SYLLABUS
General Physics – Life Sciences I
PHYS 2110
Fall 2020

Instructor: Tonya B. Triplett

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Availability: I will keep regular office hours on T/R 1:30-4:00 and Wednesday, pretty much all day. If you need help outside those hours, please send me e-mail to set an appointment. If we can meet in person in my office at all, we will do so one student at a time. I will answer email and use Zoom for office hours.

Prerequisites: Math 1100 or 1210

Texts: (1) *Physics*, Cutnell and Johnson, currently in its 11th edition; the eighth to tenth editions are also acceptable. An electronic "eBook" copy of the 11th edition comes with your WileyPLUS access code and no other materials are needed.

>   (2) *Laboratory Manual*, available at the campus bookstore (under James Coburn)

Credits: 4 credit hours

Class: T/R 12:00-1:15 ESLC 130

Laboratory: As registered in SER 112. You will meet your TA there.

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

Lectures: EITHER in person (use sign ups) or broadcast on Zoom. Also recorded.

Homework: WileyPLUS access through Canvas

OUTCOMES

The primary goal of the class is to teach you how physicists view the world, and help you use the tools of physics to evaluate situations and real-life problems. We will work within a learning hierarchy of (1) facts that you know, (2) concepts you understand, and (3) tasks, such as problem solving and lab, which you are able to do.
The course will specifically address these Intended Learning Outcomes:
Students 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

CONCEPTS

Students are expected to commit certain fundamental concepts to memory, and to apply them in solving problems on homework and examinations. Concepts will be covered thoroughly in class. Note cards are not permitted during examinations. I will prepare an equations page for each section of the course that you will be provided during the exam. It will contain some, but not all, equations needed. You will be required to memorize many equations for problem solving.

COMPONENTS

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

I. Lecture

Lectures will be held T/R in ESCL 130. Lectures will cover concepts and examples to prepare you for homework assignments and exams. Reading the pertinent sections of the textbook beforehand will help you prepare for each lecture.

II. Recitation

Recitations sections are held on Friday. All recitations will be online only and have two parts: homework review and a quiz. A video of each of these will be pre-recorded and you can watch it as needed. A TA will also be available for Zoom questions as needed. The quiz question is intended to be VERY challenging and to stretch your abilities in problem solving. It is not representative of the level of difficulty on tests. Recitations will begin week 2.

III. Laboratory

Eight two-hour laboratories are scheduled throughout the semester to give you hands-on experience with the material. Four of the labs will meet in person, and four will be completed online. Because of COVID space limits, missed lab cannot be made up. You have 4 appointments during the semester and it is vital that you not miss one. Laboratories will begin the first week, with online, then the second week with in person.

ASSESSMENTS

Your learning will be assessed through homework assignments, lab quizzes, recitation quizzes, examinations, and pre/post-tests.

I. Homework (20% of grade)

We will use the WileyPLUS system for homework and for your textbook. Access is directly through Canvas and instructions for your first log-on are there for you. In the program, each question part is worth 1 point toward your total homework score. Your homework average is the number of correct answers divided by the total number of questions. I expect you to do every problem, enough times to get it right. The program will give you 5 chances, but you may ask any of the TAs for more if you need it. Homework is practice towards mastery, and you should work until you can solve each problem. Logical deadlines for this work exist, but if you still do not understand, you may get personal help and a deadline extension. DON'T GIVE UP.

II. Lab and Lab Quizzes (20% of grade)

After completing each laboratory, you will be given a quiz consisting of three multiple-choice questions. The quizzes encourage you to participate actively in the laboratory and provide a record of this participation. Attendance and completion of the lab tasks will be graded 12 points, and then each quiz question is worth 1 point. Each lab is therefore worth 15 points.   There will be 8 labs throughout the semester and you will NOT drop any scores.

III. Recitation Quizzes (8% of grade)

Recitation is designed to help you with homework problems and/or conceptual problems encountered in the week's material. Each week, ask yourself how the homework went for you. Did you need help from others? Did you need multiple tries on most problems? If so, recitation is for you!   The quiz

for recitation is a somewhat complex problem and will be assigned as a Canvas quiz. During this exercise, you are encouraged to ask your TA for <u>any help at all</u>. The goal is for you to complete the problem correctly. Each time you ask a question, or view the video, stop as soon as you have the information you need to continue further with the problem, then try working again, until you can complete it.

IV. Exams (50% of grade)

There will be four exams, evenly spaced and weighted throughout the semester as shown in the schedule. You will take all exams online using Panopto and may elect to take it anytime within the scheduled window. The final examination will <u>not be</u> comprehensive. Backpacks, books, note cards, flash cards, copies of PowerPoint lectures, and other materials are not permitted. You will be allowed to use your calculator, a data page (as attached, or available in Canvas), and as much scratch paper as you need. Internet use during tests is restricted to Canvas. No other Internet access is permitted, including access through your phone or calculator. Like the homework, the exams will include both conceptual and quantitative problems. Some questions will test your knowledge of concepts identified in class. Others will be variations on homework problems and in-class examples, while yet others will test your ability to extend concepts to new problems. *All work on exams is expected to be independent of other students and to be free of unauthorized aid. The minimum consequence for academic dishonesty on an exam is a zero on that exam.*

V. Assessment of Understanding (2% of grade)

In lieu of a final exam, a set of pre-test and post-test will be a required part of the course. Grading for this will be as follows:
1. For taking the pre-test and completing all problems (correctly or incorrectly, but not blank), a participation score of 10/10 will be given. The quiz will be scored, but will not count towards your grade. This has to be manually entered so do not worry that only the graded quiz shows.
2. For taking the post-test and completing all problems, AND <u>showing improvement</u> from the pre-test score, a score of 10/10 will be given.

