

Basic Physics for Science and Engineering I

PHYS 0174 (Section 1150), Fall 2014

Instructor: Dr. David Nero
Office: 221B Allen Hall
Office Hours: Wednesday 4:00–5:00pm, Friday 5:30–6:30pm, or by appointment
Phone: (412) 624-7394
Email: djn23@pitt.edu

Class Room: 343 Alumni Hall
Class Times: Monday and Friday 3:00–3:50pm
Class Website: CourseWeb (courseweb.pitt.edu)

Textbook: *Fundamentals of Physics, Custom edition* (based on 9th edition)
by Halliday, Resnick, and Walker
(Other recent editions are also usable.)

Homework: WileyPLUS (accessed through the class website)
Access code is required. Codes come bundled with the textbook at the bookstore,
or can be purchased when first accessing the homework.

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.

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, simple harmonic motion, waves, and the thermodynamics of ideal gases.

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.

This section will be held in a flipped format. Students will be expected to watch approximately two hours of recorded lectures each week on CourseWeb. The other two hours each week will be spent in the classroom with a focus on demonstrations and problem solving.

Course Learning Objectives

- Students will utilize the relationships between force, energy, and momentum to understand a wide range of physical systems.
- Students will develop a working understanding of waves and thermal processes.
- Students will use physical insight to quickly estimate and make predictions of the behavior of physical systems.
- Students will demonstrate quantitative problem solving skills.

Requirements

1. **Cell phones and all other electronic devices must be silenced.** In addition, students are expected to refrain from excessive texting 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.

Policies

Attendance Policy: Attendance will be recorded, but not graded.

Missed Assignments/Exams: By default, missed assignments (including exams) earn a zero grade. 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 in cases of **documented emergency**, and only if you contact me within **48 hours** of the missed exam.

Academic Integrity: All students are expected to adhere to the standards of academic honesty. Any student engaged in cheating, plagiarism, or other acts of academic dishonesty will be subject to disciplinary action. Any student suspected of violating this obligation for any reason during the semester will be subject to the process outlined in the University Guidelines on Academic Integrity (<http://www.as.pitt.edu/fac/policies/academic-integrity>).

Disability Services: If you have a disability that requires special testing accommodations or other classroom modifications, you need to notify both the instructor and Disability Resources and Services no later than the second week of the term. You may be asked to provide documentation of your disability to determine the appropriateness of accommodations. To notify Disability Resources and Services, call (412) 648-7890 (Voice or TTD) to schedule an appointment. The Disability Resources and Services office is located in 140 William Pitt Union on the Oakland campus.

Statement on Classroom Recording: To ensure the free and open discussion of ideas, students may not record classroom 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.

Grade Scale

In order to keep grading consistent between different sections and instructors, the grading scale will be adjusted to remain consistent with departmental guidelines. That said, 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-
60%	D-

Grade bins will not necessarily remain the same size as each other. Regardless of the scale, only the top few students will have the potential to earn an A+. At the other extreme, no score below 50% will pass. Although the final grade bins will not be fixed until the end of the course, an estimate of your letter grade will be maintained on CourseWeb, with updates occurring after each exam.

Grading

Assignment	%	Points
14 Homework	14%	140 (10 ea.)
14 Concept Quizzes	14%	140 (10 ea.)
12 In-Class Exercises	12%	120 (10 ea.)
3 Midterm Exams	36%	360 (120 ea.)
1 Final Exam	24%	240
Total:	100%	1000

Think Pair Share Questions (ungraded)

Several times during each class, I will pose Think Pair Share (TPS) questions. TPSs are multiple-choice questions that will be answered by pressing a key on a hand-held radio transmitter or “clicker.” You are encouraged to discuss your answer with your neighbor while answering. TPSs are not graded, however, your participation will be used to record attendance.

Clickers: The lecture hall is equipped with set of clickers for student use. At the beginning of each class, you are to pick up your assigned clicker from the bins at the front of the room. Likewise, you are to return your clicker to the bins at the end of class, since other students in other classes will use the same clicker. Under no circumstances are you to remove the clicker from the classroom or to take a clicker other than the one assigned to you. If your clicker is missing (and you’ve verified that it was not simply placed in the wrong bin), then you need to let me know before you leave. Clickers will be checked after each class, and students will be held responsible if their assigned clicker has gone missing.

Homework

Homework will be posted on the online homework system WileyPLUS, accessible from CourseWeb. You will be prompted for an access code the first time that you access the homework. New textbooks are bundled with a code, or you may buy one directly from WileyPLUS when first accessing the homework.

As noted in the attached schedule, homework will be due on Sundays at 11:59pm. As long as you haven’t already viewed the solutions, you may request a 48 hour extension via email at a 20% penalty. Homework later than 48 hours will not be accepted. See the attached schedule for a list of chapters covered each week.

