PHYS 1270.001
Fall 2025
Science and Technology of Musical Sound
This syllabus is subject to revision throughout the semester

An updated Word/PDF version of syllabus is always uploaded on Canvas / PHYS 1270 section 001/ Files / Syllabus

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Instructor: Dr. Reiko L Zrnic
Office: GAB 525 C
E-mail: Reiko.Lukic-Zrnic@unt.edu **Office**
Hours: MW 11:00 AM -11:45 AM or
by email appointment

Lecture time: MWF 10:00 – 10:50 AM
Lecture location: PHYS 104

Course Content: This course is an introduction to the physics of sound as it relates to the production, propagation, and perception of music. We will explore the properties of sound and the physical characteristics of various musical instruments (including the human voice) to understand how we speak and how we perceive voice.

Recommended Text title: **Musical Acoustics,** 3rd edition by Donald E. Hall (Brooks/Cole: Pacific Grove CA, 2002, 2004)

Laboratory: Labs make up 25% of your overall grade. Labs for this course are conducted by the Physics Instructional Center (PIC) and have their own instructor, canvas page, and syllabus. I have no role in the lab section. Please email Matthew Abbott (matthew.abbott@unt.edu) if you have any questions about lab sessions, lab grades and other lab related requirements.

Attendance: You are expected to attend all lectures during this course. Lectures are designed to supplement and complement the material in the textbook. Missing lectures will likely have a direct negative effect on your ability to do well on exams and homework assignments.
Lecture PowerPoints will be uploaded on Canvas / Files / Lectures after each chapter lecture is completed. Please remember a PowerPoint lecture is only a summary of the text and may not include all the materials needed to be prepared for exams. You should study the text thoroughly and carefully for exams.
The lecture attendance/in class quiz makes 10% of your final grade for this course.

Homework: Homework makes 15 points out of 100 points of your overall grade. Homework is assigned on Canvas. Whenever new homework is assigned, I will announce it in the class and by a Canvas announcement. Homework problems and due times are specified on Canvas/Assignments.

Exams: As listed in the course schedule that follows, four (4) exams will be given: three (3) exams during the regularly scheduled class meetings and a final comprehensive exam as scheduled in the official UNT Final Exam Schedule. Exams contain multiple choice questions and problems.

Makeup Exams: For documented, University excused absences, contact your instructor prior to the exam or within 24 hours of the scheduled exam. Make-up exams must be completed within three (3) days of the original exam date.

Grading: Course grading is based on the total points earned from attendance, homework, labs, and exams. The point values for each category are given below:

Attendance/Quiz	10 points	10%
Labs	25 points	25%
Homework	15 points	15%
Exam 1	10 points	10%
Exam 2	10 points	10%
Exam 3	10 points	10%
Final Exam	20 points	20%
Overall Grade	100 points	100%

Total points	Course Grade
90 and above	A
80 to 89.9	B
70 to 79.9	C
60 to 69.9	D
below 60	F

Announcements and emails on Canvas: Please take emails send by me through Canvas seriously. I frequently make announcements on Canvas, reminding you various things, such as changes in the syllabus and schedule, changes in due times, recommendations before exams and etcetera. Also, I will contact individual students by email through Canvas, regarding their progress in the course.

This course is a part of the Life and physical sciences core. Courses in this category focus on describing, explaining and predicting natural phenomena using the scientific method. Courses involve the understanding of interactions among natural phenomena and the implications of scientific principles on the physical world and on human experiences.
Core Objectives:

- **Critical Thinking Skills,** including creative thinking, innovation, inquiry, and analysis, evaluation and synthesis of information**.**
- **Communication Skills,** including effective development, interpretation and expression of ideas through written, oral and visual communication.
- **Empirical and Quantitative Skills,** including the manipulation and analysis of numerical data or observable facts resulting in informed conclusions**.**
- **Teamwork,** including the ability to consider different points of view and to work effectively with others to support a shared purpose or goal.

