

# Science of Musical Sounds

PHYS 0082, section 30512, Fall 2020

Meetings: **Tue/Thu 1:00-2:15 pm** in 211 Lawrence Hall (or streaming).

Instructor: Dr. Matteo Broccio, [mbroccio@pitt.edu](mailto:mbroccio@pitt.edu)

Office hours: on Zoom, by individual appointment.

## Reference books

The material distributed on Canvas is designed to be self-contained. That said, I will also refer you to selected sections from “*The Physics and Psychophysics of Music*” (fourth edition) by Juan G. Roederer.

## Course description and goals

In this course we will examine musical sound from a objective scientific point of view. Topics include: musical sound properties (loudness, pitch, timbre); basis of musical practice (scales, intervals, and tunings); hearing and aural perception; sound production by musical instruments; room acoustics.

The successful student will be able to apply Physics principles to the perception of musical sound, the production of sound by musical instruments, the scientific basis of music theory, the propagation of sound, as well as sound technology. Students are expected to be equipped with a minimal amount of basic algebra and basic geometry. There are no formal prerequisites for this course, though some direct experience with musical practice and/or music notation may prove somewhat useful.

## Class meetings

Meetings will typically include acoustical and musical demonstrations, interactive discussions about the processes, and the explanation of the mathematical models we can use to accurately describe them. From time to time, you may be asked to collaborate with classmates in small groups. Your active participation (not mere attendance!) in up to 1/2 of the class meetings in the term will be worth 16% of your grade.

## Homework

Howework will be regularly assigned via Gradescope (instructions will be provided), and *random* portions will be graded based on correctness, the rest being evaluated on the sole basis of completion. Solution to homework problems will be discussed in class. After dropping your two lowest scores, the homework grade will be worth 48% of your course grade.

## Exams

There will be **two exams** delivered asynchronously, the weighted average of which will be worth 36% of your grade. (Their weeks are to be announced via Canvas.)

## Grading

Component of coursework	Percentage weight
Participation in up to 1/2 of class meetings	16%
Homework (two lowest scores dropped)	48%
Exams (weighted average)	36%

## Disability Resource 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 the Office of Disability Resources and Services, 140 William Pitt Union, 412-648-7890, as early as possible in the term. Disability Resources and Services will verify your disability and determine reasonable accommodations for this course.

## Academic Integrity

Cheating/plagiarism will not be tolerated. Students suspected of violating the University of Pittsburgh Policy on Academic Integrity, noted below, will be required to participate in the outlined procedural process as initiated by the instructor. A minimum sanction of a zero score for the quiz, exam or paper will be imposed. (The full Academic Integrity policy may be found at [www.provost.pitt.edu/info/ai1.html](http://www.provost.pitt.edu/info/ai1.html).)

## Health and safety policy

In the classroom, you will be **required** to wear face coverings at all times (you are not expected to snack or drink in the classroom) and respect social distancing. Lectures will also be streaming via Panopto, so you can participate even in the event you have specific personal concerns about sitting in the classroom. The complete safety guidelines issued by the University can be found at <https://www.coronavirus.pitt.edu/>. We will all constantly keep an eye on that page.

## Update policy

Any updates to information shown in this document will have to be announced directly by the instructor *both* in the classroom and on Canvas to be in effect.