PHYS 0110: Introduction to Physics I

Fall 2018

CRN: 10303

Lectures: Tuesday/Thursday: 6:00pm-7:20pm, 343 Alumni Hall

Instructor:
Brian Pardo
Email: bap100@pitt.edu
Office: OEH 109A, office hours in Allen 319

TAs:
Troy Raen: troy.raen@pitt.edu
Shu Liu: shl109@pitt.edu

Discussion Sections:
31199 - Tu 5:00pm - 5:50pm, 130 Cathedral of Learning (Shu)
25517 - Tu 5:00pm - 5:50pm, 343 Alumni Hall (Troy)
10304 - Tu 7:30pm - 8:15pm, 343 Alumni Hall (Troy)
25517 - Th 5:00pm - 5:50pm, 343 Alumni Hall (Troy)
31011 - Th 7:30pm - 8:15pm, 343 Alumni Hall (Troy)

Problem-Solving Sessions/Office Hours:
Brian: TBD or by appointment
Troy: TBD

Prerequisites:
MATH 0020 or any MATH greater than or equal to MATH 0031 or SAT Math Score (620 or greater) or ACT Math Score (27 or greater)

This is the first term in a two-term lecture-demonstration sequence that presents the elements of both classical and modern physics. This course is appropriate for non-science majors, and for those majoring in the social, psychological and life sciences that do not need the more mathematically oriented course required of engineering and physical science students (Physics 0174, 0175).

MATERIALS:

We will make use of the reference text *College Physics* from OpenStax (available for free online, or for a low cost in print). You can find it at https://www.openstax.org/details/college-physics. Do not be surprised, however, if lectures deviate from the order of presentation or material is presented in a slightly different way.

You will need a scientific calculator capable of computing basic trigonometric, exponential and logarithmic functions, and will be assigned a clicker for use during class.

WHAT THIS COURSE IS ABOUT:

"The whole of science is nothing more than a refinement of everyday thinking." - Albert Einstein, 1936

This course is fundamentally about forces and motion. Fortunately for us, this is actually something you know an awful lot about already. You generally know what is going to happen when we push and pull

things, when objects collide, etc. This is common sense, or everyday thinking as Einstein points out, and is the starting point to describing the world in terms of physical laws.

If this were all there was to it, you would not be here to take this class. Physics is the science of taking this intuition and testing it, deconstructing it into physical laws through the use of mathematics. More importantly we look for where our intuition fails us, and try to understand how or why. This is where things get interesting!

LEARNING OBJECTIVES OF THIS COURSE:

By the end of this course, you should be able demonstrate an understanding of the concepts, principles and physical laws we cover in class. I will expect you to take these concepts and apply them to solve problems or explain physical situations for which those concepts are applicable. Specific learning objectives for each topic covered in this course can be found on Courseweb.

A side note about mathematics: mathematics is the language of physics, and we will not shy away from using it to describe the physical world in this class. However, there is a danger in thinking of physics as just memorizing formulas and how to use them. We will use math, but you will be expected to employ it as a tool in your reasoning and in expressing your ideas about physical problems. You will use it to confirm your intuition and convey your ideas.

BEFORE EACH CLASS:

You will be expected to read the corresponding sections of *College Physics* and take a short reading quiz before each class. Having familiarity with the material before class begins allows more time for discussion, demonstrations, and problem solving and transforms you into an active learner of the material. By reading beforehand, you build a framework with which to understand the demonstrations and physical problems which we explore during lecture, and enables and empowers to you to engage in the discussions of the concepts in class.

HOMEWORK:

There will weekly homework assignments, typically due every Tuesday. There will be two components of each homework assignment. The first will be an online assignment; the specifics of how to complete these will be discussed during the first class.

The second component will be several longer problems that will require a written solution. These are intended to be completed AFTER the online assignment, and will use the concepts developed and tested there. They will typically be more in-depth and will help to develop your skills in communicating your thinking in how you arrive at a solution. If you get stuck on the homeworks, you are strongly encouraged to talk with other students or your TAs *as long as your solution is your own.*

OTHER RESOURCES:

The following help resources are available:

- TA or my office hours (see times above or on CourseWeb). No appointment is needed.
- The Physics Help Room in the Department of Physics and Astronomy (304 Old Engineering Hall, MonFri 9am-4pm), staffed by graduate TAs. No appointment is needed.
- The Academic Resource Center at the Gardner Steel Center Building, with entrance on Thackeray Street. There, Mon-Fri 9am-4pm undergraduate tutors will be able to help you with problems. An appointment is needed, because these tutors only give one-on-one help.

ABSENCES AND EXCUSES:

If you have a valid excuse for missing a homework assignment or exam, see me to arrange what to do about it beforehand if at all possible. Valid excuses, as you probably know, are illnesses, jury duty, emergencies. Vacations or travel are NOT valid excuses. When it doubt, Ill ask your dean if it is valid. You must see me, not your TA.

In general, I will not give makeup exams. If you require accomodations, you must contact me well in advance. In cases of emergencies, medical or otherwise, you must contact me as soon as possible, and provide documentation.

ELECTRONICS POLICY:

Cell phones and other electronic devices must be turned off or placed in silent mode during class, with the exception of those used for taking notes during class. Frivolous use of electronics during class is distracting to other students and hinders the learning environment. Violations of this policy will be dealt with accordingly.

GRADES:

There are three grading categories. I do not grade on a curve; instead, your course grade will be based on your demonstrated mastery of the learning objectives. It will consist of:

Recitations/In-class Activities/Quizzes - 25%

These are designed to be easy points and will consist of discussion section grades (10%), reading quizzes (10%), and clicker questions/attendance (5%). Essentially, you'll do well here if you show you are putting in the effort to learn physics.

Homework - 15%

There will be two assignments a week consisting of short answer problems, posted one week in advance of their due date. Full credit will be given for well-reasoned, neat, correct solutions. You will get partial credit for a well-argued but incorrect solution, and no points for answers with no reasoning, correct or not. Late homework will NOT be accepted.

Exams - 60%

Exams are your opportunity to demonstrate your understanding of the material. Memorizing equations is not the goal here, but rather a deeper understanding of the physical concepts we will be discussing. There will be 3 midterm exams and one cumulative final exam which will be weighted equally (15% each). Each will consist of multiple choice questions followed by 2-4 short answer problems (each with several parts).

TENTATIVE SCHEDULE:

The semester is broken into 13 modules (M), each covering a major learning objective of the course.

Week	Tues	Thurs
1	August 28 (M1)	August 30 (M1)
2	September 4 (M1)	September 6 (M2)
3	September 11 (M2)	September 13 (M3)
4	September 18 (M3)	September 20 (M4)
5	September 25 (M4)	September 27 (Exam 1)
6	October 2 (M5)	October 4 (M5)
7	October 9 (M6)	October 11 (M6)
8	X	October 18 (M7)
9	October 23 (M7)	October 25 (Exam 2)
10	October 30 (M8)	November 1 (M8)
11	November 6 (M9)	November 8 (M9)
12	November 13 (M10)	November 15 (M10)
13	November 20 (Exam 3)	X
14	November 27 (M11)	November 29 (M11)
15	December 4 (M12)	December 6 (M12/M13)
16	December 11 (M13)	December 13 (Final 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 would be subject to disciplinary action. 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 http://www.pitt.edu/~provost/ail.html. This may include, but is not limited to the confiscation of the examination of any individual suspected of violating the University Policy.

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:

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 students own private use.