Tips for success in this course:

1- Do not miss any class, you should not miss any attendance and quizzes points. A combination of attendance and quizzes make 10 points of your 100-point final grade. You should claim all 10 points easily, earning points in exams is harder for most students. Some similar problems and questions in quizzes might show up in your exams.
2- Work hard on your homework, your homework makes 15 points of final grade. You should show all steps and calculations to earn maximum points in homework problems. Some homework problems might show up in your exams.
3- Lecture slides will be uploaded on canvas before each session. Lecture slides contain definitions, equations, some explanations, and problems. I solve several problems in the class if needed. These problems are included in the lecture slides.
4- If you have difficulty understating concepts or doing your homework, get help as soon as possible. You should come and see me if you need help. There are free tutors on the second floor of physics building Physics Instruction Center (PIC) every day

Physics 1270.001
Fall 2025 Schedule

	Session		Date	Lecture		
Week 1	1	M	Aug 18	Syllabus and Introduction		
	2	W	Aug 20	Nature of soundwave		
	3	F	Aug 22	Properties of Soundwave		
Week 2	4	M	Aug 25	Properties of Soundwave (continued)		
	5	W	Aug 27	Properties of Soundwave (continued)		
	6	F	Aug 29	Properties of Soundwave (continued)		
Week 3		**M**	**Sep 1**	**Labor Day (No Class)**		
	7	W	Sep 3	Simple Harmonic Oscillation		
	8	F	Sep 5	Simple Harmonic Oscillation (continued)		
Week 4	9	M	Sep 8	Simple versus Complex Soundwave		
	10	**W**	Sep 10	Fourier Analysis and Synthesis		
	11	**F**	**Sep 12**	Fourier Analysis and Synthesis		
Week 5	12	M	Sep 15	Doppler Effect		
	13	W	Sep 17	Sound Intensity		
	14	F	**Sep 19**	**Exam 1**		
Week 6	15	M	Sep 22	Sound Intensity Level		
	16	W	Sep 24	Sound Intensity Level (continued)		
	17	F	Sep 26	Human Ear		
Week 7	18	M	Sep 29	Human Ear (continued)		
	19	W	Oct 1	Audiometry and Sound Loudness Level		
	20	F	Oct 3	Musical Pitch and Frequency		
Week 8	21	M	Oct 6	Sound Propagation Properties		
	22	W	Oct 8	Sound Propagation Properties (continued)		
	23	F	Oct 10	Sound Propagation Properties (continued)		

	Session		Date	Lecture		
Week 9	24	M	Oct 13	Diffraction		
	25	W	Oct 15	Diffraction (continued)		
	26	**F**	**Oct 17**	**Exam 2**		
Week 10	27	M	Oct 20	Vibration of String (continued)		
	28	W	Oct 22	Harmonics of Vibration of String		
	29	F	Oct 24	String Musical Instruments		
Week 11	30	M	Oct 27	String Musical Instruments		
	31	W	Oct 29	Sound in Pipes and Columns		
	32	F	Oct 31	Sound in Pipes and Columns (continued)		
Week 12	33	M	Nov 3	Sound in Pipes and Columns (continued)		
	34	W	Nov 5	Wind Musical Instruments		
	35	F	Nov 7	Wind Musical Instruments (continued)		
Week 13	36	M	Nov 10	Human Voice		
	37	W	Nov 12	Human Voice		
	38	**F**	**Nov 14**	**Exam 3**		
Week 14	39	M	Nov 17	Percussions		
	40	W	Nov 19	Percussions (continued)		
	41	F	Nov 21	Synthesizer		
Week 15		**M**	**Nov 24**	**Thanksgiving Break (No Class)**		
		W	**Nov 26**	**Thanksgiving Break (No Class)**		
		F	**Nov 28**	**Thanksgiving Break (No Class)**		
Week 16	42	M	Dec 1	Recording and Replaying Music		
	43	W	Dec 3	Recording and Replaying Music (continued)		
		F	**Dec 5**	**No Class: Reading Day**		
Finals Week		**Sat**	**Dec 6**	**Final Exam** **Saturday, Dec 6** **8:00 am – 10:00 am**		

Additional Policies and Procedures

Tardiness: If you arrive late, please enter quietly and sit down. Do not walk in front of speakers or disrupt the class in any other way.

