PHYSICS 115: *Acoustics (Part I)*

Spring 2018 **Schedule** Online Syllabus: **http://www.uwsp.edu/physastr/Documents/kmenning/Physics115.pdf**
Web portal: **Desire2Learn**

Instructor:	Dr. Ken Menningen	**Office hours:**	M	T	W	R	F
Office:	B101 Science Building	9:00am - 9:50am	☺	☺	☺	☺	☺
Phone:	(715) 346-4871	11:00am - 12:00pm	☺	☺		☺	☺
email:	Ken.Menningen@uwsp.edu						
		By appointment	☺	☺	☺	☺	☺

Course Prerequisites: Math 107

Required text: *Hearing Science*, Emanuel and Letowski, 1st edition (available at Text Rental)

Other required materials: Scientific calculator (graphing capability is **not** necessary). It is also recommended you obtain a TurningPoint response unit ("clicker") that requires a $13 access code.

Course Objectives: *Acoustics* is a team-taught course that examines the physics of sound and waves, human hearing, and production and perception of human speech. Upon completion of this course you should be able to:

- Explain the fundamental concepts of the physics of sound and waves
- Use algebra to explain measurements and make predictions
- Explain the acoustic principles involved in human hearing and speech
- Identify and explain methods of producing, recording, transforming, and reproducing speech and other acoustic signals
- Describe and explain acoustical properties of various spaces

Acoustics satisfies the Interdisciplinary Studies requirement of the UWSP General Education Program. Upon completion of this course you should be able to:

- Identify an issue or question related to the *Acoustics* course, and describe what each discipline (physics and audiology) contributes to an understanding of that issue.
- Explain the benefits of being able to combine these contributions.

Attendance: Attendance is not required but it is a disadvantage to miss any lectures because the lectures, demonstrations, and in-class activities will greatly enhance your ability to understand the material. There will often be quizzes or assignments done in class that are worth points. If you are ill, please contact your instructor ***before class*** to make arrangements. Missed assignments, labs, or exams will count as a zero unless special arrangements are made.

Grading policy: The grade you earn in this portion of the class will be based upon the five assignment types listed below. A grading scale is also given for your reference. Grades are not curved, encouraging you to work together, but each student is expected to hand in their own work. **Notice that 50% of your final course grade will be determined from the portion of the course taught by Prof. Menningen, and 50% from the portion taught by Prof. Craig.**

Grading Scale

Letter	Score
A	90-100
B	75-89
C	60-74
D	50-59
F	0-49

Grade Breakdown

Assignment	Weight
Midterm exams	35%
Final exam	20%
Homework	15%
In-class work	10%
Labs	20%

Exams: Midterm exams are scheduled to occur on **February 20**, **March 16**, and **April 20**. These dates may change but it's not likely. The comprehensive final exam is scheduled for **Thursday, May 17 at 2:45 pm**.

Homework: Homework assignments will be given regularly. To avoid a zero for late homework you must warn your instructor by phone or email ***before they are due*** and make special arrangements. If you are too ill to complete the assignment, please see a doctor, and have the doctor write a note of excuse. You should not believe that the homework problems are sufficient practice for the exam. Instead it is recommended that you work out at least five additional problems for each chapter from the text, and review the class materials that are posted on the internet.

In-class work: During nearly every lecture there will be some **response questions** for which you may earn points by using the TurningPoint Cloud system. You will need to purchase a $13 Turning Technologies access code from the bookstore and check out a clicker (at no additional charge) from the IT Service Desk (LRC room 023, bring your UWSP student ID) to respond to polling. You will need to create a Turning Technologies account in order to register your device. Please use your UWSP email address to create an account here: https://account.turningtechnologies.com/account/ You can also find help with Turning Point Cloud here. There will occasionally be other in-class assignments completed on paper.

Labs: You must earn at least a 60% score in the laboratory portion to pass the course. The labs are designed to illustrate and expand upon the topics we cover in the lecture portion of the course. Make sure you complete the entire lab and that you understand the concepts underlying the lab activity.

Course Schedule: For a detailed course schedule with links to lecture content, see the online course schedule.

Week	Description
	Unit I: Sound Waves
1	Oscillations
2	Frequency and Fourier analysis
3	Wave propagation
4	Sound speed and pressure
	Exam I: Tuesday, February 20
	Unit II: Wave Phenomena
5	Sound intensity and decibels
6	Standing waves
7	Attenuation, Doppler effect
8	Interference and diffraction
	Exam II: Friday, March 16
	Unit III: Speech production and recording
9	Speech production and waveforms
10	Audio recording
11	Audio transformations
12	Digital signal processing and recording
	Exam III: Friday, April 20
	Unit IV: Audio transmission and acoustics
13	Audio transmitters
14	Human hearing
15	Room acoustics
	Final Exam: Thursday, May 17 (partly comprehensive)

Community Rights & Responsibilities:

Students with special needs should contact the Disability and Assistive Technology Center during the first two weeks of the semester in order to request accommodation. An Exam Accommodation Request Form is available online. Religious beliefs will be accommodated according to UWS 22.03 as long as the student notifies the instructor about the conflict within the first three weeks of class. Students are expected to maintain the highest standards of academic integrity for their work in this course. The University of Wisconsin-Stevens Point dedicated to a safe, supportive and non-discriminatory learning environment. It is the responsibility of all students to familiarize themselves with University policies regarding special accommodations, misconduct, religious beliefs accommodation, discrimination and absence for university sponsored events. (For details please refer to the Community Rights & Responsibilities documents, including the Student Academic Standards and Disciplinary Procedures document.)