Physics 53
Course Description

Grading Scheme

Your grade will be based on *approximately* the following scheme:

20% of grade Homework.

20% Quizzes

20-30% Hour Exams (2)

20-30% Final

10% Lab

Optional, 1/3 letter grade Extra Credit Project

Here's how the scheme works. First of all, note that there will be *lots* of homework problems. Homework is an *essential* part of learning physics and must not be neglected. I expect all students to do the assigned problems and to at least skim-read the chapters before we cover them in class.

Physics is one of the most difficult courses undergraduates typically take and you should plan to expend effort in this class accordingly. We will necessarily maintain a fast pace and every new topic builds on the old ones already covered; you must guard against falling behind! If you discover that you are falling behind or that your preparation in algebra, trigonometry, or calculus is inadequate, *seek help immediately.* Sources of help are: Your recitation instructor, your lab TA, the physics help sessions, your peers in the class, the peer tutoring program (peers who have already completed the class), wikipedia and the web, the online supplement/textbook here:

http://www.phy.duke.edu/∼rgb/Class/intro_physics_1.php

Note well that I provide a separate online math review supplement/textbook here:

http://www.phy.duke.edu/∼rgb/Class/math_for_intro_physics.php

In this book more or less *all the math you will need* is *completely covered*, so please, make an effort to skim over it and refer to it as necessary.

Note as well the following special rule: **The final exam in this course will replace any *one* hour exam grade, provided that it is higher!** This allows students to make up for their worst single hour exam performance with their final, so one bad exam day won't hurt your grade. If you miss any exam for any reason without *prior permission and/or for an excused reason* (where the former might be obtained for a special event or sports participation, the latter is automatic for illness or at the request of a Dean) then your final will thus transparently replace the missing exam as your lowest one.

The general rule for grades will be: if you get below a 50 (and the curve is otherwise reasonable) and have not religiously handed in your homework, you fail (F). If you get less than a 60 and have not religiously handed in your homework, you get an D. If you get 60 or more you get a C- or better and "pass". If you have religiously done your homework, but have somehow managed to end up less than a 60 or (worse) 50, this will be taken into account and adjustments *may* be made at the discretion of your recitation instructor. If you have not consistently done and handed in your homework on time, though, very little consideration will be given!

Note that your final grade will be assigned by your recitation instructor, not the lecturer, as the person most familiar with your effort expended in the course. Your instructor has some leeway to adjust any grade up *or* down that in their opinion does not accurately reflect your work done in the course. However, by and large all of the people taking the course will be graded objectively and on a common scale across all sections.

Note also that the class performance *will* be plotted on a histogram and adjustments to the above scheme will be made as suggested by the final distribution of scores. In addition, we reserve the right to make modest changes in the exact percentages assigned to any particular component of the grade, such as increasing the weight of the lab component of the grade and decreasing the homework component.

The Course Rules

Duke is governed by the Duke Community Standard – an honor code to which you have all formally agreed. I remind you of its wording:

Duke Community Standard

> Duke University is a community dedicated to scholarship, leadership, and service and to the principles of honesty, fairness, respect, and accountability. Citizens in this community commit to reflect upon and uphold these principles in all academic and non-academic endeavors, and to protect and promote a culture of integrity.
>
> To uphold the Duke Community Standard:
>
> - I will not lie, cheat or steal in my academic endeavors;
> - I will conduct myself honorably in all my endeavors; and
> - I will *act* if the Standard is compromised.

With this standard *firmly in mind*, here are the rules for academic conduct in this class. If you have any objections to these rules or wish to suggest changes, feel free to raise them in an open discussion with me, but otherwise please follow these rules as you do the homework and take the exams associated with this course.

- You **may** collaborate with your classmates in any permutation on the **homework**. In fact, I *strongly suggest* that you work in (your recitation) groups on your homework *outside* of class whenever possible, as you will all learn more that way. However, you must **each** write up *all* the solutions to the assigned problems even if they are all the same within a group. Writing them up provides learning reinforcement.

- You may **not** get *worked out solutions* from more advanced students, former students of mine, fraternity files, or any sort of solution manual. To learn physics, you need to *struggle* with the problems, with mentoring and collaboration as needed, but without anything that reduces your role to that of a (bad) copy machine. Note that it is not the policy of this course to provide copies of worked out answers to homework or

test problems even *after* the homework or test in question is completed. You are encouraged to (first and foremost) use recitation to *ensure* that your homework is all correct by coming adequately prepared; and to contact your recitation instructor or visit the physics help room to make sure your work is done correctly (or to learn to do it correctly) after the fact.

- You **may** ask more advanced students, former students, other faculty, tutors, personal friends, or your household pets for help or tutoring on particular problems, as long as *no worked–out solutions to the assigned problems are present when you work with them.* They must agree to work *with* you collaboratively to solve the problem, not give you a solution to copy. Again, if you work in groups I *encourage* you to take turns teaching each other how to work through to the solutions to the problems you encounter, as teaching is an excellent way (perhaps the best way) to learn.

