

# Syllabus

## General Physics – Life Sciences I PHYS 2110 Fall 2016

**Instructor:** Dr. James T. Wheeler

**Office:** SER 228

**Email:** [jim.wheeler@usu.edu](mailto:jim.wheeler@usu.edu)

Email is the quickest way to contact me, and is an excellent way to get questions answered. Most questions can be answered more quickly by email.

**Office Hours:** Tu, W 2:30 - 3.30. Any changes in these times will be in Announcements. Other times available by appointment.

**Prerequisites:** Math 1100 or 1210

### Required Texts:

(1) *Physics*, Cutnell and Johnson, eighth, ninth or tenth edition. An electronic copy of the tenth edition is available through WebAssign at <http://www.webassign.net/>

(2) *Laboratory Manual*, available at the campus bookstore

(3) *WebAssign online homework*, see below for details

**Credits:** 4 credit hours

**Lecture:** MWF, Biology/Natural Resources (BNR) 102, 12:30 – 1:20 PM

**Course Website:** <http://canvas.usu.edu/>

**Final Exam:** Wednesday, December 14, 2016, 11:30 a.m. – 1:20 p.m.

## Outcomes

After successfully completing this class, students will be able to:

- Describe and predict the motions of physical bodies, using the following:
  1. Positions, velocities, accelerations, angular velocity, angular acceleration
  2. Forces and torques, and the use of Newton's laws of motion
  3. Energy, momentum, angular momentum and their conservation laws
- Understand the relationships of fluid pressure, density and velocity

- Describe thermodynamic properties, including internal energy, temperature, heat flow and entropy

Students are expected to remember certain fundamental concepts, and to apply them in solving problems

## Enrollment

You must be enrolled in all three components of the course: *lecture, recitation, and laboratory*.

1. **Lectures** are MWF, Biology/Natural Resources (BNR) 102, 12:30 – 1:20 PM
2. **Recitations** meet on Tuesdays. You may sign up for any one of the five sections.
3. Eight 2-hour **laboratories** are scheduled throughout the semester. **A missed lab can be made up only during the week that it is scheduled**, during another scheduled lab period that has an open slot. To make up a lab, you must obtain a note from the Physics Department office (SER 250). This note will get you into another lab section that week only. No labs are taught on Fridays. Laboratories begin the first week. Numerous laboratory sections are *available*.

## Course structure and assessment

The course has the following components. Percentage values in parentheses (100%) tell how much each counts toward your final grade.

Understanding and applying central concepts is your main goal. It is best achieved by viewing the PowerPoint presentations linked through the Home page, reading the relevant sections of the textbook in advance of the lecture, working out any omitted steps in the slides or text, taking notes through the lecture, and using the homework assignments wisely to expand the depth of your comprehension.

### Preparation for Lectures:

- **View** the Lecture PowerPoints posted online
- **Read** the assignments in the text (Cutnell and Johnson)

### Lectures:

- The lecture will **summarize** the development of important concepts.
- We will present many **demonstrations** that illustrate physical phenomena.
- I will work out example **problems**.
- I always welcome questions in class, and try to make the **answers to your questions** as general as possible.

## Labs:

**All** of the concepts and formulas presented through this course have been developed and tested by tens, hundreds, or even thousands of years' worth of experiments. It is the experiments that comprise the body of our knowledge; the formulas summarize those findings and are modified if they are not found to agree with real-world results. It is therefore important that you gain some feeling for laboratory work in physics.

- There are eight 2-hour **Laboratory Experiments** scheduled through the semester to give you hands-on experience with the material. ***A missed lab can be made up only during the week that it is scheduled***, during another scheduled lab period that has an open slot. To make up a lab, you must obtain a note from the Physics Department office (SER 250). This note will get you into another lab section that week **only**. No labs are taught on Fridays. Laboratories begin the first week.
- Study the experiment **before** coming to lab. The lab TA will provide a brief overview.
- **Laboratory Quizzes** (15%) require you to participate actively in the laboratory and provide a record of this participation. After completing each laboratory, you will be given a quiz consisting of three multiple-choice questions. Each quiz is worth 5 points: 2 points for carrying out the lab and 1 point for each correct answer on the quiz. Your final quiz score will be the number of quiz points divided by 40 (8 quizzes x 5 points / quiz).

