

# Physics 2210: Physics for Scientists and Engineers I

Course Syllabus, Fall 2023, Physics & Astronomy Department

## Instructor Information

Instructor: Dr. Rhett Zollinger (he/him/his)  
Office: South Physics 224  
Email: rhett.zollinger@utah.edu

**UPDATED:** Aug 10, 2023. Please note that this syllabus is subject to change. If a change occurs, students will be notified and given time to make any adjustments.

## General Course Information

Course Website: Access through canvas

Prerequisite: 'C-' or better in ((PHYS 1500 AND (MATH 1060 OR MATH 1080)) OR (MATH 1210 OR MATH 1215 OR MATH 1250 OR MATH 1310 OR MATH 1311))

Textbook: The tuition and fees for this course provide electronic access to our textbook and homework system. If you are enrolled in this course, you do **not** need to buy additional course materials. More about the textbook later in this document.

Class Times: This course consists of two 80-minute lectures and two 50-minute Discussion Sections per week.

**IMPORTANT:** You are required to attend the Lecture Section and Discussion Section in which you are enrolled. Additionally, you may not attend Lecture and Discussion Sections in which you are not enrolled.

## Overview and Learning Objects

This is the first semester of a two-semester sequence in introductory physics. In this class we try to understand how objects move and interact, how energy transfer affects our universe, and other fundamental questions. Basically, we want to figure out how the world works and use these ideas to solve problems and make predictions. Specific topics in classical mechanics include kinematics, dynamics, energy, momentum, rotation of a rigid body, oscillations and waves. The class will assume a working knowledge of calculus.

After successful completion of this course, students should be able to:

- Apply and demonstrate conceptual understanding of course topics.
- Identify applicable principles in real-world situations and apply appropriate simplifying assumptions.
- Follow a consistent problem-solving strategy that involves qualitative and quantitative reasoning.
- Extract quantitative information from a given physics problem and identify known and unknown quantities.
- Think critically about and then write out, with appropriate diagrams as necessary, a complete solution to a physics problem, explaining in complete sentences the steps used.

Course objectives will be achieved through a combination of classroom discussion, independent problem solving (nice way of saying homework), and interactive classroom activities.

Most of you, if not all, are taking this course because it is a prerequisite for another course or it is required by your major. As such, I have a special obligation to cover a large amount of material and to ensure a certain quality of understanding.

### Your Teaching Team

This course will be administered by a team of individuals that include myself, the lead instructor, and a dedicated group of teaching assistants and learning assistants (described below). We will strive to create an inclusive community that promotes respect and support for all without prejudice or discrimination. Both the instructional staff and students are expected to commit to creating an environment that facilitates inquiry and self-expression in the classroom.

#### **Teaching Assistants (TAs)**

Teaching Assistants are graduate or undergraduate students in physics, they are working towards their Bachelor, Master or PhD degree in physics. They will lead discussion sections, staff Study Hall, hold Office Hours, present Reviews and grade Exams and Problem Sets. The names and contacts of the TAs will be posted on the Canvas website on the Teaching Staff page.

#### **Learning Assistants (LAs)**

Learning Assistants are undergraduate students who have taken this course previously, or a similar course, and who receive special training on how to help students learn science (see more details on the U of U Learning Assistant program page). LAs will help during class and discussion sections to facilitate student learning, they will also staff Study-Hall and hold Office Hours. LAs are not responsible for grading assignments and can be thought of as peer mentors. The names and contacts of the LAs will be posted on the Canvas website on the Teaching Staff page.

### Accessibility and Accommodations

I want to provide you with the necessary tools to learn and succeed in my class. This is an “in-person” course, so it is expected and important that you attend lecture and your discussion section. I understand that you will not always be able to attend lecture. Lecture slides will be posted and the assigned textbook reading will also be a valuable source for learning the material. A daily schedule of the reading sections will be posted on canvas.

- If you have a formal accommodation through the Center for Disability and Access, please reach out to me as soon as possible during the first weeks of class. I’ll be happy to meet with you to discuss how I can best meet your needs in my class.
- If you don’t have a formal accommodation from the CDA (Center for Disability and Access) but feel you may need one, I encourage you to visit the CDA website to learn about the process and eligibility. You are always welcome to talk with me directly if you find any aspect of the course inaccessible. I am happy to discuss any issues and try to find a solution that is also fair and equitable to others in the class.

### Meeting with the Instructor

I will be available for short questions after each class and to schedule one-on-one appointments. For homework questions or content questions, the best place to seek help is during Study-Hall. You can email me to setup a meeting time or ask a question about course policy. Again, if you have homework questions, the best place for help is study-hall.

### Study-Halls

The goal of study hall is to provide a place where you can come to do the homework and study for quizzes and exams individually or with other classmates. The instructor or TAs and LAs will be there and available to advise you, and answer questions. It is a great place to get to know others and get some work done at the same time.

