

## Term Information

Effective Term Spring 2024  
*Previous Value* Spring 2015

## Course Change Information

### What change is being proposed? (If more than one, what changes are being proposed?)

Add the opportunity to offer the course by distance learning (DL).

### What is the rationale for the proposed change(s)?

The Speech and Hearing Science department has been increasing its DL offerings in service of an eventual DL path through the undergraduate BA program. This is a required course for the BA.

### What are the programmatic implications of the proposed change(s)?

(e.g. program requirements to be added or removed, changes to be made in available resources, effect on other programs that use the course?)

Offering this course by DL will advance the BA program closer to having a full DL offering. In the short term, there will be no curricular impact, but a proposal for a DL BA program path will be coming in the 23-24 academic year.

Is approval of the request contingent upon the approval of other course or curricular program request? No

Is this a request to withdraw the course? No

## General Information

Course Bulletin Listing/Subject Area	Speech and Hearing Science
Fiscal Unit/Academic Org	Speech & Hearing - D0799
College/Academic Group	Arts and Sciences
Level/Career	Undergraduate
Course Number/Catalog	3340
Course Title	Introduction to the Art and Science of Sound
Transcript Abbreviation	Art/Sci of Sound
Course Description	Designed to teach the basic principles of acoustics to undergraduate students in the Arts and Sciences who have had little previous experience with math or biological and physical sciences. The student should gain an appreciation of the concepts underlying the generation, transmission and measurement of sound waves traveling through air.
Semester Credit Hours/Units	Fixed: 3

## Offering Information

Length Of Course	14 Week, 12 Week, 8 Week
<i>Previous Value</i>	14 Week, 12 Week, 8 Week, 7 Week, 6 Week, 4 Week
Flexibly Scheduled Course	Never
Does any section of this course have a distance education component?	Yes
Is any section of the course offered	100% at a distance
<i>Previous Value</i>	No
Grading Basis	Letter Grade
Repeatable	No
Course Components	Laboratory, Lecture
Grade Roster Component	Lecture

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Credit Available by Exam	No
Admission Condition Course	No
Off Campus	Never
Campus of Offering	Columbus

## Prerequisites and Exclusions

Prerequisites/Corequisites	
Exclusions	
<i>Previous Value</i>	Not open to students with credit for 340.
Electronically Enforced	No

## Cross-Listings

Cross-Listings

## Subject/CIP Code

Subject/CIP Code	51.0202
Subsidy Level	Baccalaureate Course
Intended Rank	Freshman, Sophomore, Junior, Senior

## Requirement/Elective Designation

Required for this unit's degrees, majors, and/or minors

## Course Details

Course goals or learning objectives/outcomes	<ul style="list-style-type: none"><li>• Students will have a basic understanding of the measurement of sound and how it relates to other physical measurements.</li><li>• Students will have a basic understanding of the primary physical properties of sound.</li><li>• Students will have basic understanding of how complex sounds are created.</li><li>• Students will have a strong understanding of how room acoustic properties affect the transmission of complex sounds.</li></ul>
<i>Previous Value</i>	<ul style="list-style-type: none"><li>• <i>Be able to describe the anatomy of the human auditory system from pinna to cortex</i></li><li>• <i>Be able to define the metrics used in the measurement of sound</i></li><li>• <i>Be able to define the metrics used in the measurement of human auditory perception</i></li><li>• <i>Be able to define the concept of impedance as it applies to the human auditory system</i></li><li>• <i>Be able to apply the appropriate formulae used to quantify the measurement of sound (e.g., conversion of pressure to dB)</i></li></ul>

### Content Topic List

- Physical measurement systems including fundamental and derived units of measurement
- Simple harmonic motion and the methods used to describe it
- Fourier analysis of complex periodic motion into sine wave components and the synthesis of complex waves from sine waves
- Electrical current flow and electromotive force
- Impedance in mechanical, acoustical, and electrical systems
- Inverse-square law and propagation of sound energy in free air
- Resonance in simple spring-mass systems and complex systems such as air filled tubes
- Simple electrical circuit problems using Ohm's Law and Kirchoff's voltage and current laws
- Use of the decibel (dB) scale to express relative measures of intensity and power
- Application of inverse square law to sound propagation and the Doppler principle to moving sound sources
- Calculation of resonant frequencies (formants) of simple air-filled tubes
- The metric system of measurement used in electrical and acoustical instruments

### Sought Concurrence

No

### Attachments

- SPHHRNG 3340 DL syllabus.docx: DL syllabus  
*(Syllabus. Owner: Bielefeld, Eric Charles)*
- Syllabus\_SP23 SPHHRNG 3340.docx: In-person syllabus  
*(Syllabus. Owner: Bielefeld, Eric Charles)*
- SPHHRNG 3340 DL cover sheet - signed by ASC Tech.pdf: ASC Tech cover sheet  
*(Other Supporting Documentation. Owner: Bielefeld, Eric Charles)*
- SPHHRNG 3340 DL syllabus.docx: Revised DL syllabus to address Contingencies  
*(Syllabus. Owner: Bielefeld, Eric Charles)*

### Comments

- 1. Contingency: The Panel asks that the department clarify the number of exams that will be given...

Response: There is one exam, and the language throughout the syllabus has been revised to reflect that and be consistent throughout.

1. Contingency: The Panel requests that the department amend the online syllabus to provide more details about the types of posts and degree of peer interaction that students can expect in the discussion board assignments...

Response: Page 5 has been updated to include more content in the description of the discussion posts.

3. Contingency: The Panel asks that the department include on the course schedule (syllabus pg. 10-11) information about when during the week readings and quizzes must be completed.

