

**SLHS 3301: Introduction to Acoustics
Fall Semester 2008**

Lectures: MWF 9:05 – 9:55 am (20 Shevlin)

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Office Hours: M 10-11:30, W 1-2:30 and by appointment in Room 10 Shevlin Hall

COURSE DESCRIPTION

This is a 3-credit course. Students who achieve the learning objectives will be able to:

- Demonstrate** an understanding of certain quantitative aspects of speech-language-hearing science, normal and disordered, including the nature of sound, sound transmission, and units of measurement;
- Apply** selected concepts from mathematics and physics to the study of speech and hearing;
- Solve** elementary equations that are applicable to acoustic measurements;
- Utilize** their understanding of terms such as frequency response, noise floor, dynamic range, signal-to-noise ratio, decibels, and percentage harmonic distortion to become more informed consumers when purchasing home audio equipment;
- Demonstrate** an understanding of the decibel(s); and
- Read** much of the research literature in speech and hearing science with greater understanding.

ORGANIZATION OF COURSE

- Class sessions will be devoted primarily to lecture, discussion, and examinations. The TAs will hold regularly scheduled office hours. If those hours conflict with your schedule, contact them at their email addresses to make other arrangements. You can also pose questions to the TAs or to the Instructor by email, and we will endeavor to respond to you as quickly as possible. It will ordinarily be easier to contact the Instructor by email than by telephone, though you should feel free to call if email is inconvenient.
- Students are *expected to attend all lectures* and to participate actively in discussion. Each student is responsible for information presented in class and for being aware of announcements and materials in class, in email and on course web site regarding examinations, special problems, etc.
- Examinations and Examination Format

Examinations will cover material presented in lectures and textbook. There will be three midterms (Chapters 1-2; Chapters 3-4; Chapters 5-6) and one final examination (Chapters 7-8). Scores for the three midterms and the final will be averaged and each of the four scores will be weighted equally in calculation of the final grade for the course. Each examination will focus *principally* on material in the two chapters noted above, but may well reflect in some measure material that has been covered since the beginning of the course. Lowest scored exam will be dropped.

TEXTBOOK

Speaks, C. (1999; **THIRD** Edition) Introduction to Sound: Acoustics for the Hearing and Speech Sciences. San Diego: Singular Publishing Group.

Speaks, C, Zobitz, M., and Carney, E. (1999) Course Notes and Workbook for Introduction to Sound: Acoustics for the Hearing and Speech Sciences. San Diego: Singular Publishing Group.

Course Notes and Supplemental Materials: Online WebVista via <http://myU.umn.edu>

Assignments: Assignments must be worked by students and be turned in to the TA(s) by *no later than the date listed on the daily schedule unless an alternative date is announced in class*. The percentage grade for each set of Practice Problems will be *decreased* by 20 percentage points for every day—exclusive of Saturdays, Sundays, and official University holidays—that the report is late.

Software: Examples will be demonstrated using Praat, which can be downloaded and installed for free from the following web page: <http://www.fon.hum.uva.nl/praat/>

EXPECTATIONS FOR STUDENTS

In accordance with the University of Minnesota Senate Policy, the average student in an average week should expect to devote 3 hours per week to a course for each credit hour of registration. This is a three-credit course. Thus, the average student in an average week should expect to devote 9 hours per week, including the three lecture hours per week.

GRADING

The final course grade will be weighted as follows: (Lowest exam score will be dropped.)

1 st exam	25%
2 nd exam	25%
3 rd exam	25%
4th exam	25%
Project 1	5%
Project 2	5%
Assignments	15%

On the S-N system, an S is equivalent to A, B, or C (including C-) on the A-F system. *S-N is not an option for undergraduates majoring in SLHS.*

Letter-Numerical Equivalent

A	93 - 100
A-	90 - 92
B+	87 - 89
B	83 - 86
B-	80 - 82
C+	74 - 79
C	66 - 73
C-	60 - 65
D+	57 - 59
D	50 - 56
F=	< 50

Incompletes

To receive an incomplete, all midterm examinations must have been completed before the scheduled time for the final with an average percentage grade of 50% or higher on the A-F system (60% or higher on the S-N system) and the reason (illness, emergency, hospitalization, and so forth) for missing the final exam must have been explained to the Instructor by the scheduled time for the final examination. The student and the instructor must complete and sign an AGREEMENT FOR THE COMPLETION OF INCOMPLETE WORK. This agreement must be finalized before grades are

submitted within 72 hours of the time of the final examination. To remove an I from your transcript, *a make-up final must have been completed before the end of the fourth week of the subsequent semester*. Make-up exams will be administered only under extremely unusual circumstances. If you must miss an examination, you must contact the Instructor by the time of the examination to explain your intended absence.