Study-hall will mostly be held in-person in **JFB 209**. You are not obligated to come to study-hall. Think of it as an extra resource that could be very valuable in helping you learn and master the course content, and possibly a fun place to make some new friends. You can drop in at any of the available times. If you ever find yourself struggling with the material, **you should come to study-hall!**

Study hall times: -- please refer to our canvas homepage for study-hall times

### Mathematics

While physics is not a branch of mathematics, mathematics is used heavily in physics. It is important that you have a working knowledge of basic algebra and right-triangle trigonometry. This is also a calculus-based course. Concepts such as derivatives and integrals should be familiar to you. If you have any concern about your current math skills please come and see me as soon as possible.

### Reading the text book

You need to come to class prepared for the lecture, which means having read the sections in the chapter **BEFORE** we discuss it in class. Doing this will significantly increase the benefits you receive by attending class. This allows us to spend less time covering basic definitions and mathematical derivations and spend more time focusing on application. By "reading", I don't mean merely glancing at, or even skimming the respective pages. Attempt to really understand the material in the assigned sections. I highly recommend making written notes from your reading, recording important definitions, concepts and equations, as well as noting any questions you have on the material. A schedule of what sections will be covered on a given day is listed on our canvas course page.

### Textbook, Inclusive Access and MasteringPhysics

The book adopted for this course is Physics for Scientists and Engineers: A Strategic Approach with Modern Physics with MasteringPhysics, Fifth Edition, by Randall D. Knight. The electronic version of the textbook and associated resources and access to MasteringPhysics are available to you as part of the Inclusive Access Program. The Inclusive Access Program delivers all required course material as part of your tuition or fees. **If you are enrolled in this course, you do not need to buy course material as they will be provided to you starting the first day of class.** You will get the required resources and access to the book directly through the Canvas site. Homework submission will happen through MasteringPhysics as well as access. The instructions on how to access MasteringPhysics are posted on the Canvas site.

## Course Policy

1. **Grading:** Contributions to your grade come from three separate elements. The breakdown by percentage is:

MasteringPhysics Homework:	24%
Pre-Lecture Assignments	6%
Discussion Sections	10%
Dynamic Study Modules	10%
<b>Exams:</b>	
3 Midterms	36%
1 final	14%
<b>Total:</b>	= 100%

At the end of the semester your final grade will be determined after applying the weighting listed above. The grading may be adjusted in the case it becomes obviously unfair. **Your scores are calculated to the nearest tenth of a percent and I do not round up.**

A	93 – 100%
A-	90 – 93%
B+	87 – 90%
B	83 – 87%
B-	80 – 83%
C+	77 – 80%
C	73 – 77%

C-	70 – 73%
D+	67 – 70%
D	63 – 67%
D-	60 – 63%
F	Below 60%

2. **Homework:** A large part of physics is developing problem solving skills. Like most everything in life, these skills are best obtained through practice. Even though homework is not the most significant contributor to your final grade, you must do the homework to do well in this course. The assigned problems are meant to test your understanding of course topics. They will also provide meaningful preparation for quizzes and exams. You are encouraged to discuss homework problems with your classmates and teaching staff, especially during study-hall.

Homework sets are posted on the course website. They are typically due on Thursday nights at midnight. Problems and questions will be submitted online through MasteringPhysics. You will have multiple attempts, hints available, and immediate feedback on your answers. You will access MasteringPhysics through canvas.

There will be about 14 homework assignments, roughly one per week. **The lowest two masteringphysics homework scores will be dropped** when calculating your final homework grade. This is primarily to allow for scheduling conflicts and emergencies, including sickness. I strongly suggest you complete every homework assignment. Late masteringphysics homework will be accepted following the policy outlined later in the syllabus. Refer to masteringphysics for the exact due dates. I strongly hold to the due date and time. There will absolutely be no make-up homework assignments, please plan your schedule accordingly.

### 3. **Dynamic Study-Modules**

There will be about 10 Dynamics Study-Modules to complete on MasteringPhysics throughout the semester. These are great tools to help you review the topics of the class. They are adaptive multiple-choice quizzes of about 25 questions which you can take as many times you need in order to master all concepts. They will be assigned roughly every week and due on Sundays at midnight. You are encouraged to complete these Modules sooner rather than later to help you prepare for homework and exams. Late submissions will not be accepted. **The lowest two scores will be dropped.**