Response: The syllabus calendar and description of quiz assignments have been updated to provide specifics about the day of the week on which the quizzes will be completed. *(by Bielefeld, Eric Charles on 05/31/2023 04:19 PM)*

- See email sent to department 04-03-2023 RLS *(by Steele, Rachel Lea on 04/03/2023 06:52 PM)*

**COURSE CHANGE REQUEST**  
3340 - Status: PENDING

Last Updated: Vankeerbergen, Bernadette  
Chantal  
06/01/2023

**Workflow Information**

Status	User(s)	Date/Time	Step
Submitted	Bielefeld, Eric Charles	02/22/2023 10:28 AM	Submitted for Approval
Approved	Fox, Robert Allen	02/25/2023 01:23 PM	Unit Approval
Approved	Vankeerbergen, Bernadette Chantal	03/08/2023 02:16 PM	College Approval
Revision Requested	Steele, Rachel Lea	04/03/2023 06:52 PM	ASCCAO Approval
Submitted	Bielefeld, Eric Charles	05/31/2023 04:19 PM	Submitted for Approval
Approved	Fox, Robert Allen	05/31/2023 09:07 PM	Unit Approval
Approved	Vankeerbergen, Bernadette Chantal	06/01/2023 02:09 PM	College Approval
Pending Approval	Jenkins, Mary Ellen Bigler Hanlin, Deborah Kay Hilty, Michael Vankeerbergen, Bernadette Chantal Steele, Rachel Lea	06/01/2023 02:09 PM	ASCCAO Approval



THE OHIO STATE UNIVERSITY

COLLEGE OF ARTS AND SCIENCES

**SYLLABUS: SPHRNG 3340**  
**INTRODUCTION TO THE ART AND SCIENCE OF SOUND**  
**SPRING 2024**  
**3.0 CREDIT HOURS**

## Course overview

### Instructor

Instructor: Sarah Yoho Leopold  
Email address: [leopold.41@osu.edu](mailto:leopold.41@osu.edu)  
Office hours: flexible by appointment  
Office Location: Zoom, URL TBD

### Class Meeting Schedule:

Element 1: Weekly synchronous Zoom meetings Tuesdays and Thursdays  
12:45–2:05 PM  
Element 2: Office hours on Zoom by appointment

### Course description

The course is designed to teach the basic principles of acoustics to undergraduate students in the Arts and Sciences who have had little previous experience with math or biological and physical sciences. The student should gain an appreciation of the concepts underlying the generation, transmission and measurement of sound waves traveling through air.

### Course management

The course will consist of synchronous Zoom lectures of roughly 70-80 minutes in duration twice per week. The weekly lecture content will be supplemented with discussion board interactions, weekly quizzes, two group projects, and a final exam.

## Course learning outcomes

- 1) Students will have a basic understanding of the measurement of sound and how it relates to other physical measurements
 

Student Learning Outcomes:

  - a. Students will be able to describe the particle and wave movement of acoustic energy
  - b. Students will be able to explain how harmonic acoustic motion is comparable to mass and spring systems.
  - c. Students will be able to articulate how and why the sine wave is a representation of a simple sound wave.
  - d. Students will be able to contrast the movement of sound through air with the movement of sound through liquids or solids.
  
- 2) Students will have a basic understanding of the primary physical properties of sound.
 

Student Learning Outcomes:

  - a. Students will be able to define the Hertz scale for measuring frequency.
  - b. Students will be able to describe the relationship between frequency and period.
  - c. Students will be able to explain how the decibel scale measures sound intensity and pressure.
  - d. Students will be able to define the wavelength of sound.
  - e. Students will be able to identify the different phases of a simple sound on the sound wave representation.
  
- 3) Students will have basic understanding of how complex sounds are created.
 

Student Learning Outcomes:

  - a. Students will be able to define the Fourier transform for complex sounds.
  - b. Students will be able to describe how resonance properties of different media alter the properties of sounds that pass through them.
  - c. Students will be able to identify the primary types of acoustic filters.
  - d. Students will be able to describe filter characteristics of rolloff and cutoff.
  - e. Students will be able to describe the basic properties of sound distortion including transient and frequency distortion.
  
- 4) Students will have a strong understanding of how room acoustic properties affect the transmission of complex sounds.
 

Student Learning Outcomes

  - a. Students will be able to describe the changes that a sound can undergo when it encounters a solid vertical barrier.
  - b. Students will be able to articulate how the inverse square law affects sound as it travels across distances.
  - c. Students will be able to define reverberation as it relates to room acoustics.

- d. Students will be able to describe the absorptive properties of various objects.
- e. Students will be able to articulate how to design a space, such as a classroom, to optimize the acoustical properties.

## How this Online course works

**Mode of delivery:** This course is 100% online. This course will use utilize synchronous sessions for content delivery, during which you must be logged in to Carmen at scheduled times (Tuesdays and Thursdays 12:45-2:05). The live meetings will be accessible through the 'Zoom' tab in the course's Carmen site. Recordings of the sessions will be available on Carmen, but the best way to engage with the material is through live participation.

**Pace of online activities:** This course is divided into **weekly modules** that are released one week ahead of time. Students are expected to keep pace with weekly deadlines for class activities and assignments. Students are encouraged to work at a pace that best fits their learning and schedule while completing assignments as directed on the syllabus. Students are responsible for communicating any questions or concerns about the material presented in a timely manner.

