

# Introduction to Physics for Science and Engineering I (Honors Physics 1) PHYS 0475, Fall 2023

**Instructor:** Dr. David Nero  
**Office:** 221B Allen Hall  
**Office Hours:** Wednesday 1–3pm, Friday 5:30–6:30pm  
Other times by appointment.  
**Office Phone:** (412) 624-7394  
**Email:** [djn23@pitt.edu](mailto:djn23@pitt.edu)  
  
**Class Website:** Canvas ([canvas.pitt.edu](https://canvas.pitt.edu))  
  
**Textbook:** *Physics, 5th edition* (Inclusive Access)

---

## Course Description

Physics 0475 is the first term of a two-term honors introductory lecture-demonstration sequence in physics primarily for students intending to major in a field of science or engineering. It is the honors version of Physics 0174. Familiarity with introductory calculus is essential. This course fulfills one Dietrich School of Arts and Sciences Natural Science General Education Requirement.

Topics covered in Physics 0475 include: kinematics, Newton's laws of motion, work, kinetic and potential energy, conservation of energy, linear momentum, conservation of linear momentum, rotational kinematics and dynamics, rigid body motion, conservation of angular momentum, gravitation, simple harmonic motion, waves, and special relativity. You will also learn how to write simple computer programs to solve numerical physics problems.

## Course Learning Objectives

- Demonstrate conceptual understanding of the concepts, principles and laws of physics covered in this course, as listed in the course description.
- Describe a physical situation, as necessary, using multiple representations such as written conceptual statements, mathematical equations, diagrams, and graphs, and be able to translate from one representation to another.
- Perform a conceptual analysis of a problem and identify physical principles required for its solution.
- Translate physical principles to formulate the mathematical statements required to solve a problem.
- Apply mathematical concepts and methods as necessary to analyze and solve problems.

## Requirements

1. **Phones and all other electronic devices must be silenced.** Laptops, tablets, phones, etc. are welcome to be used for note taking or other academic purposes. Watching videos, playing games, and/or browsing the Internet is not appropriate during lecture.
2. **Be courteous to your neighbors.** Carrying on a conversation, habitually coming in late or leaving early, or misusing technology (as detailed above), are all disruptive to the class. Students who fail to show common courtesy will be asked to leave the classroom.

## Policies

**Attendance:** You will get the most out of this class if you actively participate. To that end, there will be graded assignments that require you to be present in class. I realize that some absences are unavoidable, so I will drop your six lowest days of regular in-class work, no questions asked. You will need to provide documentation of excusable absences for more than six days to be dropped. There is no penalty for missing class beyond a zero grade on the assignments missed.

**Electronic Communication:** Students are expected to regularly check their pitt.edu email and to regularly sign on to Canvas. Failure to read and react to University communications in a timely manner does not absolve the student from knowing and complying with the content of communications.

**Statement on Classroom Recording:** Lectures will be recorded for students to view later. Students may not distribute these recordings to anyone outside of the class, nor may they create their own recordings of the lectures, discussion, and/or activities without the advance written permission of the instructor, and any such recording properly approved in advance can be used solely for the student's own private use.

**Academic Integrity:** Students in this course will be expected to comply with the [University of Pittsburgh's Policy on Academic Integrity](#). Any student suspected of violating this obligation for any reason during the semester will be required to participate in the procedural process, initiated at the instructor level, as outlined in the University Guidelines on Academic Integrity. This may include, but is not limited to, the confiscation of the examination of any individual suspected of violating University Policy. Furthermore, no student may bring any unauthorized materials to an exam, including dictionaries and programmable calculators.

To learn more about Academic Integrity, visit the [Academic Integrity Guide](#) for an overview of the topic. For hands-on practice, complete the [Academic Integrity Modules](#).

**Disability Services:** If you have a disability for which you are or may be requesting an accommodation, you are encouraged to contact both your instructor and [Disability Resources and Services](#) (DRS), 140 William Pitt Union, (412) 648-7890, [drsrecep@pitt.edu](mailto:drsrecep@pitt.edu), (412) 228-5347 for P3 ASL users, as early as possible in the term. DRS will verify your disability and determine reasonable accommodations for this course.

