

Basic Physics for Science and Engineering I

PHYS 0174, Fall 2020

Instructor: Dr. David Nero
Office: 221B Allen Hall (or my basement)
Office Hours: Wednesdays 2:30-5:30pm; other times by appointment
Office Phone: (412) 624-7394
Email: djn23@pitt.edu

Class Website: Canvas (canvas.pitt.edu)

Textbook: *Fundamentals of Physics, 11th edition*
by Halliday, Resnick, and Walker (other recent editions are fine)

Homework: Sapling Learning (linked to from Canvas)
Cost is \$38.

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.

Flex@Pitt

Our assigned classroom is the Carnegie Music Hall auditorium. This room normally seats 1900, so we could all fit in there at the same time if we wanted to. BUT, we can only use that classroom if Pitt is in the “guarded” posture. As of the time of writing, we are not, so everything is initially online only. If we do move to “guarded” it will be up to each individual whether or not they want to come to the classroom on any given day (I will also need to make that choice). Regardless of what happens, there will be an online option for the class. In fact, given the issues with teaching in a giant room while everyone is masked, even in a face-to-face class we’ll need to lean heavily on the online tools.

Policies

Attendance: You will get the most out of the class if you can participate synchronously, regardless of whether that be face-to-face or online. To that end, there will be graded assignments that require your active participation. If circumstances require you to permanently take the class asynchronously, you are required to let me know so that alternatives to these assignments can be arranged. To be clear, there needs to be a good reason for taking the class asynchronously, like living in a distant time zone. Students may contact me to temporarily convert to asynchronous status in emergency situations (like falling ill with covid-19).

Missed Assignments/Exams: By default, missed assignments (including exams) earn a zero grade. The one exception is that homework will be accepted late at a 20% penalty per day.

If you are aware of an impending conflict with the scheduled time of an exam or other in-class 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 in cases of documented emergency, and **only if you contact me within 48 hours of the missed exam.**

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. Furthermore, no student may bring any unauthorized materials to an exam, including dictionaries and programmable calculators.

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, (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 dropped
Homework	10%	
Concept Quizzes	10%	lowest 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. Your lowest score is dropped.

Homework

Homework will be posted on the online homework system Sapling Learning. You will be prompted to create an account when you first access the homework. The cost is \$38, but you will have the option to begin a free trial for the first two weeks of the course. Unlike other assignments, homework may be completed late for reduced credit (20% penalty per day).

Concept Quizzes

In addition to homework problems, Sapling Learning 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 assigned reading and 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). Visit Sapling Learning for a list of specific due dates. Late concept quizzes are not accepted, but your lowest score is dropped.

Recitation Quizzes

Most recitation will feature a practice exam problem that you will complete in groups (the same groups will be used for the group portion of the exams). Each group submits one copy of the problem for grading. If you find that your group is not working well together, your TA can intervene. For more serious issues, you may request to be moved to a different group. Make sure that your group learns how to work well together before exam time!

Midterm Exams

There will be two midterm exams. Each exam will be composed of two equally-weighted parts. First, there will be a group portion of the exam completed during class time on Monday. Each group will submit a single copy of the exam for grading.

- Even though only one version of the exam is to be graded, everyone in the group must fill out and keep a copy of the exam. I reserve the right to collect this individual copy for verification at any time before the course is concluded.
- During this portion of the exam, you may use your book and notes.
- Attempting to find solutions online, or collaborating with any person outside of your group will be considered a breach of the academic integrity code. Be aware that I know about websites like Chegg, and will be checking for solutions copied from another source.
- If you suspect cheating in your group, it is your responsibility to alert a proctor. You can do this discretely by sending an email. Otherwise, the entire group is liable if caught.
- If an issue arises with your group during the exam (say someone isn't participating), you may call for a proctor to intervene. At the proctor's discretion, your group may instead submit individual copies of the exam for grading.

The second part of the exam will be completed individually in class on Friday. Each person will receive a set of conceptual followup questions that are based on the group portion of the exam. The purpose of these questions is to gauge how well each group member understood the topics being tested.

- During this portion of the exam, you may use your book and notes. You may also use your copy of the group exam.
- Attempting to find solutions online, or collaborating with any other person (even your group members) will be considered a breach of the academic integrity code.

Final Exam

If conditions allow, the final exam will be held in a classroom and be multiple choice (with an online option for students who are unable or unwilling to come to campus). If that is not practical, then the final exam will be conducting in the same format as the midterms. In either case, the final exam will be cumulative. Additional details regarding the specific policies governing the final exam will be posted later in the term, and are subject to the University administration's requirements.

Extra Credit Opportunities

Other opportunities for extra credit may be announced during the semester. **The total extra credit that may be earned is capped at +3%.**

Piazza Question and Answer (+1%)

We will be using Piazza for online 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 +1% extra credit to any student who posts a question or answer 20 times over the course of the semester. 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.

CourseMIRROR (+1%)

This semester, we are using a new digital tool that is being developed here at Pitt. It is called CourseMIRROR, and it collects data from student reflections to help instructors identify difficulties that students encounter and provide additional feedback and support for student learning throughout the semester. Like concept quizzes, your responses will help me to customize the content of the class. Please be sure to submit your reflections after each lecture using CourseMIRROR. Students who participate at least 80% of the time will receive an additional 1% extra credit added to their final grade. Instructions detailing how to download and use CourseMirror will be posted on Canvas.

Surveys (+0.5%)

At the beginning and end of the semester, multiple choice surveys will be administered during recitation as a means to gauge the class's progress, and to compare the degree that learning objectives are reached as compared to other physics sections—both at Pitt, and at other institutions. Let me stress that the results of these surveys will not be used to determine your grade, although an honest attempt is required to earn the extra credit. 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 recent completed this course and earned a top grade. They are an excellent resource for homework assistance. As an added incentive, any student who visits one or more of the UTAs for this class **twice** will received 0.5% extra credit. Make sure you tell the UTA your name, since they will be keeping track of attendance for this purpose.