**Credit hours and work expectations:** This is a **3-credit-hour course**. According to Ohio State policy ([go.osu.edu/credithours](http://go.osu.edu/credithours)), students should expect around 3 hours per week of time spent on direct instruction (instructor content and Carmen activities, for example) in addition to 6 hours of homework (reading and assignment preparation, for example) to receive a grade of (C) average. The three hours of direct instruction will consist of the two synchronous weekly meetings (2 hours, 40 minutes) and time for completing quizzes, discussion board activities, and the group projects.

## Student participation requirements

Because this is a distance-education course, your attendance is based on your online activity and participation. The following is a summary of everyone's expected participation:

- **Logging in: AT LEAST ONCE PER WEEK**  
Be sure you are logging in to the course in Carmen each week, including weeks with holidays or weeks with minimal online course activity. (During most weeks you will probably log in many times.) If you have a situation that might cause you to miss an entire week of class, discuss it with me *as soon as possible*.
- **Office hours and live sessions: OPTIONAL OR FLEXIBLE**  
All live, scheduled events for the course, including my office hours, are optional. That said, the Zoom synchronous meetings will comprise the lecture material for the course. Therefore, attendance and participation are encouraged for all students. However, failure to attend/participate will not have a negative effect on your grade. I will provide a recording that you can watch later, but live participation is encouraged and will provide you with the best learning experience in the course.

## Course materials

### Required

Introduction to Sound: Acoustics for the Hearing and Speech Sciences; 4th Ed.; Author: Charles E. Speaks; Available at Amazon & the OSU bookstore.

## Course technology

### Technology support

For help with your password, university email, Carmen, or any other technology issues, questions, or requests, contact the Ohio State IT Service Desk. Standard support hours are available at [ocio.osu.edu/help/hours](https://ocio.osu.edu/help/hours), and support for urgent issues is available 24/7.

- **Self-Service and Chat support:** [ocio.osu.edu/help](https://ocio.osu.edu/help)
- **Phone:** 614-688-4357(HELP)
- **Email:** [servicedesk@osu.edu](mailto:servicedesk@osu.edu)
- **TDD:** 614-688-8743

### Technology skills needed for this course

- Basic computer and web-browsing skills
- Navigating Carmen ([go.osu.edu/canvasstudent](https://go.osu.edu/canvasstudent))
- CarmenZoom virtual meetings ([go.osu.edu/zoom-meetings](https://go.osu.edu/zoom-meetings))

### Required equipment

- Computer: current Mac (MacOs) or PC (Windows 10) with high-speed internet connection
- Webcam: built-in or external webcam, fully installed and tested
- Microphone: built-in laptop or tablet mic or external microphone
- Other: a mobile device (smartphone or tablet) to use for BuckeyePass authentication

### Required software

- Microsoft Office 365: All Ohio State students are now eligible for free Microsoft Office 365. Full instructions for downloading and installation can be found at [go.osu.edu/office365help](https://go.osu.edu/office365help).



# Grading and faculty response

## Grades

Assignment or category	Points
10 Weekly Quizzes	15 pts each =150 points
Weekly Discussion Board posts	100 pts
Group Presentation	200 pts
Presentation Reflection	50 pts
Group project	200 pts
Project Reflection	50 pts
Exam	250 pts
<b>Total</b>	<b>1000 points</b>

See course schedule, below, for due dates

## Assignment information

**Description of the quizzes:** Each module includes a timed quiz based on the assigned reading material for that module. You will have ten minutes to answer five questions. You will only have one attempt per quiz, so please make sure that you have access to a stable internet connection, you have read the assigned reading material, and you are free from distractions. No makes ups or exceptions will be allowed.

For the quizzes, students will have a 12-hour window 9:00 AM to 9:00 PM in which to complete it. Once the quiz/exam is started, it will be timed to the 10-minute time limit. The quizzes will occur on Wednesdays each Week 1-11, excepting any weeks in which Wednesday is a holiday.

**Academic integrity and collaboration:** You must complete the quizzes yourself, but you are free to access resources (notes, textbook) to help you produce your answers.

**Description of the discussion board posts:** Each week, you will be required to post at least once to the discussion board on topics related to the content of that week. There are two types of discussion boards. There are 'Office Hours' boards- these are not graded and are there for you to ask questions related to the course content or course navigation/design. If your question is particularly time sensitive or of a personal nature, please send Dr. Leopold a direction message or an e-mail. The module discussions are graded. You will be required to submit one question

and answer two questions per module. Your grade will be based on completeness as well as the quality and content of your question and answers. I will provide prompts that you can use to create responses.

**Academic integrity and collaboration:** Module discussion posts must reflect your own unique thoughts and opinions, and they cannot be plagiarized from other sources or other students' posts.

**Description of the group presentation:** In groups, you will present on a topic related to acoustics. Each presentation should be 20 minutes, and include the following information (at a minimum):

- Introduction to the topic
- Basic scientific concepts involved
- Applications in everyday life
- Overview of professions related to the area
- Interesting facts and information

You should include citations for your sources. Please use APA format.

Each group member will also submit a one-page reflection paper, which will be a summary of your subjective impressions of each group members contributions to the presentation.

**Academic integrity and collaboration:** The presentation will be a collaborative effort to which each much member of the group must make equal, significant contributions. You must complete the reflection paper yourself, without any external help or communication with other students.

