Physics 16: Spring 2008

General Physics I

Course Information

Instructors:

Lectures:

Professor Kannan Jagannathan
Office: 228 Merrill Science
Phone: 542-2346
e-mail: kjagannathan@amherst.edu
Office Hours: TBA

Labs:

Professor Nicholas Darnton
Office: 118 Merrill Science
e-mail: ndarnton@amherst.edu
Office Hours: Tuesday 2-4 and Friday 10-12

Lab Coordinator and Teaching Fellow:
Dr. Daniel H. Guest

Course Times:
Lectures: MWF 11-11:50;
Labs: Thursday 1 – 4 p.m. or Friday 2 – 5 p.m.

Text: Young and Freedman, *University Physics*, 12th ed. Vol.1.
Available at Amherst Books; the PRS clicker is also available at that store.

Pre-requisite: **Math 11, the first semester of calculus, or its equivalent is a pre-requisite for the course. If you are not sure you meet the requirement, please see the instructor right away.**

Communication: You should consult the College's Blackboard web page (log in at blackboard.amherst.edu) for this course for announcements, assignments, solutions to homework problems and most other course documents. [We may experiment with using the College's CMS site, but we will make the announcement if we do]. You should check the web page regularly for updates and course-related postings. In addition, you are responsible for noting and following up on any announcements made during the lectures and the scheduled laboratory sessions. Announcement in any one of these venues will be considered sufficient notification.

Attendance: Regular attendance at lectures is expected. Persistent absence without adequate explanation will result in a lower grade than is indicated by just the other factors that count for the grade. Successful and timely completion of **all** the laboratory exercises and write-ups is required for a passing grade. The only exceptions will be for grave medical or personal crises, and in those cases, documentation from the Dean of Students office supporting your cause is required.

Course Requirements & Grading: Your work in the course consists of the assigned readings, class participation including the PRS quizzes, the weekly homework assignments, the lab performance and reports (both formal and informal, see below), three mid-term exams and a final exam. Evaluation of your work in the course will be based on all of these pieces.

Grading breakdown: Your final grade for the course will depend on work roughly as shown below. In addition, your grade will be adjusted by subjective considerations such as class participation, active participation in lab, and overall improvement in the course. Note again, however, that satisfactory completion of **all** labs, lab exit interviews, and lab reports is a necessary condition for obtaining a passing grade.

Midterm exams (total): 30%
Final exam: 30%
Lab: 20%
Homework: 10%
Pre- class and/or In- class quizzes: 5%
Participation, attendance, improvement etc.: 5%

Homework: Readings from the text and homework problems will be assigned weekly. The readings will help prepare you for the material to be covered in the lectures, and you should read them in advance of the corresponding lectures. The problems constitute a relatively small portion of the grade, but that belies their importance. They are absolutely necessary in attaining the sort of functional understanding of physics that is the goal in this course. If you slack off in doing the homework, you will undoubtedly suffer when it comes to the exams. You should try to work the problems thoroughly and seek help only after you've banged your head on them a bit. Working problems with your fellow classmates will help you avoid pitfalls and mitigate frustration. Rules for collaboration and citation of sources on homework are detailed in the Statement of Intellectual Responsibility below.

Roughly 10 problems will be assigned each week on Wednesday and are due on the following Tuesday by 5 p.m. Late written homework presents severe organizational problems (solutions are posted on the Blackboard page and the graders need to get the pile in a timely manner). As a consequence, the following **strict** rule applies: Late written homework will be accepted until 10 a.m. on Wednesday, but will only receive half credit. Anything turned in after 10 a.m. on Wednesday will not receive credit, although it will be "graded" to give you some feedback. Problems will be graded by student graders and will be perused by the instructor before being returned to you.

Exams: There will be three mid-term exams during the semester and a final during exam period. Midterm exams will focus on material presented since the last exam, but in this sort of a course they are necessarily cumulative. The mid-term exam schedule is given in the attached syllabus. If any of the exam times presents a serious conflict, you **must** inform the instructor **in advance,** no later than a week before the exam. In general, extracurricular activities do not constitute a serious conflict.

Labs: Labs will meet weekly in Merrill 200. The schedule of experiments is included in the attached syllabus. The Physics 16 Lab Manual, will be distributed during the first week of the course. Before coming to the first lab session you should read the *General Instructions* section and the *Comments for Formal Laboratory Reports* section of the Physics 16 lab manual. Before coming to lab each week you should carefully read through the experiment in the lab manual. It is true that parts of the description will be clearer when you actually come to the lab and view the set up, but prior reading will make your lab work go more smoothly. The lab instructors will generally make some introductory comments about the experimental apparatus at the beginning of the lab, but they will assume that you have read the lab itself and have a general idea what the physics goal is and what measurements you'll have to take.

