

# PHYS 2310: Physics for Scientists I Syllabus

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## Instructor

Dr. Leda Sox

## Email

Leda.sox@gmail.com

## Office

SER 207

## Office Hours

Wednesdays 2-4 pm

## Prerequisites

MATH 1210 (Calc I)

## Lecture

MWF 10:30-11:20 am

SER 122

## Recitation

M 3:30-4:20 pm

Eccles Science Learning

Center 046

## Course Overview

This is an introductory, calculus-based physics course intended for those students majoring in Physics. This is the first in a two-semester introductory physics sequence. In this first semester we will explore Newtonian mechanics, oscillations, and thermodynamics. The course requires a working knowledge of calculus—you should either have completed or be currently enrolled in a calculus I course (e.g. USU MATH 1210). After finishing this course, you should not only be proficient in problem solving and applying physical laws, but also have general understanding of what it's like to work as a professional physicist.

## Required Text

*Essential University Physics Volume 1*, 3<sup>rd</sup> Edition, Richard Wolfson

Hard copy or electronic version from homework site (see Homework section below for ordering information).

## Resources

**Class website:** [canvas.usu.edu](https://canvas.usu.edu)

Our Canvas page will house all course materials, class announcements, exams and grades

**Homework website:** [masteringphysics.com](https://masteringphysics.com)

You will use MasteringPhysics to complete all homework assignments for the semester

**Physics Learning Center in SER 219:** Tutors will be available in the Learning Center to help with homework. The Learning Center schedule will be posted on the door and at [physics.usu.edu/classes/learning-center](https://physics.usu.edu/classes/learning-center).

## Components of Course

**Reading:** You will need to read the corresponding textbook chapters (see Course Schedule) before you come to class. By coming to class with the reading done, you will know what questions and clarifications you can ask of me in lecture. The lecture will not stand alone, so to get a full understanding of the course material it is imperative that you stay up-to-date on reading.

**Lecture:** Attending lecture will be essential to your success in the course. In lecture new material will be presented as well as problem-solving strategies. Lecture will also provide a time for group discussion and problem solving.

**Explorations in Physics:** This will be different from most recitation-type courses you attend at USU. While we will take time to review homework questions and prepare for upcoming exams, we will also work on group projects, host speakers, have demo days, discuss scientific journal articles, and have individual mentoring sessions. Essentially this time will be used to introduce you to the world of professional physicists.

**Homework:** Problem solving is crucial to learning Physics, so homework will be worth a significant amount of your grade. There will be two parts to each homework (HW) assignment

- 1) **MasteringPhysics (digital) problem sets:** These will be completed online through the MasteringPhysics tab on Canvas.

There are 4 options for gaining access to MasteringPhysics:

- 1) Hard copy of text book+MasteringPhysics access code from the USU Bookstore. Cost: \$145
- 2) eText+MasteringPhysics access code from the USU Bookstore. Cost: \$140
- 3) \*eText+MasteringPhysics access code direct from publisher (Pearson). Cost: \$116
- 4) \*MasteringPhysics access code direct from publisher (Pearson). Cost: \$69

(With this option you would only have access to MasteringPhysics and have to buy a copy of the text—print or electronic—separately from Pearson or elsewhere.)

\*You can purchase option 3 or 4 by following the registration steps below

To gain access to MasteringPhysics through Canvas: Go to MasteringPhysics Registration pdf in the Files tab on Canvas.

- 2) **Analog problems:** These will be completed the old-fashioned way—by hand, on paper. I will select two problems from each MasteringPhysics assignment which you will need to write up and turn in to me as a hard copy. This way, I can give you feedback on your individual problem-solving methods. Your HW assignment will not be considered complete until I receive the hard copy, which will be due at the beginning of class on the Wednesday following the HW due date and is worth 20% of each HW grade.

MasteringPhysics HW assignments will be due each Tuesday at 11:59 pm starting Sept 5<sup>th</sup>, 2017. Due dates for each assignment can be found on the MasteringPhysics site. Analog problems will be due each Wednesday at the beginning of class starting Sept 6<sup>th</sup>, 2017. No credit will be given for late assignments.

**Exams:** There will be four exams (3 hour exams+1 final exam) throughout the semester. The final will be mostly material from the final quarter of the course, with a small amount of comprehensive material covered throughout the semester. Each student's worst test score will be dropped, making each test worth 20% of your total grade. Tests will be administered in the USU Testing Center ([ais.usu.edu/testing/](http://ais.usu.edu/testing/)). More information on how to schedule a time to take a test will be given closer to the exam date.

**Group Projects:** There will be two group projects in the course, which will include write-ups and presentations during explorations. The subject of these projects will be discussed later during explorations. While these are group projects, each student will be given an individual score to assure that everyone does their part.

**Participation:** On the first and last day of class, I will hand out a concept inventory for each student to take. Though this may seem like a "test" you will not be graded on correctness, but rather given participation credit (2%) for doing your best. Concept Inventories are tools used by educators to gather data on student learning. While you will not be graded on this assignment, it is important for you to do your best on each concept inventory in order for the department to gather meaningful data. The final 3% of your participation grade will

be determined based on your attendance and involvement in lectures and explorations.

## Evaluation

Grades will breakdown as follows:

|                 |      |
|-----------------|------|
| Homework:       | 20%  |
| Exams:          | 60%  |
| Group Projects: | 15%  |
| Participation:  | 5%   |
| Total:          | 100% |

## Grading Structure

93-100 A  
90-92 A –  
87-89 B +  
83-86 B  
80-82 B –  
77-79 C+  
73-76 C  
70-72 C –  
67-69 D+  
63-66 D  
60-62 D –  
<60 F

## Rescheduling Exams

There are only two valid reasons for rescheduling one of the first three exams. Documentation must be provided for both reasons, as described below. The instructor must be notified before the exam.