**Description of the project:** Imagine that you have been hired as a speech-language pathologist for a brand new charter school that is under construction. You have been asked to design a classroom in a way that optimizes the acoustics for a student or students with hearing loss. In pre-assigned groups, you will work with your fellow classmates to develop a step-by-step, how-to guide for the architects, engineers, and employees of the school district. Include all aspects of relevant design criteria such as the shape of the room, the building & classroom materials, placement/design of items including windows, structural beams/columns, HVAC, ceiling panels, interior design elements, layout of students within classroom, etc. For each recommendation, provide a justification for its inclusion. You can be creative with the layout and design of your guide, and it is suggested that you add visuals to support your recommendations. To guide your work, utilize the materials from the course, the information on classroom acoustics provided by [ASHA \(Links to an external site\)](#), and the information provided by the [Acoustical Society of America \(Links to external site\)](#). Other, high quality and reliable sources may be used as well. Remember to cite your sources in APA format. In addition to the how-to guide, each member will also submit a one-page summary of your subjective impression of all individual group members' contribution to the project.

**Academic integrity and collaboration:** The presentation will be a collaborative effort to which each member of the group must make equal, significant contributions. You must complete the reflection paper yourself, without any external help or communication with other students.

**Description of the exam:** The exam will consist of a mix of multiple choice and short answer questions, and will be timed to 90 minutes per exam. The exam will reflect readings and lecture material from the course. Students will have a 12-hour window 9:00 AM to 9:00 PM on the day of the exam in which to complete it. Once the quiz/exam is started, it will be timed to a 120-minute time limit.

**Academic integrity and collaboration:** You must complete the exam yourself, without any external help or communication with other students. The exam is not open-book/open-note, and no external materials should be used to assist you with your answers.

## Late assignments

**Absence and Makeup Policy:** Quizzes and the exam are due by 9:00 PM on the listed due date, and no late submissions will be accepted without appropriate explanation and documentation. Any medical or other reasons for late assignments must be approved by the instructor prior to the Quiz/Exam.

## Grading scale

93–100: A  
90–92.9: A-  
87–89.9: B+  
83–86.9: B  
80–82.9: B-  
77–79.9: C+  
73–76.9: C  
70–72.9: C-  
67–69.9: D+  
60–66.9: D  
Below 60: E

## Faculty feedback and response time

Email Response: The instructor will email you back within 8 hours during the week, and within 24 hours on weekends/holidays.

Graded Materials Return: Quizzes will be graded by the end of the submission date. The exam will be scored and grades reported within 7 days after the exam date.

# Other course policies

## Student academic services

Student academic services offered on the OSU main campus  
<http://advising.osu.edu/welcome.shtml>.

## Student support services

Student support services offered on the OSU main campus <http://ssc.osu.edu>.

## Academic integrity policy

### Policies for this online course

- **Quizzes and exam:** You must complete the midterm and final exam yourself, without any external help or communication. Quizzes are not permitted to use student collaboration, but the student is free to utilize resources from the course (notes, textbook) to answer quiz questions.
- **Reusing past work:** In general, you are prohibited in university courses from turning in work from a past class to your current class, even if you modify it. If you want to build on past research or revisit a topic you've explored in previous courses, please discuss the situation with me.

Ohio State's academic integrity policy:

It is the responsibility of the Committee on Academic Misconduct to investigate or establish procedures for the investigation of all reported cases of student academic misconduct. The term "academic misconduct" includes all forms of student academic misconduct wherever committed; illustrated by, but not limited to, cases of plagiarism and dishonest practices in connection with examinations. Instructors shall report all instances of alleged academic misconduct to the committee (Faculty Rule 3335-5-487). For additional information, see the Code of Student Conduct <http://studentlife.osu.edu/csc/>.

## Copyright disclaimer

The materials used in connection with this course may be subject to copyright protection and are only for the use of students officially enrolled in the course for the educational purposes associated with the course. Copyright law must be considered before copying, retaining, or disseminating materials outside of the course.

If I suspect that a student has committed academic misconduct in this course, I am obligated by university rules to report my suspicions to the Committee on Academic Misconduct. If COAM determines that you have violated the university's Code of Student Conduct (i.e., committed academic misconduct), the sanctions for the misconduct could include a failing grade in this course and suspension or dismissal from the university.

If you have any questions about the above policy or what constitutes academic misconduct in this course, please contact me.

Other sources of information on academic misconduct (integrity) to which you can refer include:

- Committee on Academic Misconduct web page ([go.osu.edu/coam](http://go.osu.edu/coam))
- Ten Suggestions for Preserving Academic Integrity ([go.osu.edu/ten-suggestions](http://go.osu.edu/ten-suggestions))

## Statement on title IX

Title IX makes it clear that violence and harassment based on sex and gender are Civil Rights offenses subject to the same kinds of accountability and the same kinds of support applied to offenses against other protected categories (e.g., race). If you or someone you know has been sexually harassed or assaulted, you may find the appropriate resources at <http://titleix.osu.edu> or by contacting the Ohio State Title IX Coordinator at [titleix@osu.edu](mailto:titleix@osu.edu)

## Accessibility accommodations for students with disabilities

**The University strives to make all learning experiences as accessible as possible. In light of the current pandemic, students seeking to request COVID-related accommodations may do so through the university's request process, managed by Student Life Disability Services. If you anticipate or experience academic barriers based on your disability (including mental health, chronic or temporary medical conditions), please let me know immediately so that we can privately discuss options. To establish reasonable accommodations, I may request that you register with Student Life Disability Services. After registration, make arrangements with me as soon as possible to discuss your accommodations so that they may be implemented in a timely fashion. SLDS contact information: [slds@osu.edu](mailto:slds@osu.edu); 614-292-3307; [slds.osu.edu](http://slds.osu.edu); 098 Baker Hall, 113 W. 12th Avenue.**

## Accessibility of course technology

This online course requires use of Carmen (Ohio State's learning management system) and other online communication and multimedia tools. If you need additional services to use these technologies, please request accommodations with your instructor.

