

SYLLABUS
Fall 2019
PHYS 051/MUSC 051
The Interplay of Music and Physics

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Class meetings: Tuesdays and Thursdays 2:00 – 3:15 p.m.
Phillips Hall 206 or Hill Hall 103, as announced
Final exam date: Saturday, December 7, 12:00 noon

Textbooks: *Measured Tones: The Interplay of Physics and Music* by Ian Johnston (any of the three editions available)

Class Sakai site: MUSC51.001.FA19

The class Sakai site contains all of the important information for the class, including the calendar showing the topics to be covered at each class meeting, reading assignments and reading quiz that must be completed before each class meeting (under “topic modules”), instructions for written and oral assignments, due dates for those assignments, announcements, location of class meetings, etc. Assignments for the class are to be submitted via the site, with a few exceptions as noted in the assignment instructions.

Each student is expected to do the assigned reading and complete the reading quiz before coming to class each day, and to participate in class discussions and other activities.

COURSE DESCRIPTION

This seminar is for students who are interested in how music is made, how sound is produced in instruments, and how those sounds have been used in music making from ancient times to the present day. Students will study the basics of physics and music: wave motion, resonance, the perception of sound, scales, harmony, and music theory. We will conduct four laboratory exercises (called etudes) in which students will work in small groups to investigate the acoustics of string, woodwind and brass instruments. Keyboards and percussion will also be considered, and students can pursue their areas of special interest in a research paper. The final project for each student will be a public performance of an original musical composition for an ensemble of instruments that the students have constructed themselves out of found objects.

COURSE GOALS

1. To gain a fundamental understanding of the physical principles underlying the production of musical sound
2. To gain an appreciation for how composers have used the acoustic characteristics of specific instruments in a musical context
3. To enhance skills in quantitative analysis of physical systems and phenomena

COURSE FORMAT AND PHILOSOPHY

The instruction in this course focuses on student-centered learning and involves active participation from the students. The instructors will act more as “coaches” who facilitate student learning, as opposed to pure “lecturers” who transmit knowledge without necessarily requiring thought or action on the part of the student. Since the instructional focus is on learning rather than teaching, students are expected to take more responsibility for their own learning than might be required in a more traditional lecture-only format. At the same time, frequent course assignments are designed to keep students "on track" through the learning process. To the extent possible, the instruction is aimed to meet a variety of learning styles. You are encouraged to spend a few minutes examining your own learning style using the on-line Index of Learning Styles survey (<http://www4.ncsu.edu/unity/lockers/users/f/felder/public/ILSpage.html>).

GRADING

- 5% Reading quizzes
- 5% Shorter assignments (2)
- 20% Etude reports (4)
- 15% Oral presentations (3, including Grand Finale)
- 20% Longer assignments (3)
- 10% Midterm exam
- 20% Final exam
- 5% Class participation

LATE POLICY

Unless you have made arrangements with the instructors prior to the due date or have an official University excused absence, you will lose 10% per day of the total points for the assignment for those turned in late.

ATTENDANCE POLICY

Students are expected to attend all class meetings and participate in all activities. Excused absences can be granted only by the instructors, one of whom must be informed in advance of the date of the absence except in cases of sudden illness or other emergency.

HONOR CODE POLICY

The Honor code and the Campus Code, embodying the ideals of academic honesty, integrity and responsible citizenship, have for over 100 years governed the performance of all academic work and student conduct at the University. Acceptance by a student of

enrollment in the University presupposes a commitment to the principles embodied in these codes and a respect for this significant University tradition. Your participation in this course is with the expectation that your work will be completed in full observance of the Honor Code.

Academic dishonesty in any form is unacceptable, because any breach in academic integrity, however small, strikes destructively at the University's life and work. If you have any questions about the Honor Code, please consult with someone in the Office of the Student Attorney General or the Office of the Dean of Students.

Students are expected to abide by the Honor Code in all classroom activities. Collaboration is explicitly allowed on assignments that are designated as group submissions. Discussion with other students prior to submitting an individual answer is also permitted. All other graded assignments (including exams) must be submitted without any aid not explicitly authorized by the instructors.

SYLLABUS CHANGES

The lead instructors reserve the right to make changes to the syllabus, including due dates and test dates. These changes will be announced as early as possible.