## Recitations:

Recitations are meetings of smaller groups of students (currently between 20 and 57 students) with one of the Teaching Assistants (TAs). These sections are an excellent opportunity to work on problems in a helpful environment, in order to deepen your understanding of the material. Recitations will begin during the second week of the semester.

During the last 15 minutes of each recitation, or other time determined by the group and the TA, a sample test problem will be assigned. During this exercise, **you are encouraged to ask your TA for any help at all**. The goal is for you to **complete the problem correctly**. Each time you ask a question, the TA will give you just the information you need to continue further with the problem, until you can complete it. Though you should always complete the problem correctly, your scores on

these **Recitation Quizzes** will count as 10% of your course grade and will help with similar problems on the exams.

This form of quiz is experimental, and may be modified as the semester progresses.

## Homework:

The homework problems provide important practice for realistic applications of the basic concepts. Since these are multiple choice and are automatically graded instantly, it is easy to look up an equation, plug in numbers, see if it's right and, if so, forget about it forever. **Don't do this!** Always try to work to the equations you need from a few basic concepts, and try to **be certain of your answer before you look at the multiple choice possibilities**. Part of each **exam** will be a hand written solution to homework style problems, so you need to learn to recognize within yourself whether you actually "get it". The homework problems can give you this practice if you **use** them.

On WebAssign, each question is worth 1 point toward your total homework score. Your total homework score is the number of correct answers divided by the total number of questions. While the direct solutions are worth 10% of your grade, approximately 25% more will depend on your ability to do problems of this type on the tests.

- **Problems** (10%) will be assigned each week. Unless otherwise noted, these will be due a few minutes before midnight on Tuesday evenings.
- There will be approximately 20 - 25 online, multiple choice questions delivered and graded online through **Cengage** and **WebAssign**. Log in instructions are below.
- You will have five chances to enter your answer. After you have learned how the systems works, this number may be lowered. Watch the announcements.
- The homework is important and necessary to further your understanding of concepts and give you practice working problems. **Using** the homework problems to study the application of concepts will boost your **Exam**grades.

## Exams:

- Four equal-weight, non-comprehensive, 75 minute **Exams** (65%), will test your achievement of understanding gained through the previous course components.
- Exams will be taken in the **Testing Center**, accessible on the South side of the Library.
- You will be allowed one handwritten 3" x 5" card, front and back, for any formulas you wish to write.
- You will be allowed a calculator capable of computing basic functions including trigonometric, exponential and logarithms, but not much more. No access to the web or communication outside the Testing Center is permitted during the test.
- Exams will include two types of problem:

- Problems like the homework (about 1/3 of the Exam). These will be written and graded by hand. Partial credit will be given.
- Conceptual, short answer problems (about 2/3 of the Exam). These will be multiple choice and computer graded. While these questions may involve some very simple calculation, the question is intended to test whether you understand what to do. The calculations will be trivial once you've identified the correct equation.

*All work on exams is expected to be independent of other students and to be free of unauthorized aid. The consequence for academic dishonesty on an exam is a zero on that exam.*

*Requests to reschedule an exam must be made prior to the exam, and must be accompanied by proof of personal illness, death in the immediate family, or a conflicting university-related event.*

## Grade Scale

The following grade scale will be used:

A ≥ 93%	B ≥ 83%	C ≥ 73%
A- ≥ 90%	B- ≥ 80%	C- ≥ 70%
B+ ≥ 87%	C+ ≥ 77%	D+ ≥ 67%

### A note on grading:

Because of the large class size, there is a very small gap between students' scores. This means that no matter where I set a cutoff, there will almost always be some student whose score is within a fraction of a percent of the cutoff. "Surely", that student will argue, "82.6 could be rounded to 83, right?" The problem with this is that there will typically be two or three **other** students with scores between 82.6 and 83. These students' scores would need to be rounded up too.

To see in detail how this works, note that there are approximately 100 students receiving grades corresponding to scores between 75 and 90 percent, with a large number above 90. This means that on average the gap between one student and the next is

$$15 \text{ percent} / 100 = 0.15 \text{ percent}$$

Therefore, for a score of 82.6, there are probably two or three other students with scores between yours and the B-/B cutoff of 83. To raise your score by 0.4 percent would require asking whether those other students should also have their scores raised.

