SYLLABUS

General Physics – Life Sciences II
PHYS 2120
Spring 2018

Instructor: Dr. Boyd F. Edwards

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Availability: I'm happy to help via e-mail, telephone, Skype, through the Facebook Group (see below), or in person anytime that I'm free. Please send me an e-mail if you would like to set an appointment.

Prerequisites: Math 1100 or 1210, and PHYS 2110

Texts: (1) *Physics*, Cutnell and Johnson, currently in its tenth edition; the eighth or ninth edition are also acceptable. An electronic "eBook" copy of the tenth edition comes with your WebAssign subscription (see below). Hard copies of the textbook are available from www.chegg.com.

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

Credits: 4 credit hours

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

Laboratory: W 7:30 – 9:20 AM (Logan only) and W 6:45 - 8:35 PM

Laboratory Assistants:

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

Logan: ***

Vernal: William Booth, wbooth1985@gmail.com

Course: http://canvas.usu.edu/

Lectures: https://www.youtube.com/c/PhysicsDemos

Problems: http://www.webassign.net/

Facebook: https://www.facebook.com/groups/phys2120spring2017/

OUTCOMES

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

- Explain the laws governing waves, electromagnetic fields, and their forces on charged particles
- Calculate electric and magnetic fields from symmetric charge and current distributions
- Describe biomedical applications of these laws

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. PowerPoint presentations that are used for the lectures are available on Canvas under "Files -> Lectures", and the videotaped lectures are available on YouTube (see above). YouTube allows you to watch these 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. I encourage you

to configure your Canvas settings to receive announcements as e-mails. All class periods will be videotaped and made available on Canvas under "Panopto". Eight laboratory sessions will be held during the semester (see schedule below) to provide hands-on experience with the material.

Videotaped lectures have five main components:

1. *Concepts.* Students are expected to commit certain fundamental concepts to memory, and to apply these concepts in quizzes, tests, and problem solving. Concepts are clearly identified in the lectures 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 of the concepts by showing how to apply them. 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

Learning is assessed through class quizzes, problem assignments, lab quizzes, and tests.

I. Class Quizzes (20% of grade)

Near the beginning of each class period, a Kahoot! quiz will be given on the concepts in the assigned lectures. To take the quiz, students must bring an Internet-capable device (smart phone, tablet, laptop, etc.) to class, with laptops being preferred. Students may use copies of PowerPoint lectures as well as transcriptions of concepts (on paper or flash cards) during the quizzes, but are expected to work independently of each other during quizzes. The lowest three quiz scores will be dropped. The Kahoot! system does not allow you to change your answer before the time is up. To avoid inadvertently touching the wrong answer when your phone screen goes dark, do the following:

iOS: Settings -> Display & Brightness -> Autolock -> Never
Android: Settings -> Display -> Screen -> 10 minute timeout

To avoid disconnecting from the quiz and losing credit, do not refresh your browser during the quiz.

II. Problem Assignments (15% of grade)

WebAssign is used for online problem assignments and can be accessed through "Modules" in Canvas. WebAssign is free during a 14-day grace period, but requires a subscription afterward. Your subscription automatically grants you access to an electronic "eBook" copy of the textbook – it is not possible to purchase a subscription to WebAssign without access to this eBook. You may purchase a subscription using a credit card or PayPal. If you previously purchased a multi-term subscription to WebAssign, you can link to this account by visiting the WebAssign home page and choosing My Options -> Accounts -> Link Accounts. If you need more time on a problem assignment, you may request an extension through WebAssign.

III. Lab Quizzes (15% of grade)

After completing each laboratory, you will be given a quiz consisting of three multiple-choice questions about the laboratory. Each quiz is worth 5 points: 2 points for taking the quiz and 1 point for each correct answer.

IV. 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 are available in Canvas under "Files -> Practice." 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 five-day window, according to the schedule below, and lasts one hour. Please visit https://www.usu.edu/campuses/testing/ to schedule an appointment to take each test. Doing so is mandatory for some testing centers and strongly recommended for others. 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 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. Students desiring to use a testing center calculator should check with the center to ensure that the desired calculator is available. 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.

V. Extra Credit (1.5% of grade)

There are three sources of extra credit, each worth 0.5% of the grade: (a) a pre-assessment due early in the semester, (b) a post-assessment due late in the semester, and (c) the IDEA evaluation for the course. Each of these sources is worth 0.5% of extra credit. I encourage you to complete all three, as they will assist me to assess learning and to make improvements in the course.

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 answering questions 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. I love questions! Knowing how to solve a problem is not understanding. Understanding is knowing which concepts apply, why they apply, and how they apply.

If you have a question that won't wait until the next class period, you may use the WebAssign "Ask Your Teacher" link (which sends your question to my e-mail, including a copy of the pertinent WebAssign problem) or you may contact me directly by e-mail, telephone, Skype, or in person. You can also work WebAssign practice problems, which are the same problems with different numbers, to avoid using up your five attempts on each numerical problem. You may also take advantage of any local tutoring services, such as the Logan physics help center in SER 219.

GRADE SCALE

A ≥ 93%,	B ≥ 83%,	C ≥ 73%,	D ≥ 63%,
A– ≥ 90%,	B– ≥ 80%,	C– ≥ 70%,	D- ≥ 60
B+ ≥ 87%,	C+ ≥ 77%,	D+ ≥ 67%,	

ENVIRONMENT

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. Academic integrity is expected of all students, and is strictly enforced. 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	Tuesday	Wednesday
Jan 8	16A		16B
Jan 15	Martin Luther King, Jr. Holiday		17A
Jan 22	17B		18A Lab 1: Standing Waves
Jan 29	18B		19A Lab 2: Electric Fields
Feb 5	19B Test 1 (Ch 16-19)	Test 1 (Ch 16-19)	20A Test 1 (Ch 16-19)
Feb 12	20B		20C Lab 3: Resistive Circuits
Feb 19	President's Day Holiday	21A	21B
Feb 26	22A		22B Lab 4: RC Circuits
Mar 5	Spring Break	Spring Break	Spring Break
Mar 12	23A		23B Lab 5: LCR Circuits
Mar 19	24A Test 2 (Ch 20-23)	Test 2 (Ch 20-23)	24B Test 2 (Ch 20-23)
Mar 26	25A		25B
Apr 2	26A		26B, Lab 6: Refraction
Apr 9	27 Test 3 (Ch 24-27)	Test 3 (Ch 24-27)	28 Test 3 (Ch 24-27)
Apr 16	29		30 Lab 7: Diffraction
Apr 23	31		32 Lab 8: Spectroscopy
Apr 30	Test 4 (Ch 28-32)	Test 4 (Ch 28-32)	Test 4 (Ch 28-32)

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. Class will be held on Tuesday, February 20, following the Monday class schedule.