PHYS 1251 Syllabus

University of Georgia, Fall 2017

Version 1

Contents of this syllabus are subject to change. You will be notified of any changes, and a new version of this document will be posted online.

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. Jarrad Pond	Email: `jarrad.pond@uga.edu`
Office:	234 Physics Building	
Class:	303 Physics Building	
	Mon. and Fri., 2:30 pm – 3:20 pm; Wed. 2:30 am – 4:25 pm	
Final Exam:	T.B.A.	
Office hours:	Mon., 3:30 pm – 5:00 pm; Tue., 10:00 am – 11:00 am or by appointment	

Course Resources

Required Materials

- *FlipItPhysics: Classical Mechanics*, by Gladding, Selen, and Stelzer (WH Freeman). As bundled in the bookstore, this is an online resource system combined with a textbook *Physics for Scientists and Engineers, Vol. 1*, 6th edition, by Tipler and Mosca. Use course access key **jp1251F17** to enroll online. You will use this material primarily to prepare for class.
- A Turning Technologies response device or ResponseWare app ("clicker"). Bring it to every class; we will be using clickers throughout the semester for participatory activities. A Turning Account license is also required. Instructions for setting up an account can be found at `http://www.ctl.uga.edu/turningpoint/students`.
- 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 your responsibility to be informed of all announcements sent via this email list: check your UGA email daily!
- The eLearning Commons will serve as a repository of course information: homework and exam solutions, grades, announcements, etc.
- Online assignments, both before and after class, are an essential part of the course. You'll complete this work both within FlipItPhysics and on the LON-CAPA homework system at `https://spock.physast.uga.edu/`.

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 and Miller Learning Center, or through the Department of Physics and Astronomy.

Grading 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
5% In-class participation
5% Pre-class preparation

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**– 77.5 **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–).

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 eLC 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 eLC 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 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 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.

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 and/or FlipItPhysics, 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 eLC 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*, I 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 I 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 have gotten this far in the syllabus, draw a tree next to your signature on the introductory questionnaire and syllabus comprehension form. Don't discuss this with your classmates. Let's see if they read the syllabus thoroughly too.

Labs

Lab activities will usually take place during the longer class on Wednesdays, 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, as with homework, your single lowest lab score will be dropped at the end of the semester for completing the course evaluation.

Class Preparation

Pre-class lecture video viewing and textbook reading take the place of in-class lectures. This preparation *before* class is essential for you to learn well *in* class, just as it would be for a literature course. You'll regularly 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.

During in-class activities, no off-task use of cellphones, iPads, iPods, or any other electronic/communication devices is permitted in the classroom. We have a very limited amount of time in our classes and it is detrimental to spend it distracted.

Course Policies

Academic Honesty

UGA has a comprehensive academic honesty policy, *A Culture of Honesty*, which is available from the Office of the Vice President for Instruction at `http://honesty.uga.edu/`. This policy covers all academic work. All students are responsible for fully understanding and abiding by this policy. If you have *any* questions 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 evidence of dishonesty to the Office of the Vice President for Instruction. Typical consequences of academic dishonesty on homework or an exam range from receiving a zero for that grade, to failing the course, to being suspended from UGA.

Disability Accommodations

I will make every reasonable effort to accommodate students with documented disabilities. Students requesting accommodations must provide documentation from the Disability Resource Center during the first two weeks of class (or within two weeks of DRC certification).

Withdrawals/Incompletes

The Undergraduate Bulletin and the Registrar's Office website describe the University policies regarding withdrawals and incompletes (`http://reg.uga.edu/policies/withdrawals`). 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, I may withdraw you from the course for "excessive absence".

If you are considering withdrawing from the course, you should discuss your choice with me beforehand. In many cases, students are doing better in the course than they think they are.

A grade of Incomplete is not appropriate for a student who has missed a large portion of the course assessments, for whatever reason.

Student Distress

If your course performance is significantly affected by issues beyond your control, I urge you to let me know and to seek assistance promptly from the Office of Student Support Services. It is always easier to address exceptional circumstances when you raise these concerns as early as possible. Waiting until the end of the semester to take action may limit my ability

to provide appropriate support.

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 interact, and able to ask or answer questions freely. Courtesy also implies that you arrive on time, stay until the end of class, and remain focused during 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 starts happening 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 from other students 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.
- You *must* prepare for class. Class time is valuable and limited. Using that time effectively requires that you've had some exposure to the necessary concepts, so that you can ask good questions and practice applying those concepts in class. Evidence from other courses with this format suggests that the time you spend preparing for class *significantly* reduces the amount of time needed for homework. Finally, *class discussion will not cover all of the assigned material.*
- It's your responsbility to show me what you do and don't understand through your questions, so that I can help you learn. You help influence the pace of the course. Silent confusion benefits no one.
- 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 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.