Concept Quizzes

In addition to homework problems, WileyPLUS will be used to administer short concept quizzes. The purpose of these quizzes is twofold: 1) They will verify that students 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 questions are a much better gauge of exam difficulty). Concept quizzes are to be completed by 11:59pm on the day **before** class. See CourseWeb for a list of specific due dates.

In-Class Exercises

During some lectures, there will be a graded In-Class Exercise (ICE). An ICE is a question that I pose for the class to answer in roughly one hand-written page. Depending on the specifics of the problem, your group will be asked to explain the physics involved and/or to make a rough calculation of a particular quantity. Explanations should be in paragraph form. Students will work in teams of up to 4 students. Each group submits a single written answer.

ICE Grading: ICEs are out of 10 possible points. A well reasoned and complete answer, showing insight into physics, earns the full 10 points. Scores of 8 or 9 are respectable, but indicate that the answer is either a bit incomplete, or that there is some minor misunderstanding. Scores of 7 and below indicate that either the answer is very incomplete, or that there is a serious misunderstanding. Be sure to correct this misunderstanding before exam time.

Recitations

You are expected to attend a weekly recitation with one of our teaching assistants. Recitation will consist of a mix of question-and-answer, discussion of recent ICEs, additional example problems, and optional extra credit survey questions to gauge the class's progress (see below).

Exams

There will be three midterm exams, each covering four to six chapters, and a cumulative final exam. Each of the exams will be 40% multiple-choice and 60% short-calculation questions. Partial credit will be available on the short calculation problems. 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 erasers. Study guides will be posted on Courseweb to give you an idea of what I consider to be important topics.

Extra Credit Opportunities

You can potentially earn up to 80 points (8%) extra credit in this class. Additional extra credit opportunities may be announced during the semester.

Extra Credit	Points
Student Feedback	10
Surveys	20 (2.5 ea.)
Exploration Center Lab Reports	capped at 50 (10 ea.)

Student Feedback

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 at one of the times posted on CourseWeb in exchange for 10 extra credit points. If you wish to apply for one of these groups, sign up on CourseWeb. Groups will be filled on a first come, first served basis, so sign up soon (these fill up very quickly!).

Surveys

Surveys will be administered in class and in 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. (In fact, the creators of the surveys often forbid me from telling you your “score.”) That said, I realize that completing a survey is a burden, so I will compensate you with up to 20 extra credit points for completing these surveys.

Exploration Center Lab Reports

A schedule will be posted on CourseWeb of times when you can go to the *Physics Exploration Center* in Thaw Hall 312 to complete one of the optional experiments there. Completed reports should be returned to the teaching assistant at your recitation section by the posted due dates. Regardless of how many reports you complete, the maximum extra credit from this option is capped at 50 points. See the description on CourseWeb for formatting guidelines.

Helpful Resources

- If you encounter difficulty in this course, the best thing to do is to visit either me or one of our teaching assistants at their office hours as early in the semester as possible (see CourseWeb for an up-to-date list of office hours). Sadly, we won't be able to help much if you wait until the end of the semester before seeking help.
- The department of Physics and Astronomy maintains the free *Physics Resource Room* in Thaw Hall 312. It is staffed with physics graduate students who can help you with any topic covered in this course. This is an ideal resource to help you with the trickier homework problems (as are office hours). Hours are 9am–4pm. No appointment is needed.
- The *Academic Resource Center* in G1 Gardner Steel Conference Center (next to Thackeray Hall) offers free hour long tutoring sessions for any student in this course. Hours are 9am–4pm. If interested, please call 412-648-7920 to make an appointment.

Schedule

Updates to the schedule will be posted on CourseWeb.

	Monday	Friday	Homework Due (11:59pm Sunday)
	25 Intro Ch 1	29 Ch 3	31 Ch 3
S E P T	1 No Classes	5 Ch 2	7 Ch 2
	8 Ch 4	12 Ch 4 Ch 5	14 Ch 4
	15 Ch 5	19 Ch 5 Ch 6	21 Ch 5
	22 Ch 6	26 Exam 2–6	28 Ch 6
	29 Ch 7	3 Ch 7 Ch 8	5 Ch 7
O C T	6 Ch 8	10 Ch 9	12 Ch 8
	14 (Monday Makeup) Ch 9	17 Ch 10	19 Ch 9
	20 Ch 10 Ch 11	24 Ch 11	26 Ch 10
	27 Exam 7–11	31 Ch 12	2 Ch 11
N O V	3 Ch 15	7 Ch 15 Waves (16–17)	9 Ch 12
	10 Waves (16–17)	14 Waves (16–17)	16 Ch 15
	17 Exam 12, 15, Waves	21 Thermo (18–20)	23 Waves
	24 Thermo (18–20)	28 No Classes	30
	1 Thermo (18–20)	5 Review	7 Thermo
Final Exam (cumulative): Monday December 8, 2:00–3:50pm			