Cell Phones: Cell phones should be silent for class and may NOT be used as a calculator during exams.

Extra Help: PLEASE DO NOT WAIT UNTIL THE LAST MINUTE.
If you are having trouble with this class, come by my office during office hours or make an appointment or see the **FREE tutors** provided by the Physics Department.

Academic Dishonesty: UNT's policy on Academic Dishonesty can be found at:
https://policy.unt.edu/policy/06-003

Dropping a Course: Drop information is available in the schedule of classes at:
https://registrar.unt.edu/registration/dropping-class

Academic Integrity Standards and Consequences*: According to UNT Policy 06.003, Student Academic Integrity, academic dishonesty occurs when students engage in behaviors including, but not limited to cheating, fabrication, facilitating academic dishonesty, forgery, plagiarism, and sabotage. A finding of academic dishonesty may result in a range of academic penalties or sanctions ranging from admonition to expulsion from the University.*

ODA Accommodation: UNT makes reasonable academic accommodation for students with disabilities. Students seeking accommodation must first register with the Office of Disability Accommodation (ODA) to verify their eligibility. If a disability is verified, the ODA will provide a student with an accommodation letter to be delivered to faculty to begin a private discussion regarding one's specific course needs. Students may request accommodation at any time, however, ODA notices of accommodation should be provided as early as possible in the semester to avoid any delay in implementation. Note that students must obtain a new letter of accommodation for every semester and must meet with each faculty member prior to implementation in each class. For additional information see the ODA website at disability.unt.edu.

The Student Perceptions of Teaching (SPOT*) is a requirement for all organized classes at UNT. This short survey will be made available to you on-line at the end of the semester and will provide you with an opportunity to provide feedback to your course instructor.* Near the end of the semester, you will receive an email from "UNT SPOT Course Evaluations via *IASystem* Notification" (no-reply@iasystem.org) with the survey link. Please look for the email in your UNT email inbox. Simply click on the link and complete your survey. After logging in to the my.unt.edu portal, students can access the SPOT survey site by clicking on the SPOT icon.A list of their currently enrolled courses will appear. Students complete each course evaluation independently. The SPOT is open for students to complete two weeks prior to final exams.

Emergency Notification & Procedures: UNT uses a system called Eagle Alert to quickly notify students with critical information in the event of an emergency (i.e., severe weather, campus closing, and health and public safety emergencies like chemical spills, fires, or violence). In the event of a university closure, please refer to Canvas for contingency plans for covering course materials.

Sexual Assault Prevention: UNT is committed to providing a safe learning environment free of all forms of sexual misconduct, including sexual harassment sexual assault, domestic violence, dating violence, and stalking. Federal laws (Title IX and the Violence Against Women Act) and UNT policies prohibit discrimination on the basis of sex, and therefore prohibit sexual misconduct. If you or someone you know is experiencing sexual harassment, relationship violence, stalking, and/or sexual assault, there are campus resources available to provide support and assistance. UNT's Survivor Advocates can assist a student who has been impacted by violence by filing protective orders, completing crime victim's compensation applications, contacting professors for absences related to an assault, working with housing to facilitate a room change where appropriate, and connecting students to other resources available both on and off campus. The Survivor Advocates can be reached at SurvivorAdvocate@unt.edu or by calling the Dean of Students Office at 940-565- 2648. Additionally, alleged sexual misconduct can be non-confidentially reported to the Title IX Coordinator at oeo@unt.edu or at (940) 565 2759.