- 1) **Medical:** You may reschedule an exam if you are too sick to take the exam. If you are too sick to take the exam, then you are sick enough to visit the infirmary and obtain a note explaining the extent of your illness. You must provide the instructor with such a note in order to reschedule an exam for medical reasons.
- 2) **University business:** If you are on travel for university business, then you may reschedule an exam. Again, you must provide written documentation from the sponsoring organization of your participation in said university business.

## Getting Help with the Course

If you feel comfortable, please ask questions about your assignments and exams in class or recitation. There is a good chance that your classmates have similar questions, so it saves time to have a group discussion. Should you need individual help, stop by my office hours (posted at the top of this syllabus) or email me to make an appointment. If you have a quick question that doesn't need to be answered in person, please feel free to email me.

Additionally, the tutors in the Physics Learning Center (SER 219) are at your disposal for help with homework and test review. See information above in the Resources section for information on Learning Center hours.

## **Inclusion in the Learning Environment**

Physics is not a diverse field and while science should be one of the most objective topics you study as a college student, that is not always the case. With that in mind, I will do my best to include examples and language that is welcoming to all races, genders, ethnicities, sexual orientations, ages, socioeconomic groups, religious affiliations, and abilities. As the instructor, it is my duty to assure that all students in the course feel acknowledged and supported. Should you have suggestions or concerns, I encourage feedback on how I can make the course more relevant to students from diverse backgrounds. As students, it is your duty to both respect your fellow students' ideas, opinions, and backgrounds and actively participate in class so your voice is heard. Although the scholarly field of physics is lacking in diversity, it is important to remember that physics is essentially the study of the world around us. For that reason, those of us practicing physics should welcome all people to share in our understanding. Note that the Disability Resource Center is also at your disposal, information for the DRC is given below.

## **Disability Resource Center**

Students with ADA-documented physical, sensory, emotional or medical impairments may be eligible for reasonable accommodations. Veterans may also be eligible for services. All accommodations are coordinated through the Disability Resource Center (DRC) in Room 101 of the University Inn, (435) 797-2444. Please contact the DRC as early in the semester as possible. Alternate format materials (Braille, large print, digital, or audio) are available with advance notice.

## **Additional Fee**

There is a \$10 fee for this class. It covers classroom supplies, as well as equipment, maintenance and supplies for demonstrations. (Note: some scholarships will not pay for this fee, even though they pay full tuition costs. Scholarship students have been dropped from this class without notice for not paying the fee.)

## **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>.

## Course Schedule

| <b>Week of</b> | <b>Monday</b><br>(Lecture,<br><i>Explorations</i> )         | <b>Tuesday</b><br>(HW due at<br>11:59 pm) | <b>Wednesday</b><br>(Lecture) | <b>Friday</b><br>(Lecture or <i>Exam</i> )                |
|----------------|---|---|-------------------------------|---|
| <b>28 Aug</b>  | CH 1,<br><i>Mentoring Sessions</i>                          | --  | CH 2                          | CH 3  |
| <b>04 Sept</b> | NO CLASS<br>(Labor Day)                                     | <b>HW 1</b>                               | CH 3                          | CH 4  |
| <b>11 Sept</b> | CH 4,<br><i>Problem Solving,</i><br><i>Project Overview</i> | <b>HW 2</b>                               | CH 5                          | CH 5  |
| <b>18 Sept</b> | CH 6,<br><i>Review</i>                                      | <b>HW 3</b>                               | CH 6                          | <b><i>Exam 1: CH 1-5</i></b>                              |
| <b>25 Sept</b> | CH 7,<br><i>Demo 1</i>                                      | <b>HW 4</b>                               | CH 7                          | CH 7  |
| <b>02 Oct</b>  | CH 8,<br><i>Speaker</i>                                     | <b>HW 5</b>                               | CH 8                          | CH 9  |
| <b>09 Oct</b>  | CH 9,<br><b><i>Midterm Projects</i></b>                     | <b>HW 6</b>                               | CH 10                         | CH 10   |
| <b>16 Oct</b>  | CH 11,<br><i>Review</i>                                     | <b>HW 7</b>                               | CH 11                         | CLASS ON THURS<br>19 OCT<br><b><i>Exam 2: CH 6-10</i></b> |
| <b>23 Oct</b>  | CH 12,<br><i>Demo 2</i>                                     | <b>HW 8</b>                               | CH 12                         | CH 13   |
| <b>30 Oct</b>  | CH 13<br><i>Journal Club</i>                                | <b>HW 9</b>                               | CH 14                         | CH 14   |
| <b>06 Nov</b>  | CH 14,<br><i>Speaker</i>                                    | <b>HW 10</b>                              | CH 15                         | CH 15   |
| <b>13 Nov</b>  | CH 16,<br><i>Review</i>                                     | <b>HW 11</b>                              | CH 16                         | <b><i>Exam 3: CH 11-15</i></b>                            |
| <b>20 Nov</b>  | CH 17,<br><b><i>Final Projects</i></b>                      | <b>HW 12</b>                              | NO CLASS<br>(Thanksgiving)    | NO CLASS<br>(Thanksgiving)                                |
| <b>27 Nov</b>  | CH 17,<br><i>Mentoring Sessions</i>                         | <b>HW 13</b>                              | CH 18                         | CH 18   |
| <b>04 Dec</b>  | CH 19,<br><i>Speaker</i>                                    | <b>HW 14</b>                              | CH 19                         | Review  |
| <b>11 Dec</b>  | <b><i>FINAL EXAM: CH 16-19 (some comprehensive)</i></b>     |   |                               |   |