

PHYS 1240: SOUND AND MUSIC

Summer 2021

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| Instructor: Tyler McMaken (he/him/his) | Time: MTWThF 11:20am–12:55pm MDT |
| Email: tyler.mcmaken@colorado.edu | Location: Zoom: cuboulder.zoom.us/j/91246952750 |
| Course Webpage: https://canvas.colorado.edu/courses/73941 | |

Course Overview:

Physics 1240, Sound and Music, is a 3-credit course designed for non-science students to explore the interrelation between art and science in a way that is both informative and enjoyable. The goals of the course are as follows:

1. Gain a physical intuition for how **sound** works, including how it can be *generated* (instruments, speaking, synthesizers, etc.), *transmitted* (wave dynamics, room acoustics, etc.), and *received* (human ears, microphones, psychoacoustics, etc.)
2. Explore how individual sounds can combine to form what we call **music**
3. Discover the **joy** in using science to understand how the world works (a.k.a. have fun learning!)

The course is taught by Tyler McMaken (“mick-MACK-en”), a graduate student and lecturer in the Department of Physics with past degrees in both physics and music. The course most days will consist of a Zoom lecture followed by a short online participation assignment that can be completed in groups during the second half of class time or, if a student chooses to view recorded lectures asynchronously, individually at a later time. The course will also include weekly homelab assignments, a short midterm student presentation (including the opportunity for you to play a musical instrument for the class, if you so choose), and a final exam.

Office Hours:

Though we cannot meet in person, one-on-one interactions with the instructor are still possible and are highly encouraged for all your classes. For this course, I will hold office hours on Zoom (meeting ID: [947 683 2401](https://cuboulder.zoom.us/j/9476832401)) every **Wednesday from 3–4pm MDT** and **Thursday from 3–4pm MDT** to answer any questions or simply to chat. You should also feel free to email me questions or set up a time to video chat (I can be very flexible with my schedule this time of year). The Physics Department has also created a [remote help room](#) for faculty and TAs to help students with any physics course throughout the week.

Textbook & Course Materials:

The recommended text for this course is *Principles of Musical Acoustics* by William Hartmann. The textbook is available online for free via the campus network (if you’re not on campus, you can set up a [VPN connection](#)). Readings corresponding to each lecture are posted on the course schedule. Additional online learning resources are posted on Canvas.

Necessary materials for this course include a calculator capable of computing logarithms, sines, and cosines (most phones nowadays can do this, or if nothing else, Google can), a portable sound recording device (phones or laptop microphones do just fine), some household objects like rubber bands and bottles for the homelabs, and access to [sound-analyzing software, which can be downloaded for free](#).

Prerequisites:

Though no prior college courses are required for enrollment in this course, all students must have two units of high school algebra and one of geometry (in other words, you may not have a math MAPS deficiency). High school math will be used regularly, but the course will not use or develop any higher mathematics.

Grading:

- A large portion of your grade (30%) will be determined by **daily participation assignments** due 24 hours after each lecture. These short Canvas quizzes are designed to be completed in Zoom Breakout Rooms with your peers during the second half of class time, but those viewing lectures asynchronously may complete them individually. You will get 3 tries for each quiz, and your lowest 2 assignments grades will be dropped.
- An additional 30% will come from **four weekly homelabs** due each Friday (July 9th, 16th, 23rd, and 30th) at 11:59pm MDT. These hands-on mini-projects will allow you to engage in the practice of science using sound-analyzing freeware and materials you can find around your house.
- The remaining 40% will come from a **midterm presentation** and a **final exam**. More information about these will be posted on Canvas.

| Assignment | Percentage of final grade | Date |
|---------------------------|---------------------------|-------------------------|
| Participation assignments | 30% | daily |
| Homelabs | 30% | due each Friday |
| Midterm presentation | 20% | determined individually |
| Final exam | 20% | Fri. August 6 |

Final letter grades will be assigned using the standard CU grading scheme, though this scheme may be slightly shifted at the instructor's discretion (but such a shift would only make final letter grades more favorable to students, never less favorable).

Late policy:

All participation assignments and written homeworks may be submitted at any point after their due dates until the last day of class. In the case of a late submission, 10% will be deducted for each day that the assignment is late, until 5 days have passed. After 5 days, the maximum score you may receive will remain at 50%. Exceptions may be granted if extenuating circumstances are brought to the instructor *before the assignment is due* (full credit is rarely given for after-the-fact excuses).

Incompletes:

Rules of the University require that grades of incomplete (I) may be assigned only if "*for reasons beyond the student's control, the student is unable to complete the course requirements.*" "I" requests must be made in person to the instructor.

Virtual instruction mode:

Lectures for PHYS 1240 will be given live on the video conferencing platform Zoom (information about setting up Zoom can be found [here](#)), and all students are encouraged to attend synchronously and engage actively during lectures (more on this in the next section). However, if you are not able to attend synchronously, you will not be penalized in the slightest—lectures will be recorded and posted on Canvas for asynchronous viewing, and all time-sensitive assignments and exams may be completed at any point within a 24-hour time frame. These recordings will only be made available to individuals registered for the course, for the duration of summer 2021.

