Introduction
Welcome to Physics 1311! This course is the first half of the introductory physics sequence for prospective physics or astronomy majors (although not exclusively). 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 at both the microscopic and macroscopic level: constant-force motion, uniform circular motion, statics (lack of motion), collisions, rotations, oscillations, wave motion, and heat (thermal motion).

Detailed learning objectives will be provided for each major topic of the course. You will explicitly practice these objectives in and out of class, and they will form the basis of exams.

Prerequisites
In order to do well in this course, you should be comfortable with college algebra, trigonometry, plane geometry, and basic differential calculus. You should also have at least some 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.

Computer modeling is a part of this course, but no prior computer programming experience is required.

Basic Information

<table>
<thead>
<tr>
<th>Instructor:</th>
<th>Dr. Craig Wiegert</th>
<th>Email: <a href="mailto:wiegert@physast.uga.edu">wiegert@physast.uga.edu</a></th>
</tr>
</thead>
<tbody>
<tr>
<td>Office:</td>
<td>215 Physics Building</td>
<td>Phone: 706-542-4023</td>
</tr>
<tr>
<td>Class:</td>
<td>MWF Period 2 (9:05–9:55), 302 Physics Building</td>
<td></td>
</tr>
<tr>
<td>Lab:</td>
<td>W Periods 7–8 (2:30–4:25), 302 Physics Building</td>
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<tr>
<td>Final Exam:</td>
<td>Monday, 7 May, 8:00–11:00 am, 302 Physics Building</td>
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<tr>
<td>Office hours:</td>
<td>TBA</td>
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Course Resources

Required Materials

• *Matter and Interactions I: Modern Mechanics*, 3rd ed., by Chabay and Sherwood (Wiley). The text is also available in an eBook format; details will be posted to eLC.

• 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

• 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/) (backup server at [http://tuvok.physast.uga.edu/](http://tuvok.physast.uga.edu/)).

• You will be subscribed to a low-volume email announcement list. It is important that you check your email daily.

• The eLearning Commons will serve as another repository of course information: homework and exam solutions, grades, etc.

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 UGA Tutoring Program 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)
- 15% Homework grade
- 15% Laboratory grade
- 5% Participation: in-class activities, reading quizzes, etc.

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

- **A**  90.0  **A–**  87.5  **B+**  85.0  **B**  80.0  **B–**  78.5  **C+**  75.0  **C**  70.0  **C–**  67.5  **D**  60.0  **F**

Overall numerical grades will *not* be rounded (i.e., 89.99 is still an A–).
The final exam is your opportunity to demonstrate that you have broadly and coherently mastered the course material. Therefore, if

- you haven’t missed any midterm exams
- your total midterm exam grade is at the passing level
- your homework grade is also at the passing level

then your final exam grade (if higher) will replace your overall exam grade.

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. I’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.

If you need to miss an exam for any reason, you must contact me before the exam if at all possible, or else as soon as possible after the exam. Make-up exams will be given only for legitimate, documentable reasons and only if you notify me 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.*
**Homework**

Sustained practice with physics problems is crucial to understanding physics, so you will have regular homework assignments. Assignments will be posted online through LON-CAPA. Work each problem carefully and in detail on paper. Many problems will allow you to submit answers online, although some will be purely handwritten. Detailed solutions will be posted to the Web after the due date.

Written portions of assignments should be handed in to me directly or put into my mailbox in the main office, Room 201. *(Do not slide anything under my office door.)* Written work will be graded not just for the correctness of the end result, but for clarity and completeness of the entire problem-solving process.

Assignments will be weighted equally unless otherwise specified. I will drop your lowest two assignment percentages in calculating your overall score, *with the additional requirement* that you complete the course evaluation at the end of the semester. 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 I encourage you to collaborate with your classmates. Ask them questions; critique others’ write-ups; 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.

**Reading Assignments and Quizzes**

Regularly reading the textbook and working through its sample exercises is an essential part of your preparation for class. I don’t expect you to understand everything in the textbook at first sight. However, your ability to learn during class will depend on having already encountered the material prior to class. You should jot down notes and questions as you read; this will help organize your class notes and will remind you to ask for clarification.

**Class Activities**

You will often be asked in class to answer conceptual and quantitative questions, both individually and in small groups, and often using the “clickers”. Your responses will be graded primarily on participation, although correct responses will receive a small bonus. These activities allow you to demonstrate your sincere effort and active class engagement.

At the end of the semester, the results of these exercises will be combined with any reading quiz scores as a component of your overall grade. As with homework scores, a comparable fraction of the activities and quizzes will be “dropped” to compensate for the occasional absence or problem with your clicker. 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 are obligated to ask me for clarification.

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.

- **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 you start to get behind, get help right away before the problem gets worse!

  The most common causes of missed classes are lack of sleep and pressure from other obligations. If this happens to you, you need to get help in setting priorities and managing your time effectively. If your schedule makes it difficult to attend class regularly and on-time, you shouldn’t take this course.

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

- **You must** regularly read the textbook to prepare for class. Class time is valuable and limited. Using that time effectively requires that you’ve had some exposure to the necessary concepts through your reading, so that you can ask good questions and practice applying those concepts in class. Also, *class discussion will not cover all of the assigned material.*

- **You’re responsible** for the material covered in 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’ll get little or nothing out of homework if you procrastinate, or if you depend on the efforts of others.

- **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!* 

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.
## PHYS 1311 Class Schedule
### Spring 2012

This is a brand-new course approach, with a new edition of an unconventional textbook; because of this combination of factors, the schedule below is necessarily only an approximation. Parts of it are subject to change, *possibly including exam scheduling.*

Note that the midpoint withdrawal deadline is Thursday, 22 March.

<table>
<thead>
<tr>
<th>Topic</th>
<th>Duration</th>
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<tbody>
<tr>
<td>Introduction: Interactions and Motion</td>
<td>2 weeks</td>
</tr>
<tr>
<td>Momentum Principle</td>
<td>3 weeks</td>
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<tr>
<td><strong>Exam 1</strong></td>
<td>Chapters 1–4</td>
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<tr>
<td>Energy Principle</td>
<td>3 weeks</td>
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<tr>
<td><strong>Exam 2</strong></td>
<td>Chapters 5–8</td>
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<tr>
<td>Multiparticle Systems and Collisions</td>
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<td><strong>Exam 3</strong></td>
<td>Chapters 9–10</td>
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<tr>
<td>Angular Momentum Principle</td>
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<tr>
<td>Entropy</td>
<td>1 week</td>
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