PHYSICS 151 - MECHANICS AND THERMODYNAMICS
SUMMER 2002

WELCOME TO PHYSICS 151! This is the first course in the physics sequence intended for physical science and engineering majors. The subject material is classical mechanics and thermodynamics. The goal of the course is to teach you how to approach and solve physical problems and how to develop an intuition for the important physical properties which affect a given situation.

The sequence of courses 151-153 is to be considered as a whole. In the succeeding courses you will be expected to make use of material covered in this course.

I. COURSE INSTRUCTOR

Prof. Cole
Lecture: MTuWTh 1-3 SLH 100
Office: SHS 361
Office hours: Th 11-12
Phone: 821-1228
Lab: MW 9-12 KAP B8
Quiz: Tu 10-12 TBA

II. COURSE MATERIALS

II.A. Required for the lecture

Paul A. Tipler, *Physics for Scientists and Engineers*, Extended Version, Fourth Edition (W.H. Freeman, 1999). Available in the USC Bookstore. NOTE: This book will also be used in Physics 152 and 153. Don't sell your book at the end of the semester if you are continuing the course sequence.

II.B. Required for the Laboratory

Laboratory Manual for Physics 151L, Spring 2002 Edition (USC Department of Physics and Astronomy, 2002). $8.00. This manual is sold only in SGM 407, the Physics Undergraduate Office, between the hours of 8:30AM and 5PM, Monday through Friday. *The manual is not sold in the bookstore.* All sales are by check only - no credit cards, cash, or discretionary. All sales are final.

Science Notebook (National Notebook 43-645). Any equivalent notebook with quadrille ruled pre-numbered pages bound into the notebook and with identically numbered pages for copies (either carbon copies or carbonless forms) is acceptable.

II.C. Optional supplementary materials

G. Mosca, G.C. Kyker, Jr., and R. Gautreau, *Study Guide*, vol. 1, to accompany Tipler, *Physics*, Fourth Edition, Chs. 1-21 (W.H. Freeman, 1999). Available in the USC Bookstore.

III. ADMINISTRIVIA

III.A. Prerequisites

The prerequisite for this course is MATH 125 (Calculus I). MATH 126 (Calculus II), though not an explicit corequisite, should be considered effectively one, as it is a prerequisite for PHYS 152L.

III.B. Registration

Your registration for this course consists of two separate parts: a lecture and a laboratory. You must be registered for both. (The only exception is if you have previously completed the laboratory *and* have received permission to carry its grade into the current semester. In that case, you would register only for the lecture.). The laboratory meets twice a week for three hours each.

III.C. Disabilities

Students who need to request accommodations based on a disability are required to register each semester with the Office of Disability Services and Programs (DSP). In addition, a letter of verification to the instructor from DSP is needed for the semester you are enrolled in this course. If you have any questions concerning this procedure, please call the instructor and DSP at STU 301, 740-0776.

IV. GRADING

Your course grade will be based on the following distribution:

80% Lecture
20% Homework
10% Quiz exams
25% Midterm
25% Final Examination
20% Laboratory

In order to receive a passing grade in the course (D-above) you must receive a passing grade in BOTH the lecture and the laboratory portions. In addition, you must receive a passing grade on the final examination. Each semester a few students fail to complete the laboratory experiments and consequently fail the entire course - please don't let this happen!

IV.A. Homework

Homework is due each week. Homework must be turned in *at the beginning* of the lecture, not at the end, on the day they are due. Please turn in your homework on time, because *late homework will not be accepted.* Please make sure to *staple together* multiple sheets, since all work submitted

as loose pages will not be graded. Your lowest homework scores will be dropped from the calculation of your cumulative homework grade at the end of the semester.

We expect that it will take most students around four to five hours to complete each homework set. The sets are the central way to master the course material. “Understanding” physics does not mean knowing the words and reading the book. “Understanding” implies development of the necessary skills to solve physics problems you have not seen before.

Homework problems will range from the trivial to the difficult. Midterm and final examination questions will most closely resemble (and in isolated instances may be identical to) homework problems on the difficult end of the spectrum. Experience shows a strong positive correlation between total homework scores and total exam scores. For these reasons we urge you to attempt every homework problem, even if you are not able to complete each one.

We encourage you to work with friends on deciding how to do the homework. This does not imply simply copying solutions from each other. You can learn a tremendous amount by cooperating and explaining to each other how to analyze a problem, but everyone must turn in individual problems.

