



Course Syllabus



General Physics – Life Sciences I

PHYS 2110

Fall 2018

Instructor: Dr. Boyd F. Edwards

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Availability: I'm happy to help via e-mail, telephone, or in person anytime that I'm free. Please contact me for immediate help (if I'm available) or to set an appointment.

Prerequisites: Math 1100 or 1210 (calculus). You need algebra and trigonometry for this course, but you do not need calculus (despite the prerequisite). To waive the prerequisite, please contact Karalee Ransom, karalee.ransom@usu.edu.

Texts: (1) *Physics*, Cutnell and Johnson, currently in its eleventh edition; earlier print editions are also acceptable (from any source). An online version of the text is included with your \$140 WileyPLUS subscription for online homework (see below). A downloadable (offline) electronic textbook is available from WileyPLUS for an additional \$35, and a looseleaf copy of the textbook is available from WileyPLUS for an additional \$70.

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

Credits: 4 credit hours

Class: M 5:15 – 7:45 PM and W 5:15 – 6:30 PM

Laboratory: W 7:30 – 9:20 AM (Logan) and W 6:45 - 8:35 PM (Brigham, Logan, Price, and Vernal)

Laboratory Locations and Assistants:

Brigham City: Brigham 151, James Coburn, james.coburn@usu.edu

Logan: SER 112, Davis Muhwezi, dvsmuhwezi@gmail.com

Price: Reeves 246, David Kardelis, david.kardelis@usu.edu

Vernal: B 134, William Booth, wbooth1985@gmail.com

Course: <http://canvas.usu.edu/> (<http://canvas.usu.edu/>)



OUTCOMES

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

- Analyze translational motion of objects using their positions, velocities, and accelerations
- Analyze rotational motion of objects using their angular positions, velocities, and accelerations
- Identify forces and torques on objects, and use Newton's laws to predict their motion
- Apply conservation of energy, linear momentum, and angular momentum to solve problems
- Understand fluid buoyancy and the interplay between pressure and velocity
- Describe internal energy, temperature, heat flow, and the increase of entropy
- Describe biomedical applications of these principles

OVERVIEW

Instead of the traditional format of in-class lectures and out-of-class homework, you will watch videotaped lectures at home and will use class time for questions, review, quizzes, examples, and group problem solving. Lecture PowerPoint presentations, links to YouTube lecture videos, WileyPLUS problem assignments, and practice problems and solutions are available under "Modules" on Canvas. YouTube allows you to watch lectures at up to twice the normal speed, to pause videos, and to replay them, giving you full control over the learning process and optimizing your time spent learning. Working on problems in class with your classmates and the instructor gives you the help that you need, when you need it. The vast majority of my students prefer this format to the traditional format.

Canvas announcements will be used for communications with students outside of class. Please configure your Canvas settings to receive announcements as e-mails. Eight laboratory sessions will be held during the semester (see schedule below) to provide hands-on experience with the material.

PowerPoint lecture presentations and YouTube lecture videos have five main components:

1. *Concepts*. Students are expected to commit certain concepts to memory, and to apply these in quizzes, tests, and problem solving. Concepts are clearly identified in the lecture PowerPoints and lecture videos by a number (like "C1-3") and a red box. These concepts form the basis of physics knowledge in biomedical fields, and help you prepare for entrance exams such as the MCAT.
2. *Demonstrations*. Demonstrations show that physics really works, help you to visualize and remember concepts, and put the fun in physics.
3. *Examples*. Worked-out examples cement understanding by showing how to apply concepts. Examples prepare you for problems, quizzes, and tests.
4. *Clicker Questions*. Clicker questions give you the opportunity for active learning during lectures. For maximum benefit, pause the video, answer the question, and resume the video, comparing your answer with the answer given in the video.
5. *Applications*. Many real-life biomedical applications of physics are mentioned in the lectures. These applications give you a reason to learn the material and show how physics is at the heart of biomedical technologies that have vastly improved healthcare and quality of life.

ASSESSMENTS



1. Class Quizzes (20% of grade). Near the beginning of each class period, a Kahoot! quiz will be given on the concepts in the assigned lecture segments. To take the quiz, students must bring an Internet-capable device (phone, tablet, laptop, etc.) to class, with laptops being preferred. Using a phone can lead to problems when its screen goes dark - touching the screen to wake up your phone can inadvertently enter the wrong answer to a question, and the Kahoot! system does not allow you to change your answer. If you use your phone for quizzes, please change its settings to increase the display lockout time. If you use your laptop for quizzes, please do not refresh your browser to avoid disconnecting from the quiz and losing credit. Students may use copies of PowerPoint lectures, notes, flash cards, etc. during the quizzes, but are expected to work independently of each other during quizzes. The lowest three quiz scores will be dropped.

No quiz makeups are allowed except for mandatory participation in NCAA competitions, interviews for graduate school, required military duties, required participation in legal proceedings, religious holy days, severe injury or illness, or severe injury or illness or death of an immediate family member. When requesting an excused absence from me, please supply evidence of the excuse. For more information, see the USU Excused Absence Policy (catalog.usu.edu).

