PHYS 1111 Syllabus

The University of Georgia, Fall 2009

MWF, Periods 6 (1:25–2:15) and 7 (2:30–3:20)

Dr. Jeremy Gulley

http://www.physast.uga.edu/classes/phys1111/jgulley/

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'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—Newtons 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, oscillations, and wave motion.

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 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 prospective physics or astronomy major, then this course is probably not for you. Please talk to Prof. Wiegert (physics) or Prof. Caillault (astronomy) about other options. If you have had calculus or are taking it now, consider taking PHYS 1211, which uses some calculus concepts, instead. Newton developed calculus while formulating his laws of motion; consequently PHYS 1211 is both slightly more challenging and much more rewarding.

Basic Information

Instructor:	Dr. Jeremy Gulley	Email:	jgulley@physast.uga.edu
Office:	220 Physics Building	Phone:	(706) 542-3948

Class:	MWF Periods 6 and 7 (1:25–2:15 pm and 2:30–3:20 pm), 202 Physics Building
Lab:	Various times, 314 Physics Building
Final Exam:	Monday 14 December, 7:00–10:00 pm, Location TBD
Clinic:	(optional) Monday 5:00-6:30 pm (Room 202)
Office hours:	Monday 4:00–5:00 pm, Wednesday 4:00-5:00 pm, Friday 9:30-11:30 am

Required Course Materials

- *Physics, Volume 1*, 3rd ed., by J. S. Walker (Pearson Prentice Hall). This is the "blue cover" edition. You may use older editions (white or red covers) or the newer 4th ed. if you wish, but you are responsible for knowing about any changes in content.
- *Experiments for an Introductory Physics Course*, 6th ed., by R. M. Wood and S. P. Lewis. This will be used in your lab section.
- An Interwrite PRS RF response pad (the "clickers"). Bring this to every class; we will be using them 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. The use of calculator graphing, algebra-solving, or programming functions will *not* be permitted for any exam, nor will PDAs, cellphones, etc.

Online Course Resources

- The course Website at http://www.physast.uga.edu/classes/phys1111/jgulley/ will be used to disseminate course information: homework assignments, exam solutions, practice problems, 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/.
- You will be subscribed to a low-volume email announcement list. It is important that you check your email daily.
- Grade information will be made available through WebCT.

Other Student Resources

- Optional weekly homework clinics will give you and your classmates an opportunity to work on problems in small groups. I will be on hand to answer 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.
- The textbook publisher has a companion Website for an earlier edition, at the URL http://www.prenhall.com/Walkerphysics/. This site contains summaries and practice problems for each chapter, and is a good way to increase your confidence and familiarity with the material.
- There is a Student Study Guide with Selected Solutions for this textbook that may be useful, although students have given this guide mixed reviews. Information on this and other resources is provided in your textbook.
- 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:

20% Cumulative final exam grade
45% Three in-class exams (20%/15%/10% for highest/middle/lowest grades)
15% Laboratory grade
15% Homework grade
5% Reading quizzes and in-class activities

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., 89.9 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 (including those for online homework) 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.*) I'll provide you with a formula sheet for each exam, and will also post it to the Web before the exam. The purpose of the formula sheet is to focus your studying on understanding rather than memorization. If you feel 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.

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.

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 exam scores will be converted into "rescaled" numerical grades. This conversion is based partly on the distribution of raw scores, but also on the difficulty level of the exam. A rescaled numerical grade will *never* be lower than your raw score. Also, unlike a typical 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 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.

Homework

Regular, personal practice with physics problems is essential to understanding physics, so you will have at least one, sometimes two, homework assignments per week. The assignments will generally be due once a week, although class pacing and scheduling may necessitate different due dates, which will be announced in class. Assignments will be posted online, and most problems will require you to submit your answers on the Web. However, some assignments may also have a handwritten component, which you should hand in to me directly or put into my mailbox in the main office, Room 201. (*Do not* slide anything under my office door.)

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. Problems that are to be handed in on paper must show all work legibly in order to receive credit.

I will drop your lowest two assignment percentages in calculating your overall score. Again, this 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 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. That is in fact a goal of the optional weekly clinics. 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.

Reading Quizzes

You are required to read the assigned textbook sections *before* the class in which those topics are discussed. I will regularly assign short, multiple-choice online quizzes based on the reading material. Each quiz will be posted to the Web on the day before the class it pertains to, if not earlier. You must complete the quiz by 1:00 pm on the day of the corresponding class.

