

PHYS 1240: SOUND AND MUSIC

Summer 2019

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| Instructor: Tyler McMaken (“mik-MACK-en”) | Time: MTWThF 11am – 12:35pm |
| Email: tyler.mcmaken@colorado.edu | Location: Duane Physics G1B30 |
| Course Webpage: https://physicscourses.colorado.edu/phys1240 | |

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, a graduate student and lecturer in the Department of Physics with degrees in both physics and music. The course consists of daily lectures interspersed with clicker questions, collaborative assignments, science demos, and music demos (including student performances, if possible). In addition, there will be weekly homework assignments due each Monday and two in-class exams, a midterm exam (Tues. July 23) and a final exam (Fri. August 9).

Office Hours & Grader:

- Tyler will hold office hours on Thursdays from 2:00–4:00 PM in Duane G2B90 (the Physics Help Room) to help with homework assignments, studying, or just to chat about physics or music! In addition, you can ask questions right after lecture at the front, or email to set up an appointment (I can be very flexible) at tyler.mcmaken@colorado.edu
- The TA and grader for the course is Jeff Dunagin, who will hold office hours on Fridays from 1:00–2:00 PM in the Physics Help Room and can be reached at jeffrey.dunagin@colorado.edu

Textbook:

The recommended text for this course is *Musical Acoustics* by Donald E. Hall, 3rd edition, Brooks/Cole, 2002 (ISBN-10: 0534377289, ISBN-13: 9780534377281). Additional online learning resources are available on the course website's [Resources tab](#).

Course Materials:

Each student will be required to purchase an [iClicker remote](#) from the CU Bookstore and to bring it to class every day. In order to obtain credit for actively participating in lectures via these clickers, you must [register your clicker](#) online.

Other necessary materials for this course include a calculator capable of computing logarithms, sines, and cosines (used for exams, homework assignments, and in-class participation), a recording device (phones or laptop microphones do just fine), 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 for this course (40%) will be determined by **four weekly assignments** due at the beginning of class on Mondays (July 15, July 22, July 29, and August 5), each of which has two equal components: (1) exercises drawn from the textbook and online resources, and (2) hands-on mini-projects (“homelabs”)—materials will be provided in class if needed.
- An additional 50% will come from **two in-class, 95-minute exams**, a midterm covering the first half of the course material and a final cumulative exam.
- The remaining 10% is determined by class participation, which consists of collaborative in-class **tutorial assignments** and **clicker questions**, neither of which will be graded for accuracy (their purpose is to demonstrate attendance and active engagement in class).

| Assignment | Percentage of grade | Date |
|--------------------|---------------------|-----------------|
| Clicker questions | 5% | daily |
| In-class tutorials | 5% | ~ twice a week |
| Weekly assignments | 40% | due each Monday |
| Midterm exam | 20% | July 23 |
| Final exam | 30% | August 9 |

All grades will be updated and posted on [Canvas](#) as the term progresses. Final letter grades will be assigned using a standard grading scheme with the following (inclusive) lower cutoffs, though this percentage scale 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):

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|--------------|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Lower cutoff | 0% | 60% | 63% | 67% | 70% | 73% | 77% | 80% | 83% | 87% | 90% | 94% |
| Letter grade | F | D– | D | D+ | C– | C | C+ | B– | B | B+ | A– | A |

Late policy:

Homework assignments are due each Monday at the beginning of lecture, with a 10-minute grace period. Homework assignments submitted any time after 11:10 AM on the Monday due date and before the end of the last day of class will be accepted with a 50% grade reduction, unless extenuating circumstances are brought to the instructor **before the assignment is due** (full credit is rarely given for after-the-fact excuses). Similarly, the instructor must be notified in advance if a student absolutely cannot attend class the day of an exam.

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.

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. In this class, if you anticipate a conflict, please contact Tyler within the first two weeks of class so that reasonable accommodations can be arranged. See the [campus policy regarding religious observances](#) for full details.