PHYS 1111 Syllabus

University of Georgia, Spring 2007

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

Introduction

Welcome to Physics 1111. This course is the first half of a two-semester introductory physics sequence. This semester we will 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, oscillations, and wave motion.

Physics is a quantitative science. While we will not neglect the qualitative and conceptual aspects of Mechanics, much of the work in this course involves setting up and solving math problems. You will also need to be able to communicate these 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 physics or astronomy major, or are considering those possibilities, then this course is probably not for you. Please talk to Prof. Geller (physics) or Prof. Shaw (astronomy) for help in exploring your options.

If you have had calculus or are taking it now, you should consider taking PHYS 1211, which uses some calculus concepts, instead of this course. Newton developed calculus in the process of formulating his laws of motion; consequently PHYS 1211 is both slightly more challenging and much more rewarding.

Basic Information

Instructor:	Dr. Craig Wiegert	Email:	wiegert@physast.uga.edu
Office:	240 Physics Building	Phone:	542-4023

Class:	MWF Periods 4 or 7 (11:15–12:05 or 2:30–3:20), 202 Physics Building
Lab:	Various times, 314 Physics Building
Final Exam:	Friday 4 May, 7:00–10:00 pm, location TBA (mass final)
HW Clinic:	(optional) TBA
Office hours:	TBA

Required Course Materials

- *Physics, Volume 1*, 3rd ed., by J. S. Walker (Pearson Prentice Hall). This is the "blue cover" edition. It is acceptable to use the first or second editions (white or red covers), but you are responsible for knowing about any changes in content.
- *Experiments for an Introductory Physics Course*, 5th ed., by R. M. Wood and S. P. Lewis. This will be used in your lab section.
- A CPSrf response pad ("clicker") from eInstruction. Bring this to every class; we will be using them throughout the semester for participatory learning 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 Materials

- The course Website at `http://www.physast.uga.edu/classes/phys1111/wiegert/` will be used to disseminate course information: homework assignments and solutions, 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.

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 Web site for the first 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. Information on this and other resources is provided in your textbook.
- Tutors are available either through the UGA Tutorial Program at Milledge Hall, or directly through the Department of Physics and Astronomy.

Grading Policy and Assignments

At the end of the semester, your overall grade will be determined from your performance on exams, assignments, and labs, weighted as follows:

25% Cumulative final exam grade
45% Three in-class exams (20%/15%/10% for highest/middle/lowest grades)
10% Laboratory grade
15% Homework grade
5% Reading quizzes

Letter grades will be assigned from your overall numerical grade percentage as follows:

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–).

Despite the firm cutoffs mentioned above, a "curve" of sorts will apply to exam grades. Because exam scores rarely correspond to the standard letter grade cutoffs, each raw exam score will be converted into a rescaled numerical grade, guided by the mean and standard deviation of the raw score distribution. It is these rescaled grades that are used to calculate an overall grade. A rescaled numerical grade will *never* be lower than your raw score. Other components of your grade (labs, homework assignments, reading quizzes) will not be rescaled.

Any requests for a regrade of an assignment or an exam must be made no later than one week after the item is returned. Keep in mind that for a regrade I will look at the entire assignment/exam, not just one problem, and 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, as well as 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 will provide you with a formula sheet for each exam, and will also put it on the course Website prior to the exam. The purpose of the formula sheet is to focus your studying on understanding rather than memorization. If you feel that you need an equation that is not on the sheet, don't just 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 exam problem in order to receive full credit. Partial credit is awarded (based on your work) for incomplete or incorrect answers, so it is almost always in your best interest to attempt every problem. Detailed exam solutions will be posted to the course Web site after each in-class exam has been graded.

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 usually be lower than the expectations created by the "standard" grade cutoffs. The numerical grade rescaling is designed to map your performance onto the standard grade cutoffs.

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 "lowest" midterm, making your final exam worth 35% 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.

Homework

Weekly homework assignments will generally be due every Thursday. The pace of the class and changes to the schedule 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 ask you to turn in handwritten work; in this case, hand in your assignments to me directly or place them in my mailbox in the main office (Room 201). *Do not* slide anything under my office door. Detailed solutions will be posted to the Web site 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. Problems that are to be handed in on paper must show all work legibly in order to receive credit.

Your lowest two assignment percentages will be dropped 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; the solutions you hand in *must be your own*, not copied or paraphrased from someone else's work. Remember that you can't collaborate on exams; homework is your opportunity to develop your own problem-solving skills.

Reading Quizzes

You are expected to read the assigned textbook sections *before* the class in which those topics are discussed. This is an important task even if you don't understand all the material at first. Your reading will prepare you to ask (and answer) questions in class, to understand class examples more fully, and in general to make better use of class time.

You will regularly be asked to complete online quizzes based on the reading material. These short multiple-choice quizzes should be quite easy if you have read the text. Each quiz will be posted on the class day *before* the class it pertains to, if not earlier. You must complete the quiz by the morning of the corresponding class.

Final Grade Adjustment

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 used to adjust your overall grade. Students who have participated significantly more than the class average will earn an adjustment of up to two percentage points. Students who participate at an average level will earn up to one percentage point. Students who participate significantly below the class average will not earn a grade adjustment. This adjustment cannot lower your grade, but may help if you are at a borderline. Because this is an adjustment rather than a formal component of your overall grade, *absences and "clicker" malfunctions will not be excused.*

Aside from this adjustment, *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 academic work or actions in this course, 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 will not hesitate to report my suspicions of dishonesty to the Office of the Vice President for Instruction.

