PHYSICS 2414
Physics for Life Science Majors
Fall 2004

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Office Hours: Mon, Wed 2:00-3:30 p.m. or by appointment.

CLASS HOURS: M,W,F 12:30-1:20 p.m., Neilsen Hall, Room A204

DISCUSSION: Section 011 - Tuesday, 8:30- 9:20 a.m., Nielsen Hall 209 Bottoms
Section 012 - Tuesday, 9:30-10:20 a.m., Nielsen Hall 209 Bottoms
Section 013 - Tuesday, 11:30-12:20 p.m., Sarkeys Energy Center N0202 Brucker
Section 014 - Tuesday, 12:30- 1:20 p.m., Sarkeys Energy Center N0202 Brucker
Section 015 - Tuesday, 10:30- 11:20 a.m., Kaufman Hall 234 Brucker
Section 016 - Tuesday, 8:30- 9:20 a.m., Gittinger Hall 344 Fleshman
Section 017 - Tuesday, 9:30- 10:20 a.m., Armory 105 Fleshman
Section 018 - Tuesday, 10:30- 11:20 a.m., Jacobson Faculty Hall 102 Bottoms
Section 019 - Thursday, 8:30- 9:20 a.m., Neilsen Hall A204 Fleshman

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Office Hours: Mon 10:00-11:30 a.m., Wed 10:00-11:30 a.m.

TEXTBOOK: *College Physics* by Giambattista,Richardson,Richardson (McGraw Hill)

CLASS WEB PAGE: http://www.nhn.ou.edu/~abbott/Phys_2414

1. Course Description, Objectives, and Prerequisites

1.1 DESCRIPTION

Physics 2414 is the first semester of a two semester introductory physics course aimed primarily at the health science professions and life science majors. The course focuses on the area of physics known as mechanics, but also covers fluids and oscillatory motion.

1.2 OBJECTIVES

1.2.1 Understand the Basic Physics Principles Covered During the Semester

The goal of physics is to understand the physical universe. An understanding of the subjects covered in the class will help prepare those of you who must take pre-professional exams covering physics. Beyond that, an understanding of physical principles may help you perceive the world around you in a more comprehensible, enjoyable, and fascinating way.

1.2.2 Think Critically, Logically, and Analytically When Solving Problems

In order to solve a problem, you must critically examine the information available in a given situation, determine an effective method to approach the problem, and carry through to the solution, including a critical examination of the final answer to see if it is reasonable. These skills are not only essential to solving problems in physics, but to solving problems in general, and are applicable to many situations in many different environments. We will use various methods and techniques to help develop these skills.

1.3 PREREQUISITES

Math 1523 is a required prerequisite. This course requires the use of algebra and trigonometry. You should be familiar with solving simultaneous equations, polynomial functions, logarithmic and exponential functions, and introductory analytical geometry (e.g. vectors). A short discussion of some of these topics appears in the appendices to the text. In addition, in your first discussion section you will be given a math quiz that will help determine if you have acquired the necessary math skills required for this course. If you are not experienced and proficient with these math skills I highly recommend you do not attempt this course until you have mastered them.

2. A Word About Physics

This is a physics class and, therefore, it has similarities to all other physics classes. Physics is a mathematical science and will require using mathematics as a tool for solving problems. For some students, the math serves as an obstacle to learning physics. I highly recommend that you become very comfortable with the mathematics described in the appendices in the text and on the initial math quiz *before* progressing any farther into the semester.

Some students believe that if they can follow the lectures in class, then they have learned physics. This is not true. To learn physics, a student must do a significant amount of work outside of class thinking about, and interacting with, the course material. *No one ever learns physics by simply reading about it or listening to someone talk about it. You learn it by making the effort to understand the material and by solving problems using the principles learned.* The standard requirement in a college class is that you spend two hours outside class working on the material for every hour in class. Since this is a four hour class, **you should plan on spending about eight hours per week outside of class** interacting with the material and solving problems. Few students will be able to succeed in this class without investing that amount of time.

Finally, physics is an objective science. Problems assigned in physics will usually have objective answers. Consequently, grading standards tend to remain high in physics and other science classes.

3. Course Philosophy

I want you to enjoy Physics 2414. The material we will be covering is fascinating and applicable. It's implications can be observed in almost everything you interact with every day. In order to make this class as interesting and useful as possible, I will need to get feedback from you. Please feel free to ask questions in class and to come by my office during office hours.

As stated in Section 2, you can only learn physics by personally interacting with the material and solving problems. Consequently, I emphasize three methods of learning in this class:

1. Reading and thinking about the assigned material **before** it is discussed in class.
2. Solving problems using the physics concepts and principles, including specific problem solving techniques.
3. Discussing the material and solving problems in class, including working with your classmates.

Thinking about problems and solving them on a regular basis will allow you to learn and appreciate the subject matter in a natural way, without having to cram everything at the last moment. Remember that this is a four hour class so you should spend about eight hours per week outside of class interacting with the material.

4. Course Structure and Assignments

The course will tentatively cover the first **12 chapters** of the text. A calendar listing the tentative due

dates for course assignments is attached as the last page of this syllabus. The calendar may be revised at the discretion of the professor. The 12 chapters are outlined below.