IV.B. Examinations

There will be one Midterm examination and one Final examination. Both will be two hour examinations.

IV.C. Laboratory

PHYS 151L laboratories *will meet* during the first week of classes. You must bring your Laboratory Manual and Notebook to every laboratory meeting, *including the first.*

Your laboratory grade will be derived from your experimental results, lab notebook plus analysis, laboratory quizzes, lab midterm, lab practical, lab final and your demonstrated ability to perform experiments. As noted previously, it is necessary to pass the laboratory portion of the course in order to pass the course as a whole.

If you miss a laboratory period, it is your *responsibility* to make arrangements with your TA to make up the missing experiment. Your TA will not make this arrangement for you. *Do not simply attend a different laboratory section unannounced.* TA’s will not accept students in the laboratory who are not registered in their section without prior official arrangements.

Questions concerning the laboratory should be referred to the Laboratory Director, Kristin Sabo, KAP B19, 740-1138.

V. ASSISTANCE

You have a variety of opportunities for assistance available to you. We list some of these below.

V.A. Laboratory TA's

All laboratory teaching assistants are graduate students, usually pursuing a Ph.D. in Physics. They are all capable of answering any questions you have regarding subject material. Usually your lab TA can answer questions immediately, either at the beginning or at the end of the lab period. However, some problems you pose may require some additional thought. In either event, you should regard your TA as a resource not only for the laboratory, but also for lecture-related questions. Your lab TA will also have office hours for assistance.

V.B. Published Solutions

Images of homework sets that have been completed, as well as images of midterms and final examinations from previous semesters, are available on the Web as described below in Section VI.A. With few exceptions additional paper copies of these solutions will not be made available. You may, of course, print out any solutions for our Web site which you find useful.

V.C. Optional materials and other books

The *Study Guide* listed in Section II.C. may be useful, thought it will not be referenced specifically in lectures. Several other calculus-based texts will be placed on reserve at the main desk in Leavey Library.

Halliday, Resnick and Walker, *Fundamentals of Physics*, vol. 1, Sixth Edition (Wiley, 2001)
Resnick, Halliday and Krane, *Physics*, vol. 1, Fourth Edition (Wiley, 1992)
Serway, *Physics for Scientists and Engineers*, Third Edition (Saunders, 1990)
Young, *University Physics*, Eighth Edition (Addison-Wesley, 1992)

V.D. Textbook Web site

The publisher provides a Web site to supplement the material in the text at http://www.whfreeman.com/tipler/.

VI. ELECTRONIC ASSISTANCE

VI.A. World Wide Web

Graphical browsers such as Explorer or Netscape have become a common way for organizations to provide useful information and services. The PHYS 151 home page is at

http://physics.usc.edu/Classes/151

but can reached from the USC home page by following obvious links through the Department of Physics and Astronomy. Under this home page you will find the lecture syllabus and schedule; the laboratory schedule; images of solutions for completed homework; and copies of examinations from previous semesters.

VII. IMPORTANT DATES

Last day to drop without a “W” - Thursday, May 23
Midterm Exam - Thursday, June 6
Last day to drop with a “W” - Wednesday, June 19
Last day classes and Final Exam - Tuesday, June 25

HOMEWORK ASSIGNMENTS

Homework assignments are due each week. Use the following format for your homework.

1. Write on only one side of 8 1/2 x 11 paper.

2. Number each problem with chapter and exercise number such as 6-12. (Work problems in the order they are assigned.)

3. Staple or securely fasten all your papers together.

4. Fold papers once lengthwise to obtain 4 1/4 x 11 size.

5. Print your name and social security number on the outside as indicated before.

   Last name, First, Initial

   Social Security Number

   Assignment number, Date

   Sign your name

6. Do all calculations to 3 significant figures. This is very important.

7. Be sure to show all your work clearly. Write formulas first; then show the numbers; finally give the answer.

8. Neatness is very important.

9. In a problem where a graph of plot is required, use **graph paper** or a reasonable substitute.

PHYSICS 151 HOMEWORK ASSIGNMENTS

Week	Homework assignment	Date due
1	Chapter 1: 1, 2, 20, 52, 62 Chapter 2: 12, 29, 44, 54, 57, 59, 73, 81	Monday, May 20