.edu/](http://spock.physast.uga.edu/).
- You will be subscribed to a low-volume email announcement list. It is important that you check your email daily.

Other Student Resources

- 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.
- Tutors are available either through the UGA Tutoring Program at Milledge Hall, or directly through the Department of Physics and Astronomy

Grading Policy and Assignments

Your overall grade will be determined from your course performance, weighted as follows:

- 25% Final exam
- 35% Three mid-term exams (18%/12%/5% for the highest/middle/lowest grades)
- 20% Homework grade \[20 \times \text{(finished parts/total parts)}\%\]
- 5% In-class activities (class attendance; clicker)
- 15% Laboratory grade

Letter grades will be assigned from your overall numerical grade according to the following:

\[
\begin{align*}
90.0 & \leq A \\
87.5 & \leq A- < 90.0 \\
85.0 & \leq B+ < 87.5 \\
80.0 & \leq B < 85.0 \\
77.5 & \leq B- < 80.0 \\
75.0 & \leq C+ < 77.5 \\
70.0 & \leq C < 75.0 \\
67.5 & \leq C- < 70.0 \\
60.0 & \leq D < 67.5 \\
F & < 60.0
\end{align*}
\]
Overall numerical grades will not be rounded (i.e., 89.9 is still an A–).

Any requests for a regrade of an assignment or an exam must be made no later than one week after the item is returned. For a regrade I will look at the entire assignment/exam, not just one problem, and this may raise or lower your score. Regrade requests should be accompanied by all your work.

Exams

There will be three in-class midterm exams and a cumulative final exam. All exams will 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.) You are allowed to bring a formula sheet for each exam. No class examples and homework problems are allowed to appear on the formula sheet. The purpose of the formula sheet is to focus your studying on understanding rather than memorization.

Exams are designed to test your understanding thoroughly and to distinguish among levels of performance. 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. Detailed solutions will be posted to the Web after each in-class exam.

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 your one of your midterms, making your final exam worth 35% (25% + 10%) of your overall grade. 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 simply 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.

No curve will be given to the exams.

Homework

Regular, personal practice with physics problems is essential to understanding physics, so you will have weekly homework assignments. Assignments will be posted online (http://spock.physast.uga.edu/) and will generally be due within 7 days. The post and due dates will be announced in class. Most problems will require you to submit your answers on the Web. Detailed solutions will be posted to eLC Web (https://uga.view.usg.edu/) after the homework is due. Each assignment will be weighted equally. Responses will be graded for correctness, although for some problems incorrect responses may earn partial credit for the effort.

Late homework will not be accepted or excused.

Teamwork can be a very effective way to learn, so I encourage you to collaborate with your classmates on homework problems. However, don’t mistake teamwork for plagiarism; your solutions must be your own. Copying or paraphrasing from someone else’s work, or from any
source of homework solutions, is a violation of academic honesty policies.

Since you can’t collaborate on exams, homework is your best opportunity to develop your own problem-solving skills. If you’ve read this far in the syllabus, please put a star next to your signature on the questionnaire.

**Reading Request**

You are required to read the related textbook sections *before* the class in which those topics are discussed. Regular reading is an important part of your preparation for class. Don’t expect to understand everything in the textbook at first sight! However, your ability to learn effectively in class will depend on having encountered the material prior to class. You should jot down notes and questions as you read; this will aid in organizing your class notes and will remind you to ask for clarification.

**Class Activities**

Throughout the semester, you will be asked in class to answer conceptual and quantitative questions, both individually and in small groups, and often using the “clickers”. The supported clicker is called the *Turning Technologies Response Card NXT*. Your responses will be used to count the class attendance. These activities allow you to demonstrate your sincere effort and active engagement in the class.

At the end of the semester, the results of these exercises will be a component of your overall grade.

**Extra Credit**

*There is no extra credit* in this course.

**Academic Honesty**

*As a University of Georgia student, you have agreed to abide by the University’s academic honesty policy, “A Culture of Honesty,” and the Student Honor Code. All academic work must meet the standards described in “A Culture of Honesty” found at: www.uga.edu/honesty. Lack of knowledge of the academic honesty policy is not a reasonable explanation for a violation. Questions related to course assignments and the academic honesty policy should be directed to the instructor.*

I take the issue of academic honesty very seriously, and it is my responsibility to uphold the University’s policy. This means, among other things, that I won’t hesitate to report my suspicions of dishonesty to the Office of the Vice President for Instruction. Typical consequences of cheating on homework or an exam range from receiving a zero for that grade, to failing the course.