In accordance with Senate Policy,

A—achievement that is outstanding relative to the level necessary to meet course requirements

B—achievement that is significantly above the level necessary to meet course requirements

C—achievement that meets the course requirements in every respect

D—achievement that is worthy of credit even though it fails to meet fully the course requirements

S—achievement that is satisfactory, which is equivalent to a C- or better

F (or N)—represents failure (or no credit) and signifies that the work was either

1) completed, but at a level of achievement that is not worthy of credit, or

2) was not completed, and there was no agreement between the instructor and the student that the student would be awarded an I

Academic dishonesty in any portion of the academic work for a course shall be grounds for awarding a grade of F or N for the entire course.

I—In accordance with Senate Policy, a grade of I is assigned at the discretion of the instructor when, due to extraordinary circumstances, e.g., hospitalization, a student is prevented from completing the work of the course on time. I grades are not given simply because a student fails to complete assignments or misses taking the final examination. A grade of I requires a written agreement between instructor and student.

STRATEGIES FOR SUCCESS

- Read the relevant section(s) of the textbook prior to class. Jot down things you don't understand.
- Review the PowerPoint slides that will be covered prior to class.
- **Work through the Powerpoint slides.** The answer to the question on a slide is not provided, but we want you to try to supply the answer before coming to class. We will ask you in class. *If there are no volunteers, we might call on you.* There are at least three ways that you might find the answer before class: 1) reading ahead in the textbook; 2) recalling the information from a previous slide; and 3) reasoning.
- When a chapter has been completed, read the section, "Frequently Misunderstood Concepts," at the end of the chapter.
- Ask questions and participate in activities in class.
- Use materials (especially practice tests) on WebCT.

FREQUENTLY MISUNDERSTOOD CONCEPTS

An analysis of answers to examination questions by students over the past few years revealed that, although the mean score was a satisfactory 80%, a few questions were missed consistently by more than half of the students. For that reason, a section has been added to six of the eight chapters in the third edition of the textbook entitled, "Frequently Misunderstood Concepts." The purpose is to call specific attention to the kinds of mistakes that previous students have made and to attempt further clarification of the basic concepts that had been misunderstood.

This publication/material is available in alternative formats upon request. Please contact the Instructor if you require an alternative format. The University of Minnesota is committed to the policy that all persons shall have equal access to its programs, facilities, and employment without regard to race, color, creed, religion, national origin, sex, age, marital status, disability, public assistance status, veteran status, or sexual orientation.

SLHS 3301 Fall Schedule 2008

Week	Date	Cum.	Text chapter/Topic	Reading	Assignments due	
1	Sep 3	1	Ch 1: The nature of sound waves	Chapter 1		
	Sep 5	2				
2	Sep 8	3				
	Sep 10	4			<i>Assignment 1</i>	
	Sep 12	5	Ch 2: Simple harmonic motion	Chapter 2		
3	Sep 15	6				
	Sep 17	7				
	Sep 19	8				
4	Sep 22	9	<i>Review & Discussion</i>		<i>Assignment 2</i>	
	Sep 24	10	<i>Exam #1</i>			
	Sep 26	11	Chapter 3: Logarithms	Chapter 3		
5	Sep 29	12				
	Oct 1	13				
	Oct 3	14	<i>Chapter 4: the Decibel</i>			<i>Assignment 3</i>
6	Oct 6	15		Chapter 4		
	Oct 8	16				
	Oct 10	17				
7	Oct 13	18	<i>Review & Discussion</i>			<i>Assignment 4</i>
	Oct 15	19	<i>Exam #2</i>			
	Oct 17	20	Summary of Chapters 1-4			
8	Oct 20	21		Chapter 5		
	Oct 22	22	Chapter 5: Complex waves			
	Oct 24	23				
9	Oct 27	24				Acoustics Project 1
	Oct 29	25				
	Oct 31	26				
11	Nov 3	27	Chapter 6: Resonance and Filtering	Chapter 6	Assignment 5	
	Nov 5	28				
	Nov 7	29				
12	Nov 10	30	Review			
	Nov 12	31	<i>Exam #3</i>		Assignment 6	
	Nov 14	32	Chapter 7 Distortion	Chapter 7		
13	Nov 17	33				
	Nov 19	34				
	Nov 21	35	Chapter 8 Sound Transmission	Chapter 8	Assignment 7	
14	Nov 24	36				
	Nov 26	37				
	Nov 28		Holiday			Happy Thanksgiving!
15	Dec 1	38	Applications 1: Speech	<i>Online Materials</i>		
	Dec 3	39	Applications 2: Language			Assignment 8
	Dec 5	40	Applications 3: Hearing			
16	Dec 8	41	Applications 4: Music			
	Dec 10	42	Final Review & Discussion		Acoustics Project 2	
17	Exam #4 (Final) 08:00am-10:00am Wednesday, December 17 (20 Shevlin Hall).					