Zoom security:

I will make every effort to make sure we can learn together in a safe, distraction-free, yet accessible environment. To ensure this, make sure you are logged into Zoom with your CU email account and that your Zoom name matches your own. In addition, the link and password for the Zoom meetings will only be shared with registered students, and under no circumstances may you share this information with anyone not registered for the class. Any student who disregards these guidelines or who themselves chooses to disrupt class will be dealt with appropriately.

Zoom etiquette:

Learning in a virtual classroom is much different from participating in person. It is much easier to get distracted or not engage fully, so below are some guidelines to help you get the most out of your experience. On the first day of class, we will collectively come up with a list of group norms based on our own values and needs, but until that time, here's a list for those attending synchronously to get you thinking:

- **Use your video** if you are able—this will not only help you to stay engaged and connect better with your peers (two crucial aspects of learning), but it will also help me as a teacher (it's much harder to teach to a bunch of black screens!).
- Try to **engage** in each class as much as you would in person—try to ask at least one question each lecture, participate in all clicker questions, and make the most of your Breakout Room time. Don't try to multitask, use your phone, etc.; give your full attention to the class.
- **Be punctual.** It is much easier to lose track of time both for the instructor and students in a virtual environment, so make an extra effort to show up to class on time, and I'll commit to making sure lectures don't go over time.
- **Mute your audio** to limit background noise distractions, unless you have a question or comment.
- **Take breaks** from the screen—95 minutes is a long time to be continuously present in a class, so I will do my best to leave time for breaks during class (most lectures will only take half the class time, followed by group activities), and if you do need to leave temporarily, be sure to mute your video and audio.

Accommodation for Disabilities:

If you qualify for accommodations because of a disability, please submit your accommodation letter from Disability Services to the instructor in a timely manner so that your needs can be addressed. Disability Services determines accommodations based on documented disabilities in the academic environment. Information on requesting accommodations is located on the [Disability Services website](#). Contact Disability Services at 303-492-8671 or dsinfo@colorado.edu for further assistance. If you have a temporary medical condition or injury, see [Temporary Medical Conditions](#) under the Students tab on the Disability Services website.

Classroom Behavior:

Students and faculty each have responsibility for maintaining an appropriate learning environment. Those who fail to adhere to such behavioral standards may be subject to discipline. Professional courtesy and sensitivity are especially important with respect to individuals and topics dealing with race, color, national origin, sex, pregnancy, age, disability, creed, religion, sexual orientation, gender identity, gender expression, veteran status, political affiliation or political philosophy. Class rosters are provided to the instructor with the student's legal name. We will gladly honor your request to address you by an alternate name or gender pronoun. Please advise us of this preference early in the semester so that we may make appropriate changes to our records. For more information, see the policies on [classroom behavior](#) and the [Student Code of Conduct](#).

Honor Code:

All students enrolled in a University of Colorado Boulder course are responsible for knowing and adhering to the Honor Code. Violations of the policy may include: plagiarism (including self-plagiarism), cheating, fabrication, lying, bribery, threat, unauthorized access to academic materials, clicker fraud, submitting the same or similar work in more than one course without permission from all course instructors involved, and aiding academic dishonesty. All incidents of academic misconduct will be reported to the Honor Code (honor@colorado.edu); 303-492-5550). Students who are found responsible for violating the academic integrity policy will be subject to nonacademic sanctions from the Honor Code as well as academic sanctions from the faculty member. Additional information regarding the Honor Code academic integrity policy can be found at the [Honor Code Office website](#).

Sexual Misconduct, Discrimination, Harassment and/or Related Retaliation:

The University of Colorado Boulder (CU Boulder) is committed to fostering a positive and welcoming learning, working, and living environment. CU Boulder will not tolerate acts of sexual misconduct (including sexual assault, exploitation, harassment, dating or domestic violence, and stalking), discrimination, and harassment by members of our community. Individuals who believe they have been subject to misconduct or retaliatory actions for reporting a concern should contact the Office of Institutional Equity and Compliance (OIEC) at 303-492-2127 or cureport@colorado.edu. Information about the OIEC, university policies, [anonymous reporting](#), and the campus resources can be found on the [OIEC website](#).

Please know that faculty and instructors have a responsibility to inform OIEC when made aware of incidents of sexual misconduct, discrimination, harassment and/or related retaliation, to ensure that individuals impacted receive information about options for reporting and support resources.

Religious Holidays:

Campus policy regarding religious observances requires that faculty make every effort to deal reasonably and fairly with all students who, because of religious obligations, have conflicts with scheduled exams, assignments or required attendance. If you anticipate a conflict, please contact the instructor within the first two weeks of class so that reasonable accommodations can be arranged. See the [campus policy regarding religious observances](#) for full details.