Introduction
Welcome to Physics 1251! This course is the first half of the introductory physics sequence for engineering students. This semester focuses 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.

Objectives
The primary objective of this course is to engage you in a process that is central to physics: *Modeling physical phenomena by applying a small set of fundamental principles*. The modeling process encompasses explaining and predicting physical behaviors; making appropriate approximations and simplifications for complicated physical systems; and communicating results through mathematical and numerical expressions, diagrams and visualizations, graphs, and even “plain English.”

We’ll be applying the fundamental principles of mechanics to many different kinds of motion: constant-force motion, uniform circular motion, statics (lack of motion), collisions, rotations, oscillations, and wave motion.

If you are a prospective physics or astronomy major, then this course is probably not for you. Please talk to Dr. Wiegert (physics) or Dr. Caillault (astronomy) about other options.

Prerequisites/Corequisites
In order to do well in this course, you should be comfortable with college algebra, trigonometry, and plane geometry. You should also have an understanding of some elementary science concepts such as scientific notation, significant figures, units and dimensions, and graphing. A prior high school physics course is useful, but not required.

Some differential calculus will be used in the course. It is important that you be registered for the first semester of the calculus sequence (Math 2250 or equivalent), if you haven’t already taken it.

Basic Information
Instructor: Dr. Benjamin Cooley
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Phone: 706-542-3909

Final Exam: Thursday 11 December, 12:00–3:00 pm, 303 Physics Bldg
HW Clinic: (optional) TBA
Office hours: TBA
Course Resources

Required Materials

- *Physics for Scientists and Engineers, Volume 1*, 5th or 6th ed., by Tipler and Mosca (WH Freeman). Online or print version.
- *smartPhysics* online system, by Gladding, Selen, and Stelzer. Bundled with Tipler textbook. This will be used primarily for preparing for class. Use course access key 4af5aa5e to enroll online at https://www.smartphysics.com/
- A Turning Technologies ResponseCard NXT (“clicker”). Bring it to every class; we will be using clickers throughout the semester for participatory activities.
- A scientific calculator. A simple calculator such as the TI-30X series will do just fine, but a fancier graphing calculator is also acceptable.

Online Resources

- Your UGA email account will be subscribed to a low-volume announcement list. It is important that you check your email daily.
- The eLearning Commons (http://elc.uga.edu/) will serve as the central online location for course information: homework and exam solutions, grades, etc.
- Online assignments, both before and after class, are an essential part of the course. You’ll complete this work both within smartPhysics and on the LON-CAPA homework system at https://spock.physast.uga.edu/, using your UGA MyID and password.

Other Resources

- Office hours are your chance to get one-on-one or small-group help with homework assignments or with understanding topics from class. Please make use of this time; I can’t address your questions if you don’t ask!
- If you can’t 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 Academic Resource Center at Milledge Hall, or through the Department of Physics and Astronomy.

Grading Policy and Assignments

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

- 20% Cumulative final exam grade
- 45% Three in-class exams (20%/15%/10% for highest/middle/lowest grades)
- 10% Homework grade
- 15% Laboratory grade (including lab final worth 30% of total)
- 5% In-class participation
- 5% Pre-class preparation

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

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<th>Grade</th>
<th>Numerical Grade</th>
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<tbody>
<tr>
<td>A</td>
<td>90.0</td>
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<td>A–</td>
<td>87.5</td>
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<td>B+</td>
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<td>B</td>
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<td>B–</td>
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<td>C+</td>
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<td>C</td>
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<td>C–</td>
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<td>D</td>
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<td>F</td>
<td>59.99 or below</td>
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Overall numerical grades will *not* be rounded (i.e., 89.99 is still an A–).
Any requests for a regrade of an assignment or exam must be made no later than one week after it's 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 (including those for online homework) should be accompanied by all your work.

Like any other measurement, grades possess a degree of uncertainty. Factors such as improvement, effort, and participation may help borderline grades. Lobbying, however, will not, and requests for extra credit will be ignored, so don’t ask!

**Exams**

All exams will be closed-book and closed-notes. You may use a scientific calculator for arithmetic only, not for algebra, calculus, or graphing; all memory and programs must be cleared. We’ll provide you with a formula sheet for each exam, and will also post it to the Web before the exam. The formula sheet’s purpose is to focus your study on understanding rather than memorizing.

Exams will comprise both conceptual and problem-solving questions, 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.

