

# **Physics 0150/0140 – Fall 2025**

Department of Physics and Astronomy

School of Arts and Sciences

**University of Pennsylvania**

## **Course Overview for Principles of Physics I**

Classical Mechanics allows us to understand and predict the motion of an impressive range of objects including baseballs, planets, wheels, springs, swings, and violin strings. This calculus-based course is recommended for science majors and engineering students to provide a solid foundation in physics for future classes. Content includes classical laws of motion; interactions between particles; conservation laws for energy, momentum, and angular momentum; particle and rigid body motion; gravitation, and simple harmonic motion. This class also equips students with quantitative problem-solving skills and critical thinking skills. Students in PHYS 0150/0140 should already have taken MATH 1400 or equivalent or be taking MATH 1400 simultaneously with PHYS 0150.

## **Textbook**

The required textbook is volume 1 of **University Physics**

Authors: H. Young, R. Freedman.

Publisher : PEARSON

ISBN 13 : 9780135159552

The textbook is available in the Penn Bookstore. You are not required to purchase additional materials such as Mastering Physics. Note that the next class in the introductory calculus-based sequence (Physics 0151/0141) uses Volume 2 of University Physics. We will use the 15<sup>th</sup> edition, but the 14<sup>th</sup> and 13<sup>th</sup> editions are fine too. Inexpensive copies can be purchased online.

## **Canvas**

Announcements, assignments, solutions, and grades will be available on Canvas. You will have access to two different “course sites”, one for your “section” alone and one for all sections combined. All announcements of interest to all sections will be posted on the combined site. Students taking 0150 will also have access to a site for the undergraduate lab.

## Class Meeting Times

Each section requires attendance by registered students in that section. Class meeting times will be used for lectures and active learning.

Section 401 Professor Paul Angiolillo	MW	8:30-9:59 AM	F	8:30-9:29 AM
Section 402 Professor Gary Bernstein	TR	8:30-9:59 AM	W	8:30-9:29 AM
Section 403 Professor Elliot Lipeles	MW	12-1:29 PM	F	12-12:59 PM
Section 404 Professor Hayden Lee	TR	10:15-11:44 AM	W	10:15-11:14 AM
Section 405 Professor Evelyn Thomson	MW	10:15-11:44 AM	F	10:15-11:14 AM

30 minutes	Monday	Tuesday	Wednesday	Thursday	Friday
<b>8:30 AM</b>	401	402	401	402	401
<b>9:00 AM</b>	401	402	401	402	401
<b>9:30 AM</b>	401	402	401	402	
<b>10:15 AM</b>	405	404	405	404	405
<b>10:45 AM</b>	405	404	405	404	405
<b>11:15 AM</b>	405	404	405	404	
<b>12:00 PM</b>	403		403		403
<b>12:30 PM</b>	403		403		403
<b>1:00 PM</b>	403		403		

The extra time on Tuesdays at 5:15PM will be used during the semester for the two mid-term exams in 2025 on September 30 and October 28. The only dates when all students are required to be available for the Tuesday hour are the dates for the two midterms. This time may also be used for review sessions, make-up lectures or supplemental problem-solving sessions, so you should keep it as “open” as possible. We understand that some students have classes that conflict with this time, and that these students have had to request special permission to enroll with this time conflict. These students should rest assured that attendance in any additional lectures is optional.

## Office hours

Office hours are an opportunity for you to talk with us about your questions on concepts and/or specific problems from the homework assignments. Note that all office hours are open to all students in the class. Office hours will be posted on the combined site.

## Absences

Students may send absence notices through Path@Penn notifying their instructors when they need to miss class due to extenuating circumstances. Submitting an absence notice does not excuse students from their course obligations.

## Academic Integrity

All students in Physics 0140 and 0150 are expected to adhere to the University of Pennsylvania's [Code of Academic Integrity](#).

## Homework assignments

Students should complete all the assigned homework at a minimum to do well in this class. Each week, several sections of the textbook and about 10-15 questions will be assigned with a due date on Canvas. After the due date, worked solutions will be posted. Any material in the assigned homework may be covered in a quiz or on an exam.

## Grading

Midterm Exam 1	25%
Midterm Exam 2	25%
Final Exam	35%
Section-specific learning incentives	15%

To pass Physics 0150, you must complete all the labs and obtain a passing grade in the labs.

## Exams

There are two required midterms and one required final exam:

<b>Midterm 1</b>	<b>Tuesday September 30</b>	<b>5:15—6:15 PM (on Ch. 1 – 5)</b>
<b>Midterm 2</b>	<b>Tuesday October 28</b>	<b>5:15—6:15 PM (on Ch. 5 – 9)</b>
<b>Final Exam</b>	<b>Dec 11-18 final exam period</b>	<b>2 hours (cumulative, emphasis Ch. 10-14)</b>

Please inform your professor during the first week of the semester if you have a conflict with the midterm dates. **There will be no make-up exams for the midterms for any reason.** If you are ill or have a serious family emergency before the midterm, then please inform your professor before the midterm exam and submit an absence notice. In the event of an excused absence, the course grade will be based on the remaining exams. If you fail to take a mid-term exam and the absence is not excused, you will receive a score of zero for that exam.

The final exam date will be in the final exam period from December 11<sup>th</sup> to 18<sup>th</sup> 2025; the actual date will be announced as soon as it has been set by the registrar. Please don't make expensive non-refundable travel plans to leave campus before the end of the final exam period until the final exam date has been announced. **While there is a make-up exam in the official period in the first week of classes in January 2026 for the final exam**, you may take this make-up final exam only in case of an illness or serious family emergency that prevents you from taking the final exam, or if you have three final exams on the same calendar day *and* the Physics exam is the middle exam. You must inform your instructor **before** the final exam, and if your absence is excused, you must take the make-up final exam in the official period during the first week of classes in January 2026.