Chapter	Subject
1	Introduction
2	Forces and Introduction to Vectors
3	Forces and Motion Along a Line
4	Forces and Motion in Two Dimensions
5	Circular Motion
6	Energy
7	Linear Momentum
8	Torque and Angular Momentum
9	Fluids
10	Elasticity and Oscillations
11	Waves
12	Sound

Your final grade will be based on the assignments described in the remaining part of Section 4:

4.1 READING QUESTIONS AND CLASS LECTURES

It is important that you read the material that will be covered in class **before** we discuss it in class. Therefore, you will be asked to read every chapter before we discuss it in class and answer **Reading Questions** about the chapter. These Reading Questions will consist of a few questions at the beginning of each lecture. You will need to purchase a "clicker" at the bookstore to answer the in class questions. You will also need to register your "clicker" at Register . In addition there will be interactive questions given during the lecture. Class lectures will be used to clarify and elaborate on concepts which were difficult to understand during your own study. *Class lectures will not necessarily cover all material that you are responsible for learning, but will primarily cover the material that you did not understand during your own reading and study*.

4.2 GROUP PROBLEMS

During your discussion section, you will work on problems with other students who have been assigned to a group with you. Groups will be rearranged a few times during the semester. The groups will allow you to work together with your peers to understand the material. Group activities will primarily consist of working on problems. All activities in the group are cooperative, not competitive, with everyone in the group receiving the same grade on the group assignment. A good group member is not necessarily one who knows the answers. A good group member is one who comes prepared and regularly participates in the group discussion, who enters into the spirit of trying to help his or her fellow group members answer questions, work problems, and better understand the material.

4.3 HOMEWORK

Homework will be assigned on a weekly basis. The homework will consist of about 20-25 problems assigned mostly from the text. The homework will be done online at Webassign . You will need to purchase a card at the bookstore to access this site or you can purchase an access code online. Webassign helpful hints (Word format) . **Homework will be due by 5:00 p.m. on the date specified.** Here are some suggestions for how to get the most out of the homework:

1. *Read the problems as soon as you get them.* You don't have to spend any time working on them; just think about them as you read and study the material.
2. *Don't procrastinate.* You will have a week to work on the problems. Don't wait until the last minute to do them. Many students find that it is very helpful to attempt the problems even before the material is discussed in the class lecture.
3. *Ask Questions.* If you are having problems with the homework, seek help. You may discuss the problems with your classmates, with me during office hours, or with the discussion section instructor.

Although you may discuss the homework with your classmates, all submitted work must be your own. I encourage you to talk with others in order for you to get a general understanding of the problem. Doing the homework is the one of the best ways to prepare for the exams.

4.4 EXAMS

There will be three midterm exams and a final. The midterm exams will be held during the regular class time and will cover material from ~3 chapters. The final will be comprehensive, covering material from the entire semester. The best preparation for these exams is a thorough understanding of the material including an understanding of the problems done for homework and during discussion section. Problem solving techniques used during the discussion section will also be used on the exams.

5. Grading

Your grades will be based on all of the assignments discussed in section 4. **There will be no scheduled make-up exams.** However, an excused absence for medical reasons will be accepted. I will need a signed notice from your doctor along with his or her telephone number. If at all possible, please inform me before any exam of any medical difficulties. Your final grade will be based approximately on the points shown below. This chart may be modified at the discretion of the professor. Any modifications will be announced to the class.

Assignment	Percentage
Reading/In Class Questions	10%
Group Problems	10%
Homework	20%
Midterm Exams	40%
Final Exam	20%

The following criteria will be used for determining letter grades:

A: Superior Work. Student demonstrates an excellent and thorough understanding of the subject.
B: Excellent Work. Student demonstrates an above average understanding of the subject.
C: Good Work. Student demonstrates an average understanding of the subject.
D: Fair Work. Student demonstrates below average understanding of the subject and has completed all assignments.
F: Unsatisfactory Work. Student does not demonstrate an adequate understanding of the subject or has not turned in all assignments

The actual letter grade will be determined as the semester progresses. In past years, grade distributions were **approximately: A** (>87%), **B** (75-87%), **C** (63-75%), **D** (51-63%), **F** (0-51%). The grade distributions will probably be approximately the same this semester, with an average GPA of about 2.5. If you have any questions about the grade on a particular assignment, you should discuss your questions with the professor *within one week after the graded assignment has been returned*. I will not discuss any assignments after this one week period.

All scores will be available on webct

6. Policies

6.1 CALCULATORS

You will need to use a calculator for exams. Using a preprogrammed calculator in an exam to store information not available to the entire class, including solutions or equations, is considered cheating.

6.2 CHEATING

The University policy on cheating will be followed. See the student handbook under academic misconduct for a description of infractions and policies.

6.3 STUDENTS WITH DISABILITIES

Any student in this course who has a disability that may prevent him or her from fully demonstrating his or her abilities should contact me personally as soon as possible so that we can discuss accommodations necessary to ensure full participation in this class and facilitate educational opportunities.

CALENDAR OF IMPORTANT DATES

(This calendar may be revised so please consult assignment sheets or the web page on a regular basis.)

Final Exam is Scheduled for Tuesday, December 14, 1:30 p.m - 3:30 p.m.

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