

University of California, Santa Barbara
Department of Physics
Physics 21 - Winter 2005

Prof. Harry N. Nelson

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Lecture: Monday, Wednesday, Friday 8:00-8:50am Broida 1640

Discussion: Friday 11:00-11:50am Phelps 1508

Math/Mathematica Help: Tuesday and/or Thursday, 2:00-2:50pm, Miramar-Phelps 1526 (Instructional Computing).

Office Hours: Nelson: Thursday 3:30-5:00PM, Friday 1-2PM and by appointment, Broida 5103

On the World Wide Web, the course URL will be <http://physics.ucsb.edu/~phys21/w2005/>. A discussion group for the course is available at <http://groups-beta.google.com/group/ucsbp21w05>.

Required Textbook: D. Kleppner and R.J. Kolenkow, **An Introduction to Mechanics**

Supplemental Texts: D. Kleppner and N. Ramsey, **Quick Calculus, Second Edition**. Recommended for those who want to turbocharge their calculus. Norman Ramsey is a Physics Nobel Laureate; D. Halliday and R. Resnick. **Physics: Classic Edition**. This is the Physics 1 text; we will take many homework problems out of it.

Content: Physics 21 is the first quarter of physics intended for physics majors and those who have a strong interest in physics. The topic is mechanics, which is the description of the motion of bodies under forces. We will use calculus, but we will not assume that the students have a mastery of calculus; we will try to teach and emphasize how to employ calculus.

Grading, etc.: Midterm dates are **Friday, January 28** and **Friday, February 18**; each is 20% of the course grade. The final, which is 40% of the course grade, will be **Friday, March 18** from **8-11AM in 1640 Broida**. Credit for missed exams will be zero points. Missing both midterms, or, missing the scheduled final will result in an automatic course grade of F. The assigned problems will count for 20% of the grade.

Course Pace and Problems: Roughly, there are 9 pages of reading for each lecture; we assume you have done the reading in advance of the lecture. A detailed syllabus is on the last page of this document. The plan is to assign 3-4 homework problems that correspond to each lecture. It is a fast pace, and if you fall behind it will be hard to catch up. It will help if you try to do the relevant problems when you do the reading, and try to finish them just after the lecture. Problem sets will be assigned each Monday, and due the following Monday in lecture. Problem sets turned in up to one week after due will receive 50% credit; those turned in later will be noted, but will not receive credit.

Discussion Sections: The mandatory discussion section is Friday 11-11:50am in Phelps 1508 and will be led by Feraz Azhar. We are also scheduled into Instructional Computing, Miramar-Phelps 1526, Tu/Th 2:00-2:50, for a Math/Mathematica booster section. This is not mandatory, and is intended to help those who feel their calculus background needs strengthening. The plan is to meet only 1 of the two days.

Help: Attend your discussion section, and make good use of office hours. Working problems is of crucial importance: definitely work examples and unassigned problems; also work the assigned problems carefully and thoughtfully. For assigned problems, it is OK to collaborate with other students in the solving of the problems, but you must write up your own independent solutions. Many solutions to assigned problems are now available on the web, and you can find them with Google. This development has made the credit for problems lower than it once was. It is in your interest, nonetheless, to solve problems yourself: you will not be able to work the exam problems if you have not worked the homework problems yourself, without the help of an answer key. The **Physics Study Center** at 3314 Broida Hall, also called the **PLC**, has physics teaching assistants available during working hours. You can attend free Instructional Groups if you make advance arrangements with the Campus Learning Assistant Service (CLAS) in Bldg. 477, phone 893-3269.

Perspective: Physics 21 is a challenging course, but with calm, diligent effort, you will succeed. To succeed efficiently:

1. Do the reading *before* attending lecture.
 2. Read with pencil, paper, and calculator or spreadsheet at hand, and stop to work simple problems, draw pictures, and make calculations while reading.
 3. Try some of the assigned problems before the relevant lecture.
 4. Complete those problems just after lecture, and then seek help if you cannot get some problems.
 5. Remember: mastering physics means mastering problem-solving, and memorization helps only to the extent it makes problem-solving easier.
 6. Break down problem solving into small steps, including:
 - (a) setting up the problem, which usually includes drawing a picture, labeling it, converting numbers to useful units, and deciding upon the relevant physical principles.
 - (b) deciding upon what is unknown, and how to solve for the unknowns.
 - (c) reviewing the solution: is it reasonable? ; does it answer the question?
 7. **Attend your discussion section, and make use of office hours.**
 8. Prior to a test, review the assigned problems, and practice setting up lots of problems.
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