Exams are designed to test your understanding thoroughly and to distinguish among levels of performance. In order for exams to be effective assessments, raw scores will often be lower than the expectations created by the “standard” letter grade cutoffs. These raw scores will be “rescaled” into numerical grades. This conversion is based mostly on the difficulty level of the exam and partly on the distribution of raw scores. Your rescaled grade will never be lower than your raw score. Also, unlike a “grade curve”, you are not competing against your peers; it is possible for everyone to get an A or B, for example.

*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 30-40% 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 us 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 and nature 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 legitimate, documentable reasons as explained above.
Homework
Sustained practice with physics problems is crucial to understanding physics, so you will have regular homework assignments. Assignments will be posted online through smartPhysics and LON-CAPA, and most problems will require you to submit your answers online. However, a few assignments may also have a handwritten component. Detailed solutions will be posted to the Web after the due date.

Assignments will be weighted equally unless otherwise specified. At the end of the semester, provided that you complete a course evaluation, we will drop your lowest two assignment percentages in calculating your overall score. (If you don’t submit a course evaluation during the allotted time, then none of your assignments will be dropped.) This dropped-assignment policy compensates for the unavoidable circumstances that may occasionally prevent you from submitting homework on time (e.g., illness, scheduled event, Internet failure, etc.). Late homework won’t be accepted or excused. However, even if you miss the deadline to submit homework answers for credit, you should still make every effort to work through all the problems on every assignment, in order to master the topics covered. You will likely do very poorly on exams if you don’t work through each assignment in its entirety.

Teamwork is an effective way to learn, so we encourage you to collaborate with your classmates. Ask them questions; critique others’ work; explain your reasoning to your study partners. However, don’t mistake teamwork for plagiarism. You’re responsible for understanding all the details of every solution, and your solutions must be your own. Copying 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 printed name on the agreements form.

Labs
Lab activities will usually take place during the longer class on Thursdays, although you might also perform “mini-labs” during some other classes. Lab work is a group effort; your group will hand in one report to be graded as a team. Because teamwork is so important to the success of labs, there are no make-up labs, and group members who are absent will receive a grade of zero for that lab. However, just as with homework, your two lowest lab scores will be dropped at the end of the semester for completing the course evaluation. Your lab grade will include a lab final exam.

Class Preparation
Your preparation before class is essential, and will affect how well you learn in class. You will be expected to read the textbook and watch short pre-class videos on a regular basis, and you’ll answer a few questions before class based on these materials to gauge your understanding.

In-Class Activities
You will often be asked in class to work on conceptual and quantitative questions, both individually and in small groups, and often using the “clickers”. These activities allow you to demonstrate your sincere effort and active class engagement.
A fraction of these in-class activity scores will be “dropped” (similar to the fraction of dropped homework assignments) to compensate for the occasional absence, clicker malfunction, or similar issue. I will not accept a written record of your responses as a clicker substitute, or otherwise excuse any absence from class.

Academic Honesty

The University of Georgia has a comprehensive academic honesty policy described in the document *A Culture of Honesty*, which is available through the Office of the Vice President for Instruction or at [http://www.uga.edu/honesty/](http://www.uga.edu/honesty/). This policy covers all academic work.

As a UGA student, you are responsible for knowing and understanding this policy. If you have any question about the appropriateness of your actions or your work, you’re obligated to ask us for clarification.

We take the issue of academic honesty very seriously, and it’s our responsibility to uphold the University’s policy. This means, among other things, that we won’t hesitate to report 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.

Technology Policy

Cell phones should be turned to silent or off during class. Texting, checking email, posting to Facebook, etc. are not allowed during class. These activities are distracting and disrespectful to your fellow students. Tablet computers and convertible laptops in tablet mode may be used with a stylus for the purpose of taking notes. Typing notes on a traditional laptop is not very effective for a class like this, because of the large number of diagrams, graphs, and equations required.

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.

- **Attendance is required.** Class attendance keeps you well connected to the course and to the members of your group. In physics courses, each new concept builds on earlier ones, so mastering key concepts is critical. If your schedule makes it difficult to attend class regularly and on-time, you shouldn’t take this course.

The most common causes of missed classes are lack of sleep and time pressure from other obligations. If this happens to you, you need to seek out advice on how to set priorities and manage your time effectively.

If you miss class, it’s your responsibility to find out what you missed. Talk to your groupmates, and notify them of your absence in advance if possible. They’re relying on you to be caught up by the time you return to class.

- We 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’ll get very little value out of homework if you procrastinate, or if you depend on the efforts of others. If you start to get behind, get help early before the problem gets worse!

- 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, we will enter a grade of WP even for technically failing grades, *if* we 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!

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.

**Disclaimer:** This syllabus is subject to change if circumstances dictate. Changes will be announced in class and on the class email list.