

Course Syllabus
Physics 240: Physics of Sound and Music
Fall Semester, 2021

Instructor:	Dr. Steven Sahyun
Office:	Upham Hall 157
Phone:	262-472-5113
E-mail:	sahyuns@uww.edu
WWW:	http://sahyun.net/courses/physcs240
CANVAS:	http://www.uww.edu/CANVAS
Class Meetings:	T R 12:30 p.m. – 1:45 p.m. in Upham Hall 166. See the attached schedule and at: http://sahyun.net/courses/physcs240/schedule.pdf for class meeting dates, class topics, homework and exam dates.
Course Modality:	This course is Face-to-Face instruction.
Exams:	There will be two mid-term exams and one final exam. Exams will be on-line with due dates given on the attached schedule for homework and mid-term exam dates. Final: Tuesday December 14, 12:15 p.m – 2:15 p.m.
Office Hours:	M F 9:00 a.m. - 9:50 a.m.; T R 10:00 - 11:30 a.m. or by appointment.
Required Text:	Principles of Musical Acoustics , Hartmann, Springer press. Available through UW-Whitewater text rental.

Additional articles and materials will be provided by your instructor.

Math Pre-requisite MATH 139 OR MATH 141 OR MATH 142

Note: The last day to drop classes is Sept. 16 (no 'W'); Oct. 25 ('W' grade.)

Other required materials: You are expected to bring a calculator (a "scientific calculator"-- one with trigonometric and logarithmic functions, scientific notation, etc. is preferred.) These are available for **less than** \$20 OR may be an app on your smart-phone.

Office hours are held by your instructor for your benefit. If you want to see your instructor and do not have free time during an office hour, please make an appointment. Appointments may be made after class, by phone, or by e-mail.

Course Description:

A descriptive course that deals with various properties of sound, the generation of sound by traditional musical instruments and the electronic production and reproduction of sound. The physical process of hearing and the acoustical properties of rooms are also included.

This is a GN Science Course. Courses in this area will explore the phenomena of the natural world in the context of everyday life and contemporary problems. This course will encourage curiosity and appreciation of scientific discovery and inquiry through the

examination of scientific processes. Students will develop their ability to read and comprehend scientific information and use that information to make judgements and draw appropriate conclusions about its influence on the world around them.

This is a one-semester introduction to the physics of sound and music! You can't wake up in the morning, walk down the street, or even sit in an open, quiet field without experiencing sound. It is such a common phenomenon that there is a tendency to think of it as very simple. In the way we use it every day, it can be... but, look (and listen) closer, and you will find there are innumerable facets to it, especially when extended to the sometimes mysterious realm of music. Why certain musical sounds seem so pleasant while others grate endlessly (which ones do which is, of course, a subject of taste) is a question that probably cannot be answered in words, but it certainly can be considered in interesting ways.

Course Learning Goals:

We will explore the worlds of sound and music in this course. Though this is a physics course, and we will use some algebra, but most of the material will be presented in terms of concepts, pictures and activities.

- understand, read, comprehend and discuss comfortably basic physical concepts of music and sound in general
- recognize similarities and differences, recognizing patterns, summarize information, generalize concepts, identifying problems and understanding the context, being able to research on your own and to collaborate with others, to work in team, to learn how to collaborate and adapt, how to respect the diversity of individuals.

Course Expectations

The following information outlines what is expected from you, the student learner, in an online course.

1. You are expected to participate in the course on a regular basis. There will be daily in-class activities and reading summaries that will be discussed in class. Also, there will be weekly homework.
2. You must make a commitment to actively learn. In a normal academic term, the university would tell you to schedule two hours per week for each credit per course for learning activities. (*3 credit course x 2 hours=6 hours/week for reading/learning course material + homework*)
3. Collaborating with other students enriches your learning activities. The course is designed to encourage and reward collaboration. Therefore, you are expected to participate in discussion forums and contribute to the body of knowledge for this subject throughout the course.

Assignments: The course will consist of participatory lectures. You will be frequently asked to work on questions related to the material under discussion. You will have a chance to discuss your answers with a neighbor, and then with the class as a whole. While not graded, these activities provide valuable opportunities to understand physics concepts.

Reading Summaries: There will be a reading summary due for each assigned reading chapter and are due at the start of the class as we will begin each day with a group discussion on your summary. Please submit your summaries on CANVAS.

Homework: Homework problems are assigned on a weekly basis. While you may work together on these problems, you are expected to do your own work. Homework is due before class the day for which it is due and will be assigned at least one week prior to the due date. Homework will generally be assigned as on-line CANVAS QUIZZES and will not be available after the due date so it is to your advantage to complete the quizzes as early as possible. You will have an unlimited number of tries on the quizzes up until the due time, but your score will be that of your last attempt.

Group Activities: There will be graded in-class group activities. These activities are included so that each student will learn to use basic measuring apparatus and methods. These activities may be made up if missed due to university-sponsored events, but prior approval is needed. Activity assignments received more than one class period after assigned will receive half credit.