- [Carmen \(Canvas\) accessibility](#)
- Streaming audio and video
- Synchronous course tools

## Mental health statement

As a student you may experience a range of issues that can cause barriers to learning, such as strained relationships, increased anxiety, alcohol/drug problems, feeling down, difficulty concentrating and/or lack of motivation. These mental health concerns or stressful events may lead to diminished academic performance or reduce a student's ability to participate in daily activities. The Ohio State University offers services to assist you with addressing these and other concerns you may be experiencing. If you or someone you know are suffering from any of the aforementioned conditions, you can learn more about the broad range of confidential mental health services available on campus via the Office of Student Life's Counseling and Consultation Service (CCS) by visiting [ccs.osu.edu](http://ccs.osu.edu) or calling 614--292--5766. CCS is located on the 4th Floor of the Younkin Success Center and 10th Floor of Lincoln Tower. You can reach an on call counselor when CCS is closed at 614--292--5766 and 24 hour emergency help is also available 24/7 by dialing 988 to reach the Suicide and Crisis Lifeline..

## Statement on Diversity

The Ohio State University affirms the importance and value of diversity in the student body. Our programs and curricula reflect our multicultural society and global economy and seek to provide opportunities for students to learn more about persons who are different from them. We are committed to maintaining a community that recognizes and values the inherent worth and dignity of every person; fosters sensitivity, understanding, and mutual respect among each member of our community; and encourages each individual to strive to reach his or her own potential.

Discrimination against any individual based upon protected status, which is defined as age, color, disability, gender identity or expression, national origin, race, religion, sex, sexual orientation, or veteran status, is prohibited.

## Statement on Inclusive Practices in this Course

Our inclusive environment allows for religious expression. Students requesting accommodations based on faith, religious or a spiritual belief system in regard to examinations, other academic requirements or absences, are required to provide the instructor with written notice of specific dates for which the student requests alternative accommodations at the earliest possible date. For more information about religious accommodations at Ohio State, visit [odi.osu.edu/religious-accommodations](http://odi.osu.edu/religious-accommodations).

## Course schedule

<u>Week #</u>	<u>Dates</u>	<u>Topic</u>	<u>Readings</u>	<u>Learning Outcomes</u>
1	1/11 & 1/13	Introduction and principles of physics		1a

		Wed 1/12: Quiz 1		
2	1/18 & 1/20	Sound waves WORKSHOP  Wed 1/19: Quiz 2	Chapter 1	1a; 1c, 1d
3	1/25 & 1/27	Simple harmonic motion  Wed 1/26: Quiz 3	Chapter 2 pages 47-84	1b; 2a; 2b; 2d; 2e
4	2/1 & 2/3	Impedance WORKSHOP  Wed 2/2: Quiz 4	Chapter 2, pages 84-101	1a; 1d
5	2/8 & 2/10	The decibel  Wed 2/9: Quiz 5	Chapters 3 and 4	2b
6	2/15 & 2/17	Complex sounds  Wed 2/16: Quiz 6	Chapter 5	3a
7	2/22 & 2/24	Distortion Workshop  Wed 2/23: Quiz 7	Chapter 7	3e
8	3/1 & 3/3	Resonance and Filtering  Wed 3/2: Quiz 8	Chapter 6	3b; 3c; 3d
9	3/8 & 3/10	Sound transmission Workshop  Wed 3/9: Quiz 9	Chapter 8 pp 291-307	4a; 4b
10	3/15 & 3/17	No classes – Spring Break		
11	3/22 & 3/24	Room Acoustics  Wed 3/23: Quiz 10	Chapter 8 pp 307-334	4c; 4d; 4e
12	3/29 & 3/31	Group presentations on frequency and phase		1; 2
13	4/5 & 4/7	Group presentations on sound intensity		1; 2
14	4/12 & 4/14	Group presentations on complex waves		2; 3
15	4/19 & 4/21	Classroom design projects due and reviewed		4
Finals week	4/27	<b>Final exam</b>		

# SP23 SPHHRNG 3340 - Art/Sci of Sound (20995)

SP2023 SPHHRNG 3340

## Introduction to the Art and Science of Sound

**Instructor** Sarah Yoho Leopold, Ph.D.  
[leopold.41@osu.edu](mailto:leopold.41@osu.edu)

**GTA** Aubrey Stoll  
[Stoll.179@buckeyemail.osu.edu](mailto:Stoll.179@buckeyemail.osu.edu)

Office hours by appointment/online discussions

**Required Textbook:** Introduction to Sound: Acoustics for the Hearing and Speech Sciences; 4th Ed.; Author: Charles E. Speaks; Available at Amazon & the OSU bookstore.

**Course Description:** Designed to teach the basic principles of acoustics to undergraduate students in the Arts and Sciences who have had little previous experience with math or biological and physical sciences. The student should gain an appreciation of the concepts underlying the generation, transmission and measurement of sound waves traveling through air.

### Course Objectives:

Major topics to be addressed in this course are:

- A. Foundations of Measurement – How physical quantities are measured.
- B. Sources of Sound – What is Sound, and how is it generated?
- C. Sound in Air – How sound travels through the air and other materials.
- D. Electro-acoustics – How we measure, record and/ or modify sound.
- E. The decibel Scale – Why we use the dB scale; how it simplifies life.
- F. Effects of Sound on people – Psychological and physiological effects.
- G. Sound in Enclosed Spaces – How a room affects sound inside it.

**Course Design:** This course includes in-class lectures, discussions, online knowledge check quizzes, a group presentation, a group project, and a final exam.

