

# University of Pittsburgh

Spring Term 2020-2021

Course title: *Physics of Human Body 2*

Credits: 1 (elective honors-level supplement to Intro Phys sequence)

Meeting time: *Zoom*, Wed 4:30–5:20 pm. Meeting ID: 929 5061 7512

Contact information: Dr. Matteo Broccio, [mbroccio at pitt]

Office hours: *Zoom*, schedule by email (subject “Phys Human Body”).

## Course description

This course is a honors-level supplement to the two-term algebra-based sequence that applies classical physics concepts, principles, and approaches to the workings of the human body. Processes inside the human body must obey physical principles, which often constrain or inform biological function. Also, most medical technology today completely relies on Physics-based techniques. Therefore, Physics has profound relevance in the career of anybody interested in any branch of the medical profession or biomedical research. The topics that we will discuss in this course include: scaling laws; hearing; vision; touch; peripheral nervous systems; basic psychophysics of perception.

A primary learning goal is to identify and apply Physics principles in various physiological situations and on occasion, in pathological situations. A secondary goal is the development or refinement of communication skills, as you will be giving an oral presentation near the end of the semester. You are expected to be equipped with basic algebra, trigonometry, and geometry. Other mathematical tools may be introduced during the term, focusing on their application. In any case, knowledge of calculus techniques is not required.

The course management website is [Canvas](#), which you can access using your Pitt credentials (help desk: 412-624-4357). You are expected to check Canvas at least twice a week. You will find reading materials, notes, feedback to discussions, and grade entries. Formally, there is no out-of-class homework.

## Pre-class prompts (food for thought)

Before class meetings, you are required to reflect on the *prompt* posted on [Canvas](#)) and anticipate one or more conceptual questions we might ask ourselves in that topic (*pre-class ‘priming’*). This prompt might be preceded by some “heads up” in the previous class meeting. It does not necessarily involve having a specific medical knowledge base in advance, but it rather serves as an intellectual stimulus for you before you participate in the in-class discussions.

## Is there a textbook?

Technically, no textbook is required. An interesting and comprehensive text for the curious student is “*Physics of the Human Body*” by Irving Herman (2nd edition), which is sold by all major online bookstores. I will occasionally refer to chapters from that book, but in a self-contained way – so you will not actually need to have the book.

## Class meetings: participation and assessments

To join class meetings, please download the Zoom app to your computer or tablet – unless you have already done so. The face time together will be mostly devoted to open discussion and active learning, after I give a *brief* lecture-style overview of the ideas. I will demonstrate or simulate physical processes and elicit discussions about them, whenever applicable. You will earn credit for mere participation (weighing 50% of your total grade), and the questions labeled “assessment” asked via Zoom polls will count toward your in-class assessment grade (weighing 50% of your total grade).

To ensure the free and open discussion of ideas, students may *not* independently record classroom lectures without the advance written permission of the instructor. I will make the meeting notes available to you, typically 12-24 hours after each Zoom meeting.

## Exams and presentations

There are no in-class exams. You will be asked to deliver an 8-to-10-minute oral presentation on a human body topic of your preference, chosen from a list circulated by the instructor at least three weeks in advance of the presentation date. You will submit a readable preview of your oral presentation to a shared folder following instructor’s guidelines by the due date (and should also be ready to answer asynchronous questions from the audience). Your oral presentation is *required* and weighs 20% of your total grade. More details are to be posted on Canvas.

## Help resources

You are surely not alone in your learning process. Consider all the following help resources available (at no additional cost!):

- Instructor’s office hours (Zoom, via quick email arrangement), to help you check your conceptual understanding, provide unconditional support, and help determine where you are currently positioned in your ideal ‘progress bar’.
- *Pitt Physics Server* of the Department of Physics and Astronomy. There, graduate teaching assistants will be able to virtually help you Mon–Fri with basic Physics or math issues, no appointment needed.

## Students with disabilities

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 two weeks into the semester. 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 or send an email to [drsrecep@pitt.edu](mailto:drsrecep@pitt.edu) to schedule an appointment. The Disability Resources and Services office is located in 140 William Pitt Union on the Oakland campus.

Please feel free to reach out to me if you have doubts or concerns in this general area.

## Academic integrity

All students 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 term will be required to participate in the procedural process, initiated at the instructor level, as outlined in the University Guidelines on Academic Integrity, publicly available at: <http://www.provost.pitt.edu/info/acguidelinespdf.pdf>.

## Grade calculation

Your numerical grade will be calculated using the weights shown in the following table. Note that the final presentation is required for you to receive a letter grade.

Item in master course gradebook	Weight, %
In-class participation (Zoom, synchronous)	50%
In-class assessments (Zoom, synchronous)	30%
Final presentation (to be uploaded on Canvas)	20%

## Updates and changes in scenario

Updates to any of the information in this document will have to be announced directly by me *both* in the virtual classroom and via Canvas to be actually in effect. Thanks for reading.