Exams: Finally, there will be two mid-term exams as well as the final exam. The final will cover material from the entire course, with emphasis on topics covered since the second mid-term exam. In an effort to provide equal access and availability, exams will be available as a CANVAS QUIZ and will be available over a 1-day time-frame. Exams may be completed in-class on the assigned day or they may be completed remotely.

GRADING CRITERIA:

Course grades will be determined by the percentage of total points assigned for the course.

93% = A,	80% = B-,	67% = D+,
90% = A-,	77% = C+,	63% = D,
87% = B+,	73% = C,	60% = D-,
83% = B,	70% = C-,	< 60% = F.

The **approximate** distribution and estimated number of points are:

Course component	Point value	%
Homework (11 @ 10 pts each)	110	31%
Midterm 1	40	11%
Midterm 2	40	11%
Final	80	23%
Chapter summaries (24 @ 2 pts each)	46	13%
In-Class activities (20 @ 2 pts each)	40	11%
Total points =	356 points	

See the attached schedule for Exam and assignment dates.

I reserve the right to adjust grades slightly based on class participation. There will be occasional opportunities for extra credit.

I reserve the right to adjust grades slightly based on class participation. There will be a few extra credit opportunities posted on CANVAS and other occasional opportunities for extra credit may arise. Extra credit is limited to 10 points. Extra credit must be submitted in the CANVAS dropbox and must be submitted before the last class.

In the event of university closure (for example due to COVID or flu), I will attempt to post videos of relevant in-class experiments on CANVAS. In such an event, group discussions would occur on-line in the CANVAS forum area. Homework would be submitted to the CANVAS dropbox.

CANVAS Grade book: Grades (exams, activities, papers and homework items) will be posted on CANVAS as a **courtesy** and are for your information so that you can check that all your items have been accounted for. The CANVAS grade book is not the definitive score as transcription errors can occur, but it should match my personal grade book. Please inform me if you notice any errors. The homework and extra-credit totals will only be occasionally updated; I will try to update the grades at other times if requested.

Campus Policies and Practices Statement

Course Policy Regarding Video/Audio Recording:

In order to encourage a classroom environment where the free exchange of ideas is possible, video and audio recording must be limited to that done for educational purposes. Prior instructor permission and notification of fellow students is required for any video or audio recording.

The University of Wisconsin-Whitewater is dedicated to a safe, supportive, and non-discriminatory learning environment. It is the responsibility of all students to familiarize themselves with UWW policies regarding: Special Accommodations, Academic Misconduct, Religious Beliefs Accommodation, Absence for University Sponsored Events, the "Rights and Responsibilities" section of the Undergraduate Catalog or the "Academic Requirements and Policies" section of the Graduate Catalog, the "Student Academic Disciplinary Procedures" (UWS Chapter 14), and the "Student Non-academic Disciplinary Procedures" (UWS Chapter 17). Federal law requires all university employees to report information obtained during the course of their duties regarding sexual misconduct, including domestic and dating violence, unless otherwise exempt by state law. For more information, including on how to report an incident, see <http://www.uww.edu/sexual-misconduct-information>. If you have questions or concerns, you are encouraged to talk with your course instructor or department chair.

COVID related Policy: See the UW-Whitewater for the latest campus policy related to COVID.

Absence for University Sponsored Events

University policy adopted by Faculty Senate and the Whitewater Student Government states that students will not be academically penalized for missing class in order to participate in university-sanctioned events. They will be provided an opportunity to make up any work that is missed; and if class attendance is a requirement, missing a class in order to participate in a university event will not be counted as an absence. A university event is defined to be any intercollegiate athletic contest or other such event as determined by the Provost. Activity sponsors are responsible for obtaining the Provost's prior approval of an event as being university sanctioned and for providing an official list of participants. Students are responsible for notifying their instructors in advance of their participation in such events.

Additional Resources and information:

Some of good readings that you are encourage to have, are:

1. How Music works, by John Powell
2. Music Instinct, Phillip Ball
3. The Sound Book, Trevor Cox

You are also encouraged to watch TED presentations and the short movies related to hearing, speech and sound links are on CANVAS,

When answer questions, don't copy fragments from your book. I expect you to read and answer questions from the homework, using your own words. When you are using web information, I expect you to read and answer using your own words. Problems/questions from the homework will be also used in your mid-term exams, so be sure you understand your answers

I encourage you to work with someone else, but you need to turn in YOUR OWN ANSWERS/ HOMEWORK, DO NOT COPY.

Group Activities: Every other week you will have graded in-class group activities. These activities are included so that each student will learn to use basic measuring apparatus and methods. These activities may be made up if missed due to university-sponsored events, but prior approval is needed.

ABSENCE POLICY FOR QUIZZES AND EXAMINATIONS

1. Since the homework is available and to be submitted on-line, there will be no make-up of missed homework assignment, if you have an unexcused absence. If you are absent from class when the homework is assigned, you are expected to obtain the problem from a classmate and hand it in at the required time. A missed homework assignment will be recorded as a zero grade.
2. Since the exams will be available for a period on-line, there will be no make-up of missed exams/quizzes unless you have an excused absence for a University activity, family emergency or significant health related problems. Written documentation is required and you have to inform the instructor in advance.

*** I reserve the right to modify the schedule as necessary.**