

# SYLLABUS

## General Physics – Life Sciences I PHYS 2110 Fall 2018

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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.

**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 code (see below).

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

**Credits:** 4 credit hours

**Class:** T 12:00-1:15 ESLC 130

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

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

**Lectures:** under Canvas/Panopto

**Problems:** WileyPLUS

## 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

## 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. A recitation section is a small group of students enrolled in the course, led by a teaching assistant. These sections give you an opportunity to ask questions and work on problems in order to deepen your understanding of the material in preparation for examinations. 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. 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 will begin week 1.

## ASSESSMENTS

Your learning will be assessed through homework assignments, lab quizzes, recitation quizzes, and examinations.

### 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. No credit will be given for problem sets completed after the deadline.

### 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 (10% of grade)

Recitation is designed to help you with homework problems and/or conceptual problems encountered in the week's material. In an effort to allow you maximum flexibility in learning, recitations are not required to be attended every week. Overall, you will be graded for your work on half of the recitations although you may choose to attend more. A pre-assessment will be available through Canvas to let you see where you stand. 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. You will drop your lowest 7 recitation quiz scores.

#### 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 in the testing center and may elect to take it during the class time set aside for the test or within the posted window. The final examination will not be comprehensive. 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. Those desiring to use graphing calculators must remove all equations from them prior to the examination, and must present them to teaching assistants upon request to verify compliance. 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. Extra Credit

Students frequently ask if there will be extra credit. While it is not my intent to structure any credit at this time, I will let you all know of any opportunity.

### 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 business day.

### GRADE SCALE

The following grade scale will be used:

A  $\geq$  93.0%,  
A-  $\geq$  90.0%,  
B+  $\geq$  87.0%,  
B  $\geq$  83.0%,  
B-  $\geq$  80.0%,  
C+  $\geq$  77.0%,

C  $\geq$  73.0%,  
C-  $\geq$  70.0%,  
D+  $\geq$  67.0%,  
D  $\geq$  60.0%,  
F < 60

## 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](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.

**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	Tuesday (lecture)	Thursday (lecture)	Friday (Recitation)
Aug 27	Lab 1 Intro to Data Analysis	1. Intro and Mathematical Concepts (1.2-1.4)	2. Mathematical Concepts (1.5-1.8)	
Sep 3		3. Displacement and Velocity in 2 Dimensions (2-3.1)	4. Displacement and Velocity in 2 Dimensions cont. (2-3.1)	HW 1 due 11:59 PM
Sep 10	Lab 2 Motion in 1 Dimension	5. Equations of Kinematics (3.2)	6. Projectile Motion (3.3)	HW 2 due 11:59 PM
Sep 17		7. Concluding Concepts (3.3) <b>EXAM I</b> Lectures 1-7, <b>CH 1-3, HW 1-3</b>	8. Newton's Laws (4.1-4.6)	HW 3 due 11:59 PM
Sep 24	Lab 3 Newton's 2 <sup>nd</sup> Law	9. Forces and Newton's Laws (4.7-4.11)	10. Uniform Circular Motion (5.1,2,3,6)	HW 4 due 11:59 PM
Oct 1		11. Work (6.1-6.2)	12. Energy and Conservation (6.3,4,5,7)	HW 5 due 11:59 PM
Oct 8	Lab 4 Work and Energy	13. Impulse and Momentum (7.1-7.2)	14. Collisions, Center of Mass (7.3, 7.5)	HW 6 due 11:59 PM
Oct 15		15. Concluding Concepts (7) <b>EXAM II</b> Lectures 8-14, <b>CH 4-7, HW 4-6</b>	16. Rotational Motion (8.1-8.2)	HW 7 due 11:59 PM
Oct 22	Lab 5 Ballistic Pendulum	17. Rotational Kinematics (8.3, 8.4, 8.6)	18. Rotational Dynamics (9.1, 9.2, 9.4)	HW 8 due 11:59 PM
Oct 29	Lab 6 Rotational Motion	19. Rotational Energy and Momentum (9.5, 9.6)	20. Springs and Simple Harmonic Motion (10.1, 10.2)	HW 9 due 11:59 PM
Nov 5	Lab 7 Harmonic Oscillations	21. Harmonic Motion and Resonance (10.3, 10.4, 10.6)	22. Fluids (11.1-11.4)	HW 10 due 11:59 PM
Nov 12		23. Fluids: Pascal, Archimedes, Bernoulli (11.5, 11.6, 11.7, 11.9)	24. Concluding Concepts (11) <b>EXAM III</b> Lectures 16-23, <b>CH 8-11, HW 7-11</b>	HW 11 due 11:59 PM
Nov 19		25. Temperature (12.1, 2, 4, 5)	Thanksgiving Break	
Nov 26		26. Heat (12.6-8) Transfer of Heat (13.1-3)	27. Ideal Gas Law (14.1-14.4)	HW 12 due 11:59 PM
Dec 3	Lab 8 Thermal Equilibrium	28. Thermodynamics (15.1-5)	29. Thermodynamics (15.7-12)	HW 13 due 11:59 PM
Dec 10			<b>EXAM IV</b> Lectures 25-29, <b>CH 12-15, HW 12-13</b>	