4. **Midterm Exams:** There will be 3 midterms during the semester. More information on the exams will be provided during the semester.
5. **Final Exam:** There will be a comprehensive final exam at the end of the course. Your final exam score can replace your lowest midterm exam if the midterm score is lower than the final exam.
6. **Make-Up Exams:** No make-up exams will be given without **prior** permission. **Make-up exams** will only be offered in the following cases (a) absence due to a university sponsored activity or to military or jury duty, and (b) serious medical emergencies. In any case the student must provide complete documentation. In the case of exception (a) the request for a make-up exam must be filed with Professor Zollinger **at least three weeks in advance** of the anticipated absence. Please plan ahead accordingly.
7. **Extra Credit:** A small amount of extra credit is offered in the form of exam review assignments. This is a small amount, and you should not rely on it to make up for missed work. Please do not ask for extra credit to improve your grade, focus on getting the regular credit the first time.
8. **Canvas:** The Canvas online system will be used for all course announcements and posting of grades. Exam, quiz, and other grades will be available for viewing so that you can track your performance throughout the semester. Any other supplementary materials (including copies of the syllabus and schedule) will also be available in Canvas. I do my best to upload scores in a timely manner. You can also use the Canvas system to send me questions about homework or other aspects of the course.
9. **Class Attendance:** Attendance in the lectures is strongly recommended, however, it will not be recorded and is not considered part of your final grade. **Attendance to Discussion Sections is required and will contribute to your final course grade.** It is understood that there may be a few times that you will need to miss discussion section. To help with that, four discussion sections will be dropped. These are specifically offered to cover sickness and unexpected situations. Plan ahead accordingly.
10. **Late work:** Late work will only be accepted on the MasteringPhysics homework assignments. On those assignments, 20% will be deducted **per each day** the submission is late. You can submit problems individually on masteringphysics, so this applies only to problems submitted after the due date. Dynamic Study Modules on masteringphysics will not be accepted late.

Remember that the lowest two homework scores will be dropped (2 on masteringphysics, 2 of the handwritten assignments and 2 study modules). Also, 4 discussion sections can be missed without penalty. These assignments are dropped because I understand life doesn't always go as planned. However, you must still plan ahead. My advice is to only use the dropped assignments for unexpected sickness or emergencies. See above for the policy on make-up exams.

11. **Academic Integrity:** Cheating on any work will not be tolerated. This includes, but is not limited to, copying another's work, be it from another student, the Internet, or a solution manual. Extreme violations will result in automatic failure of the course. Scholastic dishonesty will be prosecuted to the fullest extent. Events of academic dishonesty will be dealt with in the following way:
  - First Offense: Student will receive a zero on exam or assignment.
  - Second Offense: Students will receive a failing grade in the course.

- Particularly egregious attempts at cheating will result in a referral to the advocacy system and a permanent mark on your record.

You are expected to have read and understood the Student Code for the University of Utah regarding student responsibilities and rights, and the intellectual property policy, for information about procedures and about what constitutes acceptable on-campus behavior. The student code can be found at: <https://regulations.utah.edu/academics/6-400.php>.

### **Additional Policies:**

#### The Americans with Disabilities Act:

The University of Utah seeks to provide equal access to its programs, services, and activities for people with disabilities. If you will need accommodations in this class, reasonable prior notice needs to be given to the Center for Disability Services, 162 Olpin Union Building, (801) 581--5020. CDS will work with you and the instructor to make arrangements for accommodations. All written information in this course can be made available in an alternative format with prior notification to the Center for Disability Services.

#### Addressing Sexual Misconduct:

Title IX makes it clear that violence and harassment based on sex and gender (which includes sexual orientation and gender identity/expression) is a civil rights offense subject to the same kinds of accountability and the same kinds of support applied to offenses against other protected categories such as race, national origin, color, religion, age, status as a person with a disability, veteran's status or genetic information. If you or someone you know has been harassed or assaulted, you are encouraged to report it to the Title IX Coordinator in the Office of Equal Opportunity and Affirmative Action, 135 Park Building, 801-- 581--8365, or the Office of the Dean of Students, 270 Union Building, 801--581--7066. For support and confidential consultation, contact the Center for Student Wellness, SSB 328, 801--581--7776. To report to the police, contact the Department of Public Safety, 801--585-- 2677(COPS).

#### Campus Safety

The University of Utah values the safety of all campus community members. To report suspicious activity or to request a courtesy escort, call campus police at 801-585-COPS (801-585-2677). You will receive important emergency alerts and safety messages regarding campus safety via text message. For more information regarding safety and to view available training resources, including helpful videos, visit [safeu.utah.edu](http://safeu.utah.edu).

#### Student Names and Personal Pronouns Statement

Canvas allows students to change the name that is displayed and allows them to add their pronouns to their Canvas name. I will honor you by referring to you with the name and pronoun that feels best for you. Please advise me of any name or pronoun changes (and update CIS and Canvas) so that I can help create a learning environment in which you, your name, and your pronoun will be respected. If you need assistance getting your preferred name on your uID card, please visit the LGBT Resource Center.