

# Basic Physics for Science and Engineering I

## PHYS 0174, Fall 2022

<b>Instructor:</b>	Dr. David Nero
<b>Office:</b>	221B Allen Hall
<b>Office Hours:</b>	Wednesday 12:30pm–2pm, Friday 11am–12:30pm, or by appointment
<b>Office Phone:</b>	(412) 624-7394
<b>Email:</b>	<a href="mailto:djn23@pitt.edu">djn23@pitt.edu</a>
<b>Class Website:</b>	Canvas ( <a href="https://canvas.pitt.edu">canvas.pitt.edu</a> )
<b>Textbook:</b>	<i>Fundamentals of Physics, 12th edition</i> by Halliday, Resnick, and Walker (other recent editions are fine)
<b>Homework:</b>	Achieve (linked to from Canvas) Cost is \$38 for one semester or \$60 for two.

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## Course Description

Physics 0174 is the first term of a two-term calculus-based introductory lecture-demonstration sequence in physics primarily for students intending to major in a field of science or engineering. Calculus is used as needed, and should be taken at least concurrently. This course fulfills one Dietrich School of Arts and Sciences Natural Science General Education Requirement

Topics covered in Physics 0174 include: kinematics, Newton's laws of motion, work, kinetic and potential energy, conservation of energy, linear momentum, conservation of angular momentum, rotational kinematics and dynamics, rigid body motion, conservation of angular momentum, gravitation, simple harmonic motion, and waves.

Credit will not be given for both the Physics 0174/0175 sequence and the Physics 0110/0111 sequence. Students intending to major in physics are recommended to take Physics 0475/0476, the honors introductory sequence. The laboratory course associated with Physics 0174/0175, Physics 0219, should be taken *after* Physics 0174.

## 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 such as algebra, differentiation, integration, trigonometry, and vector analysis as necessary to analyze and solve problems.

## Requirements

1. **Cell phones and all other electronic devices must be silenced.** In addition, students are expected to refrain from excessive electronic communication during class. Laptops, tablets, and smart phones may be used for note taking or reference 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.
3. **Heath regulations.** For the most up-to-date information and guidance, please visit [coronavirus.pitt.edu](https://coronavirus.pitt.edu) and check Canvas and your Pitt email for updates before each class. If you are required to isolate or quarantine, become sick, or are unable to come to class, contact me as soon as possible to discuss arrangements.

## 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 four lowest days (two weeks worth of class), no questions asked. You will need to provide documentation of excusable absences for more than four days to be dropped. There is no penalty for missing class beyond a zero grade on the assignments missed.

**Missed Assignments/Exams:** The only assignment that I will accept late is homework, at a 20% penalty per day. If you are aware of an impending conflict with the scheduled time of an exam or other assignment, you should let me know as early in the semester as possible. In these cases, accommodations will be provided as long as the circumstances are reasonable and you can provide appropriate documentation. In cases where prior arrangements have not been made, missed exams can only be made up after the fact in cases of documented emergency, and **only if you contact me within 48 hours of the missed exam**. Otherwise, missed assignments and exams earn a zero grade.

**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.

**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.

**Examples of violations that I've seen and prosecuted include collaborating with another person during an examination (unless explicitly allowed), looking up answers to a graded assignment online (using Chegg or any other website), and submitting another person's work as their own.**

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

**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.

**Statement on Classroom Recording:** Lectures will be recorded for students to view later. These recordings will only be available to students registered for the class. 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.

**Title IX:**

“No person in the United States shall, on the basis of sex, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any education program or activity receiving Federal financial assistance.”

As a professor I am a mandatory reporter, and I am required to report violations of Title IX that I observe or am made aware of to the **Title IX office**. Title IX violations include, but are not limited to, sexual harassment, sexual violence and verbal or sexual abuse. Within the classroom, behavior in violation might appear as: suggestive jokes or innuendos, inappropriate touching, and unwanted sexual behavior or advances, but **my capacity and obligation to report does not end at the classroom**.

## Grade Scale

Grades may be curved up a percentage point or two, depending on average exam scores. Grades will never be curved down. 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-

Only the top few students will earn an A+. Although the final curve will not be fixed until the end of the course, an estimate of your letter grade will be maintained on Canvas.

## Grading

Assignment	%	Notes
In-Class Questions	10%	lowest 4 dropped
Homework	10%	
Concept Quizzes	10%	lowest 2 dropped
Recitation Quizzes	10%	
Midterm Exams	40%	
Final Exam	20%	

### In-Class Questions

Starting the first full week of class, there will be several questions posed during each class 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 four scores are dropped.

## Homework

Homework will be posted on the online homework system, Achieve. You will be prompted to create an account when you first access the homework. The cost is \$38 for one semester or \$60 for two. Unlike other assignments, homework may be completed late for reduced credit (20% penalty per day).

## Concept Quizzes

In addition to homework problems, Achieve will be used to administer short concept quizzes. The purpose of these quizzes is twofold: 1) They will verify that you are keeping up with the lecture videos. 2) They will provide immediate feedback that I will use to adjust the content of the class. You may treat these quizzes as open book/notes. That said, they are not meant to be difficult—in my opinion, the questions are easier than what I will put on the exams (homework and textbook questions are a much better gauge of exam difficulty). Be mindful of the posted deadlines. Late concept quizzes are not accepted, but your two lowest scores are dropped.

## Recitation Quizzes

At the end of most recitations, a short multiple-choice quiz will be administered, with the purpose of providing frequent feedback of your understanding. These quizzes will be open book/notes, and may be completed in groups. If you find that you are frequently relying on group members during these quizzes, you will likely have significant trouble with the exams. Make sure to correct that situation before exam time!

## Midterm Exams

There will be three midterm exams and a cumulative final exam. Each of the midterm exams will be all short-calculation questions. The final exam will be all multiple choice. All exams are closed book/notes, but students may prepare a double-sided page of notes for reference. Stand-alone calculators are permitted (no cell phones), but only for calculations—not as a place to store information. Students may not share any materials during exams, including calculators and note sheets.

## Extra Credit Opportunities

### Cubits Question and Answer (+2%)

We will be using [cubits.ai](#) for pre-class lecture videos along with question-and-answer. I will use these comments to adjust the content of the class. You will be able to see the comments that your classmates have made, and you are especially encouraged to reply to those comments. As an incentive, I will award extra credit to any student who posts a question or answer 20 times over the course of the semester (a little less than one per lecture). Those who spam low-content posts to inflate their total diminish the utility of online discussion, and so will be disqualified from earning this extra credit.

### Surveys (+0.5%)

At the beginning and end of the semester, short surveys will be administered on behalf of the Physics department. This credit will be pro-rated based on the number of surveys you complete (so if you complete half of the surveys, you get half credit).

### UTA Visit (+0.5%)

Undergraduate Teaching Assistants (UTAs) are fellow undergraduates who recently completed this course and earned a top grade. They are an excellent resource for homework assistance. As an added incentive, any student who visits a UTAs for this class **twice** will receive 0.5% extra credit. Make sure you tell the UTA your name, since they will be keeping track of attendance for this purpose.