**Office Hours:** Office hour meetings can be requested in-person or via Zoom with Dr. Leopold or the GTA. In addition, there are pinned topics under the 'Discussions' tab for questions related to the course content and design. If your question is one you are comfortable others seeing, please post it there so that your classmates with the same question can also see the answer. Responses may take up to 48 hours, so if your question



is an immediate need or of a sensitive or personal nature, please send a message to Dr. Leopold and the GTA through the Carmen messaging system or by email.

**Quizzes:** Each module includes a timed quiz based on the assigned reading material for that module. You will have ten minutes to answer five questions. You will only have one attempt per quiz, so please make sure that you have access to a stable internet connection, you have read the assigned reading material, and you are free from distractions. No makes ups or exceptions will be allowed. Quizzes are available to be taken at any time and it is recommended that they are completed as each module is covered during the semester.

**Discussions:** There are two types of discussion boards. There are 'Office Hours' boards- these are not graded and are there for you to ask questions related to the course content or course navigation/design. If your question is particularly time sensitive or of a personal nature, please send Dr. Leopold a direction message or an e-mail. The module discussions are graded. You will be required to submit one question and answer two questions per module. Your grade will be based on completeness as well as the quality and content of your question and answers.

**Presentation:** In groups, you will present on a topic related to acoustics. Each presentation should be 20 minutes, and include the following information (at a minimum):

- Introduction to the topic
- Basic scientific concepts involved
- Applications in everyday life
- Overview of professions related to the area
- Interesting facts and information

You should include citations for your sources. Please use APA format.

Each group member will also submit a one page summary of your subjective impressions of each group members contributions to the presentation.

**Project:** DUE APRIL 18. Imagine that you have been hired as a speech-language pathologist for a brand new charter school that is under construction. You have been asked to design a classroom in a way that optimizes the acoustics for a student or students with hearing loss. In pre-assigned groups, you will work with your fellow classmates to develop a step-by-step, how-to guide for the architects, engineers, and employees of the school district. Include all aspects of relevant design criteria such as the shape of the room, the building & classroom materials, placement/design of items including windows, structural beams/columns, HVAC, ceiling panels, interior design elements, layout of students within classroom, etc. For each recommendation, provide a justification for its inclusion. You can be creative with the layout and design of your guide, and it is suggested that you add visuals to support your recommendations. To guide your work, utilize the materials from the course, the information on classroom acoustics provided by [ASHA Links to an external site.](#), and the information provided by the [Acoustical Society of America. Links to an external site.](#) Other, high quality and reliable sources may be used as well. Remember to cite your sources in APA format. In addition to the how-to guide, each member will also submit a one-page summary of your subjective impression of all individual group members' contribution to the project.

**Exam:** DUE APRIL 26. A final exam will be given on Carmen at the end of the semester. Exam questions will primarily be short answer and will be based on both the lecture and reading material.

**Copyright:** Lectures and lecture materials in this course may be copyright protected and may not be recorded or distributed. The materials used in connection with this course are only for the use of students officially enrolled in the course for the educational purposes associated with the course. Copyright law must be considered before copying, retaining, or disseminating materials outside of the course.

**Grades:** Quizzes = 15%; Discussions = 10%; Presentation = 20%; Project = 20%; Exam = 25%; Presentation Reflections = 5%; Workshop Attendance = 5%

**Group Workshop Dates: January 19, February 2, February 23, March 9**

### Outline of Course

Module	Topic	Reading
Module 1	Principles of Physics & Units of Measurement	Ch. 1 Pgs. 1-24
Module 2	Sound Waves & Simple Harmonic Motion	Ch. 1 Pgs. 25-45 & Ch. 2
Module 3	Impedance & Decibels	Chs. 3, 4, & 5
Module 4	Complex Waves & Distortion	Chs. 6 & 8
Module 5	Resonance & Filtering	Ch. 7
Module 6	Sound Transmission & Room Acoustics	Chs. 9 & 10
Begin March 23	Group Presentations	
Due Apr 18	Classroom Design Project	
Due Apr 26	Course Review & Exam	

[Supplemental Relevant Videos](#)[Links to an external site.](#)

[NASA- What Is Sound?](#)[Links to an external site.](#)

[Popular Science- What Are Sound Waves?](#)[Links to an external site.](#)

### Course & University Policies

#### Grading Scale

A	93-100%
A-	90-92.9%
B+	87-89.9%
B	83-86.9%
B-	80-82.9%
C+	77-79.9
C	73-76.9%
C-	70-72.9%

D+	67-69.9
D	63-66.9%
E	62.9% or lower

### **Students with Disabilities**

If you anticipate or experience academic barriers based on your disability (including mental health, chronic, or temporary medical conditions), please let me know immediately so that we can privately discuss options. To establish reasonable accommodations, I may request that you register with Student Life Disability Services. After registration, make arrangements with me as soon as possible to discuss your accommodations so that they may be implemented in a timely fashion. SLDS contact information: [slids@osu.edu](mailto:slids@osu.edu); 614-292-3307; [slids.osu.edu](http://slids.osu.edu) [Links to an external site.](#); 098 Baker Hall, 113 W. 12<sup>th</sup> Avenue.

### **Academic Misconduct**

Academic integrity is essential to maintaining an environment that fosters excellence in teaching, research, and other educational and scholarly activities. Thus, The Ohio State University and the Committee on Academic Misconduct (COAM) expect that all students have read and understand the University's Code of Student Conduct, and that all students will complete all academic and scholarly assignments with fairness and honesty. Students must recognize that failure to follow the rules and guidelines established in the University's Code of Student Conduct and this syllabus may constitute Academic Misconduct.