2. Problem Assignments (15% of grade). WileyPLUS is used for online problem assignments, and offers many learning resources to assist you in working out problems. To register, visit the course Canvas page, select "Modules," select "WileyPLUS Read, Study, and Practice," accept the terms of service, and follow the links to purchase access, to enter your registration code if you already purchased one, or to defer payment during a 14-day grace period. Your registration gives you perpetual access to WileyPLUS, valid for both PHYS 2110 and 2120. Please retain your registration code / receipts to safeguard your purchase.

3. Lab Quizzes (15% of grade). Each lab is worth 10 points, 7 points for completing the lab and 3 for the lab quiz, which has three multiple-choice questions. The quiz is intended to test your understanding of the lab just completed.

4. Tests (50% of grade). There will be four tests, three during the semester and one during finals week. Each test counts for 12.5% of the grade, and will cover approximately one fourth of the material in the course. The last test will not be comprehensive. Each test will have 25 multiple-choice questions including both conceptual questions and quantitative problems. Practice questions and their solutions are available under "Modules" on Canvas. You will take tests at a USU testing center near you, on a testing center computer. Each test may be taken any time during a four-day window (Tuesday - Friday), according to the schedule below, and lasts one hour. Please visit <https://www.usu.edu/campuses/testing/> (<https://www.usu.edu/campuses/testing/>) to schedule an appointment to take each test. Please bring a photo ID, a writing utensil, and a calculator to each test. Backpacks, books, note cards, equation sheets, flash cards, copies of PowerPoint lectures, and other materials are not permitted. Scratch paper will be provided by the testing center, and must be left at the testing center after you complete the test. Internet use during tests is restricted to Canvas. No other Internet access is permitted, including access to the Internet through your phone or calculator. Your phone must be turned off completely and must remain off during the test. Students desiring to use graphing calculators must clear all memory and apps from them before taking the test, and must display their reset screen to the testing proctor before taking the test. Instructions for resetting

TI calculators may be found at <https://education.ti.com/en/us/solutions/test-preparation-tools/tabs/exam-acceptance> (<https://education.ti.com/en/us/solutions/test-preparation-tools/tabs/exam-acceptance>). All work on tests is expected to be independent of other students and to be free of unauthorized aid. The penalty for academic dishonesty is a zero on the test.



5. Extra Credit (0.5% of grade). Each student who completes the IDEA evaluation for the course will receive 0.5% of extra credit. Please do so, as this will assist me to evaluate the course and make improvements.

CLASS PERIODS

Class periods have three parts:

1. First comes a brief review of the concepts covered in the assigned lecture segments, watched prior to class. Questions about these segments may be addressed during this review.
2. Then comes the Kahoot! quiz on these concepts.
3. Then comes group problem solving and discussions about assigned problems, practice problems, and concepts. Thorough understanding of concepts and problems is key to your success. Please use class time to ask questions, of me and of other students, until you are satisfied that you understand thoroughly. Knowing how to solve a problem is not understanding. Understanding is knowing which concepts apply to the problem, why they apply, and how they apply.

GRADE SCALE

A > 93%,

A- > 90%,

B+ > 87%,

B > 83%,

B- > 80%,

C+ > 77%,

C > 73%,

C- > 70%,

D+ > 67%,

D > 63%,

D- > 60%

ENVIRONMENT

Academic integrity is expected of all students in this course, and the USU honor code will be strictly enforced. Any suspected violations of the honor code will be reported promptly. For more information, please

visit <http://studentconduct.usu.edu/studentcode/article6>
<http://studentconduct.usu.edu/studentcode/article6>.



I am 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. Accommodations for physical, sensory, emotional, or medical impairments must be coordinated through the USU Disability Resource Center, at (435) 797-2444. Veterans may be eligible for accommodations. Please advise me if you anticipate needing any type of accommodation to participate in this class.

SCHEDULE

Week of	Monday	Wednesday
Aug 27	1A	1B, Lab 1: Data Analysis
Sept 3	Labor Day Holiday	3A
Sept 10	3B	3C, Lab 2: 1D Motion
Sept 17	4A	4B, Test 1 (Ch 1-3)
Sept 24	4C	5, Lab 3: Newton's 2nd Law
Oct 1	6A	6B
Oct 8	7A	7B, Lab 4: Work and Energy
Oct 15	8A	8B, Test 2 (Ch 4-7)
Oct 22	9A	9B, Lab 5: Ballistic Pendulum
Oct 29	10A	10B, Lab 6: Rotational Motion
Nov 5	11A	11B, Lab 7: Oscillations
Nov 12	12	13, Test 3 (Ch 8-11)
Nov 19	14	Thanksgiving Break

Nov 26	15A	15B
Dec 3	16A	16B, Lab 8: Thermal Equilibrium
Dec 10	Test 4 (Ch 12-16)	Test 4 (Ch 12-16)



Numbers signify the lecture to be watched before class (consisting of one or more lecture segments), the quiz to be given in class, and the problems due at 11:59 PM that night.

Course Summary:

Date	Details
Mon Aug 27, 2018	 Problems 1A https://usu.instructure.com/courses/513346/assignments/2520777 due by 11:59pm