Exams will take place simultaneously for all sections in separate lecture halls. You will be assigned to a lecture hall based on your section and/or last name. Your assigned exam room will be announced on Canvas a few days prior to each exam. A formula sheet will be provided with the exam and will be posted in advance on Canvas. **During all exams and quizzes, the use of cell-phones – even just as calculators – is forbidden.** Bring an actual calculator with no communication or note storage capability! Although exams may emphasize more recent material, all exams are cumulative – they may have problems that require knowledge of all the course material covered up to that point in the exam.

Exam regrade requests must be submitted on a separate sheet of paper. **Do not write on the graded exam.** You must include your solution of the exam question and a brief explanation of your regrade request. Requests must be made within a week of the exams having been returned.

## Section-specific learning incentives

Each section may have its own way to help you learn and stay on track week-by-week. All sections will have a **reading assignment** associated with that week's homework assignment. Some sections may require you to complete **in-class active-learning worksheets** and/or **in-class quizzes** on the homework assignment. Each section's Canvas site will explain how these incentives contribute to that part of your grade.

- **Reading assignments** cover the textbook sections assigned in the homework assignments. These are short quizzes on Canvas each week to provide feedback and improve your understanding of the concepts.
- **Active Learning** involves working in-class in a small group to discuss and solve problems together on a worksheet. Discussion of the relevant concepts and

development of critical thinking skills of analysis and evaluation will be encouraged by your instructor and TAs as they circulate among the small groups.

- A completed worksheet for each group should be uploaded to Canvas at the end of each class.
- **Quizzes** are in class on dates that will be posted on the Canvas site for that section. Each quiz will be related to a specific homework assignment and will occur after the due date for that assignment.
  - There will typically be about 6 quizzes during the semester.
  - To encourage learning and decrease student stress levels, a resubmission policy specifically for quizzes has been developed. Students may submit an explanation for their mistake and their corrected work to receive up to half of the lost points back. The submission should be made on Canvas not more than two weeks after the date of the quiz.

## Labs for Physics 0150

**Labs begin the week of September XX in 2025.** The rooms in which the experiments will be performed change from week to week, please check the bulletin boards in the corridor on the third floor North and West corridors, these are located outside DRLB 3W5 and 3N18. The laboratory experiments are intended to supplement the lectures in the course by providing concrete demonstrations of the specific physical principals and by giving some insight into how those principles operate in practice. See the [Undergraduate Physics Lab](#) site and the Lab Canvas page for more information.

## Study Advice

Physics is best learned by trying to solve problems by working through them step by step. Forming a study group with a few other students in the class is highly recommended. If you're stumped, make a note of the question and ask about it at office hours.

One approach to getting the most out of both lectures and textbook is to take 15 minutes at the start of each week to skim through the assigned textbook chapter so you can see what to expect in class. It is recommended that you read through your lecture notes on the same day as the lecture and try some of the assigned homework problems. The lectures will cover the important points of the material and will work through detailed examples. The textbook provides additional worked examples and more information on each topic.

Just like learning to play a musical instrument or a sport, repeated practice is essential to build skills and to improve the long-term retention of those skills. Repeated practice will develop the critical thinking skills that you need to understand and solve problems on classical mechanics. During active learning sessions you will solve problems with your peers in a small group, and you are encouraged to study outside of class with a small group of your peers on the homework. You are welcome to attend the office hours of any professor teaching the class to find answers to your questions.

Warnings: Don't cram the night before a quiz/exam as then you're doubly missing out on both the gain from repeated practice and the opportunity to find answers to your questions at office hours. Don't try to learn physics by only reading the worked-out homework solutions as that is like trying to learn to play the violin by only reading about it! It won't lead to good grades when confronted with a blank sheet of paper for a quiz or an exam! Consult worked solutions for the homework only after you have tried the problems.

## Syllabus -2025

We cover about one chapter per week. We omit chapter 11 sections 4 and 5, and chapter 12.

Week		Topic	(University Physics)
1A	August 26*	1D Motion with constant acceleration	Chapter 2
2A	September 2*	2D Motion with constant acceleration	Chapter 3
3	September 8	Newton's Laws	Chapter 4
4	September 15	Applications of Newton's Laws	Chapter 5
5	September 22	Kinetic Energy, Work, Power	Chapter 6
6	September 29	Conservation of Energy	Chapter 7
7B	October 6	Conservation of Momentum, Impulse	Chapter 8
8	October 13	Rotational Motion	Chapter 9
9	October 20	Rotational Motion	Chapter 9
10	October 27	Torque	Chapter 10
11	November 3	Conservation of Angular Momentum	Chapter 10
12	November 10	Static Equilibrium	Chapter 11
13	November 17	Gravity	Chapter 13
14C	November 24	Simple Harmonic Motion	Chapter 14
15	December 1	Simple Harmonic Motion	Chapter 14
16D	December 8	Simple Harmonic Motion	Chapter 14

Notes	Sections 401,403,405	402,404
A = no Monday classes!	2.5 hours	4 hours
B = no Thurs/Fri classes (Fall Break)	3 hours	2.5 hours
C = Tues/Wed on Thurs/Fri schedule (Thanksgiving)	2.5 hours	1.5 hours
D = only Monday classes! (Last day of classes)	1.5 hours	0 hours

**Important dates:**

The first day of classes is Tuesday 26 August and the last day is Monday 8 December 2025.

Final exam period is December 11-18 2025.

Add period ends September 10.

Drop period ends October 6.

Withdraw period ends November 3.