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 learning effectiveness *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 usually 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 engagement in the class.

At the end of the semester, the results of these exercises will be combined with your 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 "clicker" problem.

Extra Credit

There is no extra credit in this course.

Academic Honesty

The University of Georgia has a comprehensive policy on academic honesty, described in a document entitled *A Culture of Honesty*. This document is available through the Office of the Vice President for Instruction or online at `http://www.uga.edu/ovpi/`. 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. 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 does not excuse you from this responsibility. While attendance is not strictly mandatory, 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 are 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 concerning withdrawals and incompletes, published in the UGA *Undergraduate Bulletin*. Of particular importance is the following passage:

  > 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), you may be withdrawn from the class.

PHYS 1111 Class Schedule
Fall 2009

The schedule below is approximate and subject to modification, *possibly including exam dates*. Significant schedule changes will be announced in class. Note that the midpoint withdrawal deadline is the 22nd of October.

Class	Date	Reading	Topic
1	M 17 Aug	(1.1–1.8)	Course Intro
2	W 19 Aug	2.1–2.3	1D Kinematics
3	F 21 Aug	2.4–2.5	1D Kinematics
4	M 24 Aug	2.6–2.7	1D Kinematics
5	W 26 Aug	3.1–3.3	Vectors
6	F 28 Aug	3.4–3.5	Vectors
7	M 31 Aug	3.6	Relative Motion
8	W 2 Sept	4.1–4.2	2D Kinematics
9	F 4 Sept	4.3–4.4	2D Kinematics
	M 7 Sept		LABOR DAY
10	W 9 Sept	4.5	2D Kinematics
11	F 11 Sept	5.1–5.3	Newton's Laws and Forces
12	M 14 Sept	5.4–5.5	Newton's Laws and Forces
13	W 16 Sept	5.6	Newton's Laws and Forces
14	F 18 Sept		**EXAM #1**, Chapters 1–4
15	M 21 Sept	6.1–6.2	Friction, Springs
16	W 23 Sept	6.3–6.4	Equilibrium
17	F 25 Sept	6.5	Circular Motion
18	M 28 Sept	7.1–7.2	Work and Energy
19	W 30 Oct	7.3–7.4	Work and Energy
20	F 2 Oct	8.1–8.2	Conservation of Energy
21	M 5 Oct	8.3–8.4	Conservation of Energy
22	W 7 Oct	8.5	Conservation of Energy
23	F 9 Oct	9.1–9.3	Momentum and Impulse
24	M 12 Oct	9.4–9.5	1D Collisions
25	F 14 Oct	9.6–9.7	2D Collisions, Center of Mass
26	W 16 Oct		**EXAM #2**, Chapters 5–8
27	M 19 Oct	10.1–10.2	Rotational Kinematics
28	W 21 Oct	10.3–10.4	Rotational Kinematics
29	F 23 Oct	10.5–10.6	Rotational Kinematics
30	M 26 Oct	11.1–11.2	Rotational Dynamics
31	W 28 Oct	11.3–11.4	Static Equilibrium
	F 30 Oct		FALL BREAK

Class	Date	Reading	Topic
32	M 2 Nov	11.5	Rotational Dynamics
33	W 4 Nov	11.6–11.7	Angular Momentum
34	F 6 Nov	11.8, 12.1	Rotational Work, Gravitation
35	M 9 Nov	12.2–12.3	Gravitation
36	W 11 Nov	12.4–12.5	Gravitation
37	F 13 Nov	13.1–13.2	Simple Harmonic Motion
38	M 16 Nov	13.3–13.4	Simple Harmonic Motion
39	W 18 Nov	13.5–13.6	Simple Harmonic Motion
40	F 20 Nov		**EXAM # 3**, Chapters 9–12
	M 23 Nov		THANKSGIVING
	W 25 Nov		THANKSGIVING
	F 27 Nov		THANKSGIVING
41	M 30 Nov	14.1–14.3	Waves and Sound
42	W 2 Dec	14.4–14.5	Waves and Sound
43	F 4 Dec	14.7–14.8	Superposition and Interference
44	M 7 Dec	14.9	Superposition and Interference
45	T 8 Dec		Course Review
	M 14 Dec		**FINAL EXAM**, 7:00–10:00 pm