Student Expectations

- 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 to learn, willing 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 are responsible for all topics discussed in class, all class announcements, and all assigned textbook reading (even if some sections are not explicitly covered in class). While attendance is not mandatory, you will be at a serious disadvantage compared to your classmates if you skip class. Absence does not excuse you from your responsibility.
- You are responsible for the material covered in the homework assignments. I cannot emphasize enough the importance of doing the homework! Just as with other areas of learning, your physics problem-solving skills will improve only by practicing conscientiously and consistently. You will seriously diminish the learning value of homework if you leave it for the last minute, or depend on others' efforts.
- Attend your assigned lab section and follow the TAs' instructions. Refer to the lab schedule online for more information on lab policies, including attendance and make-up policies. If you have lab-related questions, please see Mr. Tom Barnello in Room 319.
- 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 rules concerning withdrawals and incompletes, published in the UGA *Undergraduate Bulletin*. Of particular importance is the following passage:

  > 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 absenses as defined in the course syllabus. Withdrawals after the drop/add period will result in course entries on the academic record with grades of W or WF as assigned by the instructor(s). A student who withdraws or is withdrawn for excessive absences after the midpoint withdrawal deadline of the semester (date to be specified in the Schedule of Classes) is assigned a grade of WF, except in those cases in which the student is doing satisfactory work and the withdrawal is recommended by the Office of Student Affairs because of emergency or health reasons.

  For withdrawals before the midpoint, I will generally enter a grade of W even for technically failing grades, *if* I judge that you have made a sincere 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 do not complete the initial required administrative tasks of the course (questionnaire, "clicker" registration, etc.), you may be withdrawn from the class.

PHYS 1111 Class Schedule
Spring 2007

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 midpoint withdrawal deadline is 1 March.

Class	Date	Reading	Topic
1	M 8 Jan	(1.1–1.7)	Course Introduction
2	W 10 Jan	2.1–2.3	1D Kinematics
3	F 12 Jan	2.4–2.5	1D Kinematics
	M 15 Jan		MLK HOLIDAY
4	W 17 Jan	2.6–2.7	1D Kinematics
5	F 19 Jan	3.1–3.3	Vectors
6	M 22 Jan	3.4–3.5	Vectors
7	W 24 Jan	3.6	Relative Motion
8	F 26 Jan	4.1–4.2	2D Kinematics
9	M 29 Jan	4.3–4.4	2D Kinematics
10	W 31 Jan	4.5	2D Kinematics
11	F 2 Feb	5.1–5.3	Newton's Laws and Forces
12	M 5 Feb	5.4–5.5	Newton's Laws and Forces
13	W 7 Feb		**EXAM #1**, Chapters 1–4
14	F 9 Feb	5.6–5.7	Newton's Laws and Forces
15	M 12 Feb	6.1–6.2	Friction, Springs
16	W 14 Feb	6.3–6.4	Equilibrium
17	F 16 Feb	6.5	Circular Motion
18	M 19 Feb	7.1–7.2	Work and Energy
19	W 21 Feb	7.3–7.4	Work and Energy
20	F 23 Feb	8.1–8.2	Conservation of Energy
21	M 26 Feb	8.3–8.4	Conservation of Energy
22	W 28 Feb	8.5	Conservation of Energy
23	F 2 Mar	9.1–9.3	Momentum and Impulse
24	M 5 Mar	9.4–9.5	1D Collisions
25	W 7 Mar	9.6–9.7	2D Collisions
26	F 9 Mar		**EXAM #2**, Chapters 5–8
	M 12 Mar		SPRING BREAK
	W 14 Mar		SPRING BREAK
	F 16 Mar		SPRING BREAK
27	M 19 Mar	10.1–10.2	Center of Mass, Rotational Kinematics
28	W 21 Mar	10.3–10.4	Rotational Kinematics
29	F 23 Mar	10.5–10.6	Rotational Kinematics

Class	Date	Reading	Topic
30	M 26 Mar	11.1–11.2	Rotational Dynamics
31	W 28 Mar	11.3–11.4	Static Equilibrium
32	F 30 Mar	11.5	Rotational Dynamics
33	M 2 Apr	11.6–11.7	Angular Momentum
34	W 4 Apr	11.8	Rotational Work
35	F 6 Apr	12.1–12.3	Gravitation
36	M 9 Apr	12.4–12.5	Gravitation
37	W 11 Apr	13.1–13.2	Simple Harmonic Motion
38	F 13 Apr	13.3–13.4	Simple Harmonic Motion
39	M 16 Apr		**EXAM #3**, Chapters 9–12
40	W 18 Apr	13.5–13.6	Simple Harmonic Motion
41	F 20 Apr	14.1–14.3	Waves and Sound
42	M 23 Apr	14.4, 14.6	Waves and Sound
43	W 25 Apr	14.7–14.8	Superposition and Interference
44	F 27 Apr	14.9	Superposition and Interference
45	M 1 May		Course Review
	M 4 May		**FINAL EXAM**, 7:00–10:00 pm