**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 or distracting behavior will not be tolerated.

- You’re responsible for all topics discussed in class, all class announcements, and all assigned textbook reading (even if some sections aren’t explicitly covered in class). Absence doesn’t excuse you from this responsibility, and your understanding of physics (and your grade) will suffer if you
skip class. If your schedule makes it difficult to attend class regularly and on-time, you shouldn’t take this course.

- You’re responsible for the material covered in the assignments. I can’t emphasize enough the importance of homework! Just as with other areas of learning, your physics problem-solving skills will improve only by practicing regularly and conscientiously. You won’t get much learning value from homework if you leave it for the last minute, or 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 327.

- 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.

- Know the policies in the Undergraduate Bulletin concerning withdrawals and incompletes. The following passage is particularly important:

  Students are limited to four withdrawals during their undergraduate careers. . . . Students who fail to drop a course or wish to withdraw from a course after the designated drop/add period for a term must withdraw through OASIS (Online Access to the Student Information System). An instructor also may withdraw a student from a course due to excessive absences as defined in the course syllabus. Withdrawals after the drop/add period will result in course entries on the academic record with grades of WP or WF as assigned by the instructor(s). A student who withdraws or is withdrawn for excessive absences after the withdrawal deadline of the semester is assigned a grade of WF except when the student is doing satisfactory work and Student Support Services is able to approve the withdrawal because of a hardship situation.

  For withdrawals before the midpoint, I will enter a grade of WP even for technically failing grades, if I judge that you have made a sincere, significant effort in the class. It is possible to earn a grade of WF before the midpoint; don’t assume otherwise! You are expected to officially withdraw in a timely fashion once you have made that decision.

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

**Notes:**

The course syllabus is a general plan for the course; deviation announced to the class by the instructor may be necessary.

Students with disabilities who require reasonable accommodations in order to participate in course activities or meet course requirements should contact the instructor or designate during regular office hours or by appointment.
TIPS: HOW TO DO WELL IN THIS CLASS?

- GOALS: What we would like to be able to do in this class is four-fold:
  1. To apply basic physical principles to realistic situations.
  2. To solve realistic problems.
  3. To perceive and/or resolve contractions involving our, deeply rooted in intuition, preconceptions.
  4. To organize the ideas of physics hierarchically

- There is no easy, a walk-in-the-park-sort-of way to achieve that.

- SURPRISE: Educational research has consistently shown that lectures alone are generally inefficient in conveying information to most students, and are even less effective in teaching reasoning skills.

- Active learning is the key to success in physics.

- No matter how good the text is, no matter how well the course is designed, our effort to learn physics effectively will fail if you do not come to class prepared. Such preparation includes, among other things, reading and thinking about the subject ahead of time.

- Do not expect to understand everything you read; however, you do have to make an honest effort.

- When you read your text, make notes, record questions, and ask your questions in class. Also...

- ATTENTION! ...learn how to separate important from unimportant. Some authors go on a tangent ranting about unimportant details. Your task, while reading, is to drop the water and keep the substance!

- You must solve problems, all the time, as many as you possibly can.

- REMEMBER: You can no more learn to think like physicists simply by listening to the lecture than someone can become a pianist simply by listening to a pianist play, which means that...

- ...listening is no replacement for personal practice.

- Thus, practice! Solve problems!

- IMPORTANT: reading a section ahead of time prepares you for the unexpected. By knowing what to expect you eliminate the need to frantically write down everything your teacher says in class. Instead, you will be spending your precious time actively thinking about the topic and recording only those things that matter most.
The schedule below is approximate and subject to modification, possibly including exam dates. Significant changes in the schedule or the assigned reading will be announced in class. Note that the withdrawal deadline is October 23, 2014.

<table>
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<th>Class</th>
<th>Date</th>
<th>Reading</th>
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<td>3</td>
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<td>Final Exam, 7:00-10:00pm in R202</td>
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Tu-Tuesday, Th-Thursday.