The Ohio State University's Code of Student Conduct (Section 3335-23-04) defines academic misconduct as: Any activity that tends to compromise the academic integrity of the University, or subvert the educational process. Examples of academic misconduct include (but are not limited to) plagiarism, collusion (unauthorized collaboration), copying the work of another student, and possession of unauthorized materials during an examination. Ignorance of the University's Code of Student Conduct is never considered an excuse for academic misconduct, so I recommend that you review the Code of Student Conduct and, specifically, the sections dealing with academic misconduct.

If I suspect that a student has committed academic misconduct in this course, I am obligated by University Rules to report my suspicions to the Committee on Academic Misconduct. If COAM determines that you have violated the University's Code of Student Conduct (i.e., committed academic misconduct), the sanctions for the misconduct could include a failing grade in this course and suspension or dismissal from the University.

If you have any questions about the above policy or what constitutes academic misconduct in this course, please contact me.

### **Diversity**

The Ohio State University affirms the importance and value of diversity of people and ideas. We believe in creating equitable research opportunities for all students and to providing programs and curricula that allow our students to understand critical societal challenges from diverse perspectives and aspire to use research to promote sustainable solutions for all. We are committed to maintaining an inclusive community that recognizes and values the inherent worth and dignity of every person; fosters sensitivity, understanding, and mutual

respect among all members; and encourages each individual to strive to reach their own potential. The Ohio State University does not discriminate on the basis of age, ancestry, color, disability, gender identity or expression, genetic information, HIV/AIDS status, military status, national origin, race, religion, sex, gender, sexual orientation, pregnancy, protected veteran status, or any other bases under the law, in its activities, academic programs, admission, and employment.

To learn more about diversity, equity, and inclusion and for opportunities to get involved, please visit:

- <https://odi.osu.edu/>Links to an external site.
- <https://odi.osu.edu/racial-justice-resources>Links to an external site.
- <https://odi.osu.edu/focus-on-racial-justice>Links to an external site.
- <http://mcc.osu.edu/>Links to an external site.

### **Harassment, Discrimination, & Sexual Misconduct**

The Ohio State University is committed to building and maintaining a community to reflect diversity and to improve opportunities for all. All Buckeyes have the right to be free from harassment, discrimination, and sexual misconduct. Ohio State does not discriminate on the basis of age, ancestry, color, disability, ethnicity, gender, gender identity or expression, genetic information, HIV/AIDS status, military status, national origin, pregnancy (childbirth, false pregnancy, termination of pregnancy, or recovery therefrom), race, religion, sex, sexual orientation, or protected veteran status, or any other bases under the law, in its activities, academic programs, admission, and employment. Members of the university community also have the right to be free from all forms of sexual misconduct: sexual harassment, sexual assault, relationship violence, stalking, and sexual exploitation.

To report harassment, discrimination, sexual misconduct, or retaliation and/or seek confidential and non-confidential resources and supportive measures, contact the Office of Institutional Equity:

1. Online reporting form at [equity.osu.edu](https://equity.osu.edu/) Links to an external site.,
2. Call 614-247-5838 or TTY 614-688-8605,
3. Or Email [equity@osu.edu](mailto:equity@osu.edu)

The university is committed to stopping sexual misconduct, preventing its recurrence, eliminating any hostile environment, and remedying its discriminatory effects. All university employees have reporting responsibilities to the Office of Institutional Equity to ensure the university can take appropriate action:

- All university employees, except those exempted by legal privilege of confidentiality or expressly identified as a confidential reporter, have an obligation to report incidents of sexual assault immediately.
- The following employees have an obligation to report all other forms of sexual misconduct as soon as practicable but at most within five workdays of becoming aware of such information: 1. Any human resource professional (HRP); 2. Anyone who supervises faculty, staff, students, or volunteers; 3. Chair/director; and 4. Faculty member.



# Distance Approval Cover Sheet

## For Permanent DL/DH Approval | College of Arts and Sciences

Course Number and Title:

### Carmen Use

When building your course, we recommend using the [ASC Distance Learning Course Template](#) for CarmenCanvas. For more on use of [Carmen: Common Sense Best Practices](#).

A Carmen site will be created for the course, including a syllabus and gradebook at minimum.

If no, why not?

### Syllabus

Proposed syllabus uses the ASC distance learning syllabus template, includes boilerplate language where required, as well as a clear description of the technical and academic support services offered, and how learners can obtain them.

Syllabus is consistent and is easy to understand from the student perspective.

Syllabus includes a schedule with dates and/or a description of what constitutes the beginning and end of a week or module.

If there are required synchronous sessions, the syllabus clearly states when they will happen and how to access them.

Additional comments (optional):

### Instructor Presence

For more on instructor presence: [About Online Instructor Presence](#).

Students should have opportunities for regular and substantive academic interactions with the course instructor. Some ways to achieve this objective:

Regular instructor communications with the class via announcements or weekly check-ins.

Instructional content, such as video, audio, or interactive lessons, that is visibly created or mediated by the instructor.



- Regular participation in class discussion, such as in Carmen discussions or synchronous sessions.
- Regular opportunities for students to receive personal instructor feedback on assignments.

Please comment on this dimension of the proposed course (or select/explain methods above):

## **Delivery Well-Suited to DL/DH Environment**

*Technology questions adapted from the [Quality Matters](#) rubric. For information about Ohio State learning technologies: [Toolsets](#).*

- The tools used in the course support the learning outcomes and competencies.
- Course tools promote learner engagement and active learning.
- Technologies required in the course are current and readily obtainable.
- Links are provided to privacy policies for all external tools required in the course.

Additional technology comments (optional):

Which components of this course are planned for synchronous delivery and which for asynchronous delivery? (For DH, address what is planned for in-person meetings as well.)