- You **may** use the library, physics textbooks (online or otherwise), and all available non–human resources to help solve the homework problems. I don't even care if you find the solution somewhere and **copy it verbatim** provided that you **understand it afterwards** (which is the primary goal) and **cite your source**. I would prefer that you do not routinely look for solutions rather than work them out yourself; save this approach for the toughest problems. Remember, you can't take outside resources into an exam with you; sooner or later you will need to learn to solve the problems on your own. On the other hand, real problem solving often involves a certain amount of library research.

- Your recitation instructor and the other course faculty are your most important learning resources. You can always ask your recitation instructor (or the lecturer) how to solve a homework problem, and if we can see that you've at least *tried* it on your own we'll almost always be happy to give you hints or even walk you through it if you are truly stumped.

- **Quizzes, Hour Exams, Final Exam:** All quiz and exam problems are to be worked out **alone**. Calculators may be used on physics exams but will be provided to the limited extent that they will be useful. Looking at or copying other students' work on exams is obviously not

permitted, and *will be severely penalized if discovered.* I *assume* that all my students are honorable persons and will play the game honestly and according to the Duke Community Standard above – do not damage your own honor and spirit by behaving dishonorably in this class

Students who have e.g. sports events or legitimate scholastic activities that conflict with an hour exam can petition for a makeup *as long as they do so at least 48 hours before the exam.* Makeup exams will be given at only one time (generally *before* the missed exam), at the convenience of the instructor; students that cannot make the makeup will have to take their final exam score (on a 100 point basis) in lieu of the missing hour exam score. Students who seek relief from 3 finals in a 24 hour period are advised to first seek it in another course as physics has a block final and should therefore receive first priority. If this is not possible, the student must contact the course instructor no later than the last day of class and make arrangements to take the final on another day.

- **Illness on the Day of a Quiz or Exam:** Students that are ill on recitation day may be given an opportunity to make up the quiz at the complete discretion of the recitation instructor; otherwise the (properly excused) quiz may be dropped. Students that are ill on the day of an hour exam may have to take their final exam score (on a 100 point basis) in lieu of the missed hour exam score. Students that are ill on the day of the final exam must follow University rules and procedures and immediately contact the instructor to make arrangements for completing the course final as soon as health permits.

Structure and Expectations

The following describes the structure of the class and what you should do to take maximum advantage of it.

- We'll be covering close to a chapter a week – so much so that the online intro physics text presents it "week by week" in perfect alignment with the syllabus and schedule. This leaves very little time to "get" a difficult concept, if you wait until each one is taught in class. Get used to reading and studying the chapter(s) in Knight and online on your own **before** the relevant lectures, and again when you tackle your homework (in each pass!), and again in recitation where we go over the homework, and again when you go over your homework and quizzes when you get them back, and again before the hour exam, and again before the final. You will need to overlap this in order to get enough "views" of or "passes" through the material to make learning relatively easy.

- Lecture is intended to present a general, conceptual, derivational overview of the principles and laws of the physics being covered. It will be rich with examples, but real problem solving methology will primarily be self-taught with close support *before* (ideally in multiple passes through the homework at home) and *during* recitation.

- Recitation will be used to go over the most difficult homework problems in small groups. This is intended to be a time when you teach each other, and learn thereby. Your recitation instructor will move from group to group and provide tutorial support. A short (20 minute) graded quiz will generally terminate recitation.

- There will be 2 hour exams over the course of the semester. This is roughly every six course-weeks, allowing for fall break and Thanksgiving break.

- Lab is an important "hands on" part of the course that permit you to *verify that what we teach you is true* throughout the semester. Remember, science is not a subject that is taught on the basis of *authority* – you should believe what we teach you because *you yourself have tested at least parts of it to see that they are true* and that the rest of it

hangs together *consistently* to describe the many, many things in your everyday experience.

Personal Availability and Methods of Contact

Note well that although I (your lecturer, rgb) am the course director as well as lecturer, I am *not* your primary instructor for the course and will not be directly assigning your grade at the end. Your primary instructor is your recitation instructor, who will get to know you and your work firsthand and who will be assigning your actual grade at the end of the semester. You are therefore urged to establish a positive working relationship with your own recitation instructor and to seek help with the homework or to resolve issues with the grading or course concepts with him or her.

However, I (rgb) am *happy* to meet with students taking this course for absolutely any reason – for help resolving some aspect of lecture that you didn't understand, for help with homework, for help resolving grades or seeking permission to e.g. take an exam late for an good reason, to discuss possible projects. I am also the person you should talk to if for any reason you have "issues" with or complaints about me, your lab instructor, your recitation instructor, or any aspect of the course.

I will generally be available for questions of this sort immediately after lecture (between lectures for people in the first lecture), or in my office by appointment (send me email to set up a meeting).