**Title IX:** As your professor, I am required to report any incidents of sexual misconduct that are directly reported to me. You can also report directly to Office of Civil Rights and Title IX: 412-648-7860 (8:30am–5pm M–F) or via the Pitt Concern Connection at: [Make A Report](#)

If you wish to make a confidential report, Pitt encourages you to reach out to these resources:

- The University Counseling Center: 412-648-7930 (8:30am to 5pm M–F) and 412-648-7856 (after business hours)
- Pittsburgh Action Against Rape: 1-866-363-7273 (24/7)

If you have an immediate safety concern, please contact the University of Pittsburgh Police: 412-624-2121

## Grade Scale

Grades may be curved up a percentage point or two, depending on average checkpoint and final exam scores. Grades will never be curved down. It is possible for everyone to earn an A, although grades of A+ are limited to the top few students. If you achieve the following final grade percentages in the course, you will receive at least:

Percentage	Minimum Grade
90%	A-
80%	B-
70%	C
65%	C-
55%	D-

## Grading

Assignment	%	Notes
In-Class Questions	10%	lowest 6 dropped
Homework	20%	
Checkpoints	55%	
Final Exam	15%	

### In-Class Questions

During most classes, there will be several questions posed for you to answer using Top Hat. You can access Top Hat through Canvas or using their mobile app. In my opinion, the app is nicer. The University is already paying for Top Hat, so you don't need to pay anything extra. Grading will be 80% credit for participation, and 20% credit for correctness. As detailed under "Attendance" above, your lowest six days are dropped.

### Homework

Homework will be posted weekly, and is due at the start of the Thursday recitation. You will hand a paper copy to your TA. Assignments may only be submitted by email with the TA's permission. Grading is based on completion (work shown) rather than correctness. A penalty of 20% per day will be applied to late homework.

### Checkpoints

In place of exams, the bulk of your grade will come from 11 checkpoints. Each will consist of four related questions from the previous week's unit, with each question probing a different type of learning objective:

1. Retrieval. Examples: definitions, plug and chug problems, core concepts
2. Comprehension. Examples: graphs, sketches, conceptual problems, limiting cases
3. Analysis. Examples: multi-step problems, making predictions, identifying different cases
4. Knowledge Utilization. Examples: problems with multiple concepts, problems that require making assumptions, explaining conclusions

Your grade is based on the number of questions that are correct:

Number of Questions Correct	Score
0	0%
1	50%
2	70%
3	90%
4	100%

There is no per-question partial credit. Instead, each unit's checkpoint may be attempted two or three times (with new questions). The second attempt is offered one week after the first. Third attempts are offered during the last week of the class. You keep the highest score.

Stand-alone calculators are permitted (no apps), but only for calculations—not as a place to store information. Students may not share any materials, including calculators.

**Missed Checkpoints** Checkpoints can be made up in cases of documented emergency (medical or personal), or if arrangements are made in advance (for sports, etc.). Otherwise, unexcused absences reduce the number of the attempts available to you.

## **Final Exam**

A cumulative final exam will be held during finals week (at the time chosen by the registrar), and will be in a traditional multiple-choice format. You may bring one page of notes (front and back). Stand-alone calculators are permitted (no apps), but only for calculations—not as a place to store information. Students may not share any materials, including calculators and note sheets.

## **Recitation**

Recitations will meet on Tuesday and Thursday. Tuesday recitation will be used for question-and-answer and example problems. Homework is due at the start of the Thursday recitation. Checkpoints will be administered during the Thursday recitation after collecting homework. You will have time to complete two checkpoints per recitation (or you can leave early if you're already happy with your grade).

## **Extra Credit Opportunities**

### **Surveys (+0.5%)**

At the beginning and end of the semester, short surveys will be administered on behalf of the Physics department. The results of these surveys are used to help us improve Physics education.

### **Feedback Groups (+0.5%)**

Student feedback is important to me, so I would like to meet with small groups of students for this purpose. A feedback group will consist of six students, and will meet with me for 30 minutes. I will announce how to sign up in class. Groups will be filled on a first come, first served basis.