Some labs are *informal*. The experiment and the analysis are to be completed in lab, and a clear account of the results is to be written up in the lab notebook. At the end of the lab, an "exit interview" will be conducted by either your instructor or the Lab Coordinator. When they determine that you have satisfactorily completed the laboratory, they will initial your notebook and check you off as having finished the laboratory. A few experiments will require a *formal written lab report*. Formal reports are due a week from the end of the lab period. They will be graded by the Lab Coordinator and returned. Your final grade will depend on these reports, on the exit interviews, and on the quality of the record keeping in your notebook (which will be evaluated when you turn in your notebooks at the end of the semester). Except when preparing a formal write-up, lab notebooks will remain in the lab room. This policy discourages your spending valuable study time prettying up the weekly lab results, but will require you to work swiftly and efficient during the limited lab hours.
At the first lab meeting, we will supply the required lab notebook in which you record your data. Your student account will be charged for the notebook.

Late lab-report policy: If you turn in a formal lab report late, you will receive a 10% grade penalty for the first 24 hours it is late and another 20% for every additional 24 hours.

Pre-Class and In-Class quizzes: Before most lectures there will be a short pre-class quiz on Blackboard to encourage you to do the reading in advance. The quizzes will be fairly simple if you've done the reading. They're to be completed by 10:45 am on each class

day. You'll receive 5 points for a correct answer, 2 point for an incorrect answer, 0 points for not attempting. Each of you will also have to buy a clicker (remote control) that you will use regularly during lectures to respond to conceptual questions. The students' responses will be tabulated (anonymously) by the computer and displayed as a histogram which will then prompt a discussion among the students. In the first attempt, if there is a significant divergence of opinion among the students or if there is convergence towards a wrong answer, we will give you a chance to try again after discussion. The computer will keep track of who has responded and who hasn't. You get credit for responding independent of whether you gave the right or wrong answer, but you get no credit if you do not respond. All these quiz grades will be compounded for a total of roughly 5% towards the final grade.

Additional help:

Of course, you are encouraged to utilize the instructors' office hours. In addition, evening problem/review sessions will be run by an instructor or by an undergraduate TA. Problem session on Monday evenings: We will hold a weekly problem session the night before homework is due. This is designed to provide a convenient location for students to collaborate on the last and/or most difficult questions on the problem set. Prof. Darnton and/or TAs will be available to answer questions as a last resort for the most intractable questions.

You are encouraged to take advantage of the Quantitative Skill Center for instruction in problem solving. The QSC is conveniently located at 202 Merrill. See their web page http://www.amherst.edu/~qcenter for more details.

The Peer Tutoring program is run by the Office of the Dean of Students. If you need a few hours a week of tutoring they can provide you with a tutor, often a physics major. Contact the instructor or the Office of the Dean of Students for details.

There is an online introductory mechanics course that you may find helpful, at http://www.mcasco.com/p1outln.html. The publisher of the course textbook has an associated website, http://www.awlonline.com/young, that has additional problems, quizzes, discussion, etc.

Statement of Intellectual Responsibility:

Homework - Co-operation on the weekly homework assignments is encouraged. However, co-operation **does not** mean that some people do the problems and others copy them down. After you talk with your partners, you should complete the problems on your own putting down as your work only what you understand and can defend. If you consult other people or books it is important that you make a brief written acknowledgement by citing the source of help. The only exception for this general rule is that you need not cite your instructors in this course or the course textbook.

We urge great caution in using the web while you work on the homework. You are strictly forbidden from consulting solution manuals or sites that purport to build your conceptual base, but are in reality places that sell (or give away) homework solutions. Use of such sites defeats the purpose of the course and we will consider such use a serious breach of intellectual responsibility that could result in disciplinary action. On the other hand, you

may look up general physical and astronomical data or integrals or general mathematical formulas and identities on the web. When in doubt, either check with the instructors (not the graders), or err on the side of caution and refrain from using the web sources.

Tests and Exams - The rules for the mid-term and final exams are markedly different from the ones for the homework assignments. On these occasions, you are almost completely on your own. You will be allowed only a calculator and writing instruments during the exams. No consultation with friends, books, or sources other than those explicitly authorized is allowed. A violation of these rules is a very serious matter, and may result in formal charges through the College's disciplinary process.

Pre-class quizzes - Pre-class quizzes are a form of open-book test. You may not consult with other people (except the professors) when working the pre-class quizzes. You may use your textbook, however.

Laboratory Work - In addition to the general rules of intellectual responsibility, scientific integrity requires that you treat experimental data that you collect as inviolate. You should not erase or render illegible the primary data you enter in your lab notebook. You should not modify such data either whimsically or for some desired result. If you think you made a mistake in an entry, place a single line through that entry, and enter the correct item below. If you decide to disregard some body of data in your analysis, say so in your lab notebook and offer a reason for your decision, but do not tear out or otherwise eradicate the offending data. Under no circumstances should you "cook the books" and offer virtual or imagined numbers and propositions as actual observations. For more detail on the lab notebook and reports, please see the general instructions on labs in your lab manual.