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. You can use the "link to text" option in the problem to do this.
- Try to solve a similar problem. The solutions to odd numbered problems are given in the back of the textbook and many additional problems are available in Wiley in "Read/Study/Practice"
- Talk with other students in the class. Ask them to explain things to you rather than solving the problem for you. I will build an open "Homework Zoom" room for the class. The TAs and I will check in and out of the room as we can.
- Ask for help from a recitation TA.
- Seek help from the class instructor or one of the many teaching assistants.

GRADE SCALE

The following grade scale will be used:

A ≥ 93.0%,	C ≥ 73.0%,
A− ≥ 90.0%,	C− ≥ 70.0%,
B+ ≥ 87.0%,	D+ ≥ 67.0%,
B ≥ 83.0%,	D ≥ 60.0%,
B− ≥ 80.0%,	F < 60
C+ ≥ 77.0%,	

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.

Materials for Persons with Disabilities: 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). All disability related accommodations must be approved by the DRC. Once approved, the DRC will coordinate with faculty to provide accommodations.

Honor Code: The honor code will be strictly enforced in this course. Any suspected violations of the honor code will be promptly reported to the honor system. For more information please visit:
http://www.usu.edu/policies/PDF/Acad-Integrity.pdf

SCHEDULE

ALL DATES ARE TENTATIVE AND WILL BE ADJUSTED TO MEET THE GOALS OF THE COURSE

Week of		Lab Your Section	Tuesday (lecture)	Thursday (lecture)	Friday (Recitation)
Aug	31	Lab 1- online Intro to Data Analysis	1. Intro and Mathematical Concepts (1.2-1.3)	2. Mathematical Concepts (1.3-1.5)	Pre-test due No Recitation HW zero
September	7	2A. Motion in 1 Dimension	3. Mathematical Concepts; Displacement and Velocity in 2 Dimensions (1.6-1.8, 2)	4. Displacement and Velocity in 2 Dimensions cont. (2-3.1)	Recitation 1 HW 1 due 11:59 PM
	14	2B. Motion in 1 Dimension	5. Equations of Kinematics (3.1-3.2)	6. Projectile Motion (3.3)	Recitation 2 HW 2 due 11:59 PM
	21	No lab	7. Newton's Laws (4.1-4.4) **EXAM I Lectures 1-7, CH 1-3**	8. Newton's Laws (4.5-4.8)	Recitation 3 HW 3 due 11:59 PM
	28	Lab 3A Newton's 2nd Law	9. Forces and Newton's Laws (4.9-4.11)	10. Uniform Circular Motion (5.1,2,3,6)	Recitation 4 HW 4 due 11:59 PM

October	5	Lab 3B Newton's 2nd Law	11. Work (6.1-6.2)	12. Energy and Conservation (6.3,4,5,7)	Recitation 5 HW 5 due 11:59 PM
	12	Lab 4- online Work and Energy	13. Impulse and Momentum (7.1-7.2)	14. Collisions (7.3)	Recitation 6 HW 6 due 11:59 PM
	19		15. Center of Mass (7.5) **EXAM II Lectures 8-15 CH 4-7**	16. Rotational Motion (8.1-8.2)	Recitation?
	26	Lab 5B- online Ballistic Pendulum Lab 6A: Rotational Motion	17. Rotational Kinematics (8.3, 8.4, 8.6)	18. Rotational Dynamics (9.1, 9.2, 9.4)	Recitation 7 HW 7 due 11:59 PM
	2	Lab 6B: Rotational Motion Lab 5A- online Ballistic Pendulum	19. Rotational Energy and Momentum (9.5, 9.6)	20. Springs and Simple Harmonic Motion (10.1, 10.2)	Recitation 8 HW 8 due 11:59 PM
November	9	Lab 7A Harmonic Oscillations	21. Harmonic Motion and Resonance (10.3, 10.4, 10.6)	22. Fluids (11.1-11.3)	Recitation 9 HW 9 due 11:59 PM
	16	Lab 7B Harmonic Oscillations	23. Fluids: Pascal, Archimedes (11.4-11.7)	24. Fluids: Bernoulli (11.9) **EXAM III Lectures 16-24 CH 8-11**	Recitation 10 HW 10 due 11:59 PM
	23		25. Temperature (12.1, 2, 4, 5)	Thanksgiving Break	
	30		26. Heat (12.6-8) Transfer of Heat (13.1-3)	27. Ideal Gas Law (14.1-14.4)	Recitation 11 HW 11 due 11:59 PM
Dec	7	Lab 8- online Thermal Equilibrium	28. Thermodynamics (15.1-5)	29. Thermodynamics (15.7-12)	Recitation 12 HW 12 due 11:59 PM
	14		**EXAM IV Lectures 25-29, CH 12-15**		