



Physics Through Python

PHYS 1699

Instructor Info

- Giancarlo Pereira (he/him)
- Office Hrs: TBD
- Pupin 7th Floor
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Course Info

- Prereq: None
- Mon
- 10.10-11.25a
- Pupin 414

Lab Info

- Fri
- 1-4p
- Pupin 414

TA Info

- TBD
- Office Hrs: TBD
- TBD

Course Description

This is a Physics course focused on building one of the most sought out professional skills: programming. Throughout the course, we concepts in physics (ranging from a pendulum swinging to heat transfer in an aluminium rod). In lecture, we will study the theory and equations that explain a lot of the phenomena around in; in lab, we will develop programs in Python that simulate the physics phenomena we learned in lecture. Ultimately, we will produce a full interactive software to replicate the physical phenomena.

What Will Class Be Like?

On Mondays, we will have two-hour lectures to study theoretical physics. The lectures will have a variety of activities, so do not expect to sit down for two hours and jot down notes. On Fridays, we will meet for three hours to learn programming.

Material

Any required articles, book chapters, and other relevant resources will be provided on Canvas.

Grading Breakdown

30%	Attendance/Participation
40%	Mini Projects
30%	Final Group Project

This course is not curved a priori, but I expect the median of the class to be around A-. No A+ are awarded in this course.

Final Group Project

Students will work in groups of four to create an interactive tool. The list of possible topics will be made available in the middle of the semester, but I am happy to meet with students about topics not covered by my list if you wish to do so. Students can expect these topics to cover some physical phenomenon, such as the swinging of a pendulum or heat propagation. I expect the tools to allow user interactions through a user interface. I do not expect students to have experience in design. Instead, we will discuss good practices for User Experience and User Interactions (UX/UI) during the semester. In addition to the tool, the group will prepare a 15-minute presentation to go over their project and do a live demo of how to use the tool.

Learning Objectives

In this course, students will:

- learn physics theory and identify its dictating equations
- program in Python
- create interactive software tools to replicate physical phenomena
- differentiate between good and poor user experience designs

FAQs

? Is attendance mandatory?

! Yes, we expect everyone to show up and significantly engage with instructor and peers. If there are extraordinary circumstances, please email me so we can advise a better plan.

? Do I need any programming experience?

! No. We will learn a lot of coding (mainly Python, but some HTML) together on Fridays and through mini projects.

Make-up Policy

Make-up exams or assignments will only be allowed for students who have a substantiated excuse approved by the instructor *before the due date*. Leaving a phone message or sending an e-mail without confirmation is not acceptable. Labs are mandatory. Make-ups for missing a lab consists of a 1 paragraph summary of a recent fish-oriented journal article highlighted in the news AND a 4 minute power point presentation on the article to the class. Any additional missed labs will result in zero credit for that lab.

Diversity and Inclusivity Statement

I consider this classroom to be a place where you will be treated with respect, and I welcome individuals of all ages, backgrounds, beliefs, ethnicities, genders, gender identities, gender expressions, national origins, religious affiliations, sexual orientations, ability - and other visible and non-visible differences. All members of this class are expected to contribute to a respectful, welcoming and inclusive environment for every other member of the class.

Access and Accommodations

If you are a student with learning needs that require special accommodation, contact the Office of Disability Services at 555-5555 or theiremail@email.com, as soon as possible, to make an appointment to discuss your special needs and to obtain an accommodations letter. Please e-mail me as soon as possible in order to set up a time to discuss your learning needs.

Academic Integrity

The University Code of Academic Integrity is central to the ideals of this course. Students are expected to be independently familiar with the Code and to recognize that their work in the course is to be their own original work that truthfully represents the time and effort applied. Violations of the Code are most serious and will be handled in a manner that fully represents the extent of the Code and that befits the seriousness of its violation.