If you believe further explanation would be helpful, please comment on how course activities have been adjusted for distance learning (optional):

## Workload Estimation

For more information about calculating online instruction time: [ODEE Credit Hour Estimation](#).

- Course credit hours align with estimated average weekly time to complete the course successfully.
- Course includes direct (equivalent of “in-class”) and indirect (equivalent of “out-of-class”) instruction at a ratio of about 1:2.

Provide a brief outline of a typical course week, categorizing course activities and estimating the approximate time to complete them or participate:

- In the case of course delivery change requests, the course demonstrates comparable rigor in meeting course learning outcomes.

## Accessibility

For more information or a further conversation, contact the [accessibility coordinator](#) for the College of Arts and Sciences. For tools and training on accessibility: [Digital Accessibility Services](#).

- Instructor(s) teaching the course will have taken Digital Accessibility training (starting in 2022) and will ensure all course materials and activities meet requirements for diverse learners, including alternate means of accessing course materials when appropriate.
- Information is provided about the accessibility of all technologies required in the course. All third-party tools (tools without campus-wide license agreements) have their accessibility statements included.

Description of any anticipated accommodation requests and how they have been/will be addressed.



Additional comments (optional):

## Academic Integrity

For more information: [Academic Integrity](#).

- The course syllabus includes online-specific policies about academic integrity, including specific parameters for each major assignment:
- Assignments are designed to deter cheating and plagiarism and/or course technologies such as online proctoring or plagiarism check or other strategies are in place to deter cheating.

Additional comments (optional):

## Frequent, Varied Assignments/Assessments

For more information: [Designing Assessments for Students](#).

Student success in online courses is maximized when there are frequent, varied learning activities. Possible approaches:

- Opportunities for students to receive course information through a variety of different sources, including indirect sources, such as textbooks and lectures, and direct sources, such as scholarly resources and field observation.
- Variety of assignment formats to provide students with multiple means of demonstrating learning.
- Opportunities for students to apply course knowledge and skills to authentic, real-world tasks in assignments.

Comment briefly on the frequency and variety of assignment types and assessment approaches used in this course (or select methods above):

## Community Building

For more information: [Student Interaction Online](#).

Students engage more fully in courses when they have an opportunity to interact with their peers and feel they are part of a community of learners. Possible approaches:

- Opportunities for students to interact academically with classmates through regular class discussion or group assignments.
- Opportunities for students to interact socially with classmates, such as through video conference sessions or a course Q&A forum.
- Attention is paid to other ways to minimize transactional distance (psychological and communicative gaps between students and their peers, instructor, course content, and institution).

Please comment on this dimension of the proposed course (or select methods above):

## Transparency and Metacognitive Explanations

For more information: [Supporting Student Learning](#).

Students have successful, meaningful experiences when they understand how the components of a course connect together, when they have guidance on how to study, and when they are encouraged to take ownership of their learning. Possible approaches:

- Instructor explanations about the learning goals and overall design or organization of the course.
- Context or rationale to explain the purpose and relevance of major tasks and assignments.

- Guidance or resources for ancillary skills necessary to complete assignments, such as conducting library research or using technology tools.
- Opportunities for students to take ownership or leadership in their learning, such as by choosing topics of interest for an assignment or leading a group discussion or meeting.
- Opportunities for students to reflect on their learning process, including their goals, study strategies, and progress.
- Opportunities for students to provide feedback on the course.

Please comment on this dimension of the proposed course (or select methods above):

## **Additional Considerations**

Comment on any other aspects of the online delivery not addressed above (optional):

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Syllabus and cover sheet reviewed by *Jeremie Smith* on

Reviewer Comments:

Additional resources and examples can be found on [ASC's Office of Distance Education](#) website.

I have completed and signed off on the preliminary distance learning review for the **SPHHRNG 3340 Introduction to the Art and Science of Sound** (see signed Cover Sheet attached). This syllabus includes all required syllabus elements and provides an overview of the course expectations.

I have a few *recommendations* that I think will improve the course design, add clarity to the syllabus, and support a successful review by the faculty curriculum committee:

- The description of expectations for the discussion board posts does not clearly specify student expectations. It is important to remember that students see discussion boards used in a wide variety of different ways. I recommend providing a description of expectations for this assignment. How long does a post need to be? Are responses to other students required or encouraged? What tone should be used (informal vs formal with citations).
- For the group presentation and project assignments, I recommend providing an indication of the size of the group and recommendations on forming groups for these assignments. What if a student has a particularly busy schedule with no obvious times outside of class to arrange meetings with group members? Will class time be used for meeting as a group (using Zoom breakout groups)?
- I found the descriptions of the group presentation and project reflection papers a bit confusing. Is this only for providing “subjective impressions of each group members contributions” or is there a component of these reflections that should be related to summarizing the presentation/project content? In the case of the presentation, project, and reflection papers, it seems that a simple rubric for these would greatly clarify expectations for students.
- Two required syllabus elements were recently updated and approved by the College Faculty Curriculum committee, the Statement on Disability Services & the Mental Health/CCS statement. You can find both of these here: <https://ascas.osu.edu/curriculum/syllabus-elements>

The ASC Office of Distance Education strives to be a valuable resource to instructors and departments in the College of Arts and Sciences. In addition to managing the [DL course review](#) process, [hosting ASC Teaching Forums](#), and developing an ever-expanding catalog of [instructor support resources](#), we also provide one-on-one instructional design consultation to ASC instructors interested in redesigning any aspect of their online course. If your department or any of your individual instructors wish to [meet with one of our instructional designers](#) to discuss how we can provide advice, assistance, and support, please do let me know.