To address this problem, I will add a certain percentage (to be determined) to *all* scores. This will be big enough so that if your final score ends up just below the cutoff, you didn't start out nearly that close. In this way, **everyone has already been rounded up before grades are determined.**

—————

You should always let me know as soon as possible if you see an *error* in grading. The TAs and I are working very hard to insure accuracy.

## WebAssign

Homework is presented and submitted online at [www.webassign.net](http://www.webassign.net), with assignments due on Tuesday evenings a few minutes before midnight (unless otherwise specified). To access WebAssign, you will need to set up a Cengage account; logging into this will take you directly to the WebAssign pages.

Current purchase options for WebAssign are:

- \$90.70 for both the homework and the electronic textbook (eBook) for a single Semester, payable online.
- \$121.00 for both the homework and the eBook for Multi-Term access. This gives you access to the materials as long as the current edition of the text is available.

Since WebAssign will be used for online homework for PHYS 2110 in Fall 2017 and for PHYS 2120 in Spring 2018, students planning to take both courses this year will save money by purchasing Multi-Term access. You may access the homework and the eBook without paying for them for about two weeks, when the grace period ends and payment comes due.

### Instructions for registering for homework:

- (1) Go to the site [www.webassign.net/](http://www.webassign.net/). Click on the **ENTER CLASS KEY** button.
- (2) Enter the class key: **USU** in the first box, **0422** in the second box, and **6960** in the third box. Click the **SUBMIT** button. If you have correctly entered the class key, the class information

Course: PHYS 2110 (Fall 2017) --- Section 001  
Instructor: James Wheeler  
Utah State University, UT

should appear. If so, click the **YES, THIS IS MY CLASS** button.

- (3) On the next webpage leave "I need to create a WebAssign account" selected and click on the **Continue** button.

(4) Fill in the 7 boxes with the required information. **Important:** In the box that asks for your **Student ID number**, use your **A-Number**, **starting with a capital A**. Doing so will ensure that you receive course credit for your WebAssign homework.

(5) Select **CREATE MY ACCOUNT**.

(6) On the next webpage select **LOG IN NOW**.

(7) You should now be at your **Home** page. At this point you can purchase access to the homework and/or the electronic textbook, as described above. You have a brief grace period for using the system without payment, but after that you will need to purchase access to the homework.

## Need Help?

If you find yourself stuck on a particular topic or problem, you may try one or more of the following.

- Review the relevant chapter and/or class notes, and study any relevant example problems.
- Try to solve a similar problem. The solutions to odd numbered problems are given in the back of the textbook.
- Talk with other students in the class. Ask them to explain things to you rather than solving the problem for you.
- Ask for help in recitation.
- Seek help from the class instructor or one of the teaching assistants.
- Take advantage of the Physics Department help center in **SER 219**. This center is staffed during much of the day.

## Environment

We are committed to fostering a nurturing learning environment based upon open communication, mutual respect, and non-discrimination on the basis of race, sex, age, disability, veteran status, religion, sexual orientation, color, or national origin. Academic integrity is expected of all students, and is strictly enforced.

Please advise the instructor if you are a person with a disability and anticipate needing any type of accommodation in order to participate in this class. Accommodations for ADA-documented physical, sensory, emotional, or medical impairments must be coordinated through the Disability Resource Center (DRC) in Room 101 of the University Inn, (435) 797-2444 voice, (435) 797-0740 TTY, (435) 797-2444 VP, or toll free at 1-800-259-2966. Alternate format materials (Braille, large print or digital) are available with advance notice. Veterans may be eligible for accommodations.

USU welcomes students with disabilities. If you have, or suspect you may have, a physical, mental health, or learning disability that may require accommodations in this course, please contact the Disability Resource Center (DRC) as early in the semester as possible (University Inn # 101, 435-797-2444, [drc@usu.edu](mailto:drc@usu.edu)). All disability related accommodations must be approved by the DRC. Once approved, the DRC will coordinate with faculty to provide accommodations.