

Department of Communication Disorders  
ComD 421 Speech Science – Winter 2011

**Instructor**

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Office hours: Tuesday 1:00-3:00 or by appointment

**Blackboard**

Blackboard will be an essential component of the course. It will allow you to review lecture materials, download project instructions and software, and take quizzes.

**Prerequisites**

A good understanding of the introductory acoustics component of ComD 334 (hearing science) or Physics 167 is essential for you to be able to succeed in this class. We have a strong focus on acoustic phonetics this semester, so if you have not already had ComD 331 (phonetics), you may have problems in this class. It is also helpful if you have already taken ComD 320 (speech anatomy). If you did not take ComD 334 or Physics 167, please drop this class and take one of these before registering for this course next year. This semester's work will build on the foundation provided by the prerequisite courses and will not involve re-teaching things you should already know.

**Course Objectives**

What am I hoping you will learn this semester? The goal is that you will come to understand more about how speech works. You have already learned about the characteristics of sound, and also about anatomy and basic physiology. In this class we will bring these themes together by applying acoustic analysis techniques to normal and disordered speech. You will gain experience with recording speech into a computer and extracting meaningful measures of production from those recordings. As a communication disorders professional, you will need to know how to use technology in your clinical work. The profession's recently increased emphasis on evidence-based practice underlines the need for you to know how to gather your own treatment outcome evidence and evaluate that of others. By the end of this semester you should feel confident in using readily available software tools to document speech performance. You will also learn about the tools used by speech researchers so that you can get more out of the journal articles you read in our professional literature.

**Specific Objectives**

By the end of the course, you will be expected to demonstrate knowledge and competence in areas corresponding to ASHA's CAA standards in the Knowledge and Skills Acquisition (KASA) guidelines:

- Basic principles of speech production, including acoustic and physiological aspects and their measurement (standard III-B)
- Principles and methods of quantifying a variety of speech disorders, based on a sound grasp of the physiologic basis of normal function, with a goal of documenting treatment outcomes (standard III-D)

- The application of principles from the current research literature in measuring speech performance in preparation for participating in evidence-based practice (standard III-F)

### **Required Reading**

Ray Kent and Charles Read: *Acoustic analysis of speech* (2<sup>nd</sup> edition). Singular Publishing, 2002. 10 digit ISBN 0-7693-0112-6, 13 digit ISBN 978-0769301129. Seven chapters from other books are included in the readings packet. You will need to read these in preparation for class. This packet also includes a CD called “A Look at Speech Science.” The disc contains 20 illustrations/animations of speech science concepts that we will be covering this semester. Read carefully the text that shows up in the “Description” panel at the left when you single click on an icon. Then double click to play the animation.

An **optional** CD is also available at the bookstore called “ComD 421 Speech Science Lectures.” On this CD are the PowerPoint slides that will be shown in class this semester, along with audio commentary that I have recorded to explain each slide. This is intended as a resource if you have to miss class and need to catch up on the material. It may also help you in preparing for the exams.

### **Reading and CD Quizzes (on Blackboard)**

Fourteen open-book quizzes on the readings will be given throughout the semester. They will cover material from the Kent & Read text and the other chapters in the packet that will prepare you for our classroom discussion. They will be open for 45 minutes, so please ensure that you have read the material carefully in advance, rather than trying to skim the readings once you see the questions. You will not be able to preview these quizzes; once you open a quiz, you must finish it within 45 minutes. In addition, 18 simple questions in one quiz relating to some of the CD illustrations will be posted; this quiz is different in that you can take it a few questions at a time, with no time limit. All quizzes will be available until class begins on the date indicated in the syllabus. If you fail to take one by the due date, it will no longer be available, and you will have missed the credit for that quiz.

### **Software Projects**

Freeware programs will be provided for you to use on your own or another computer. There will be nine separate projects. Detailed instructions for each will be posted on Blackboard. These are not group projects. Please submit your own work. I encourage you to work with others if you would like to, so that you can learn together, but the data you submit must be your own, and each submission must be unique. These are due in class on the date indicated in the syllabus. Scores for late assignments will be reduced 10% for each working day beyond the deadline.

### **Examinations**

The two mid-term exams will cover material presented in the first and second parts of the semester respectively. Exam 1 is available starting on February 9<sup>th</sup> (ending on the

12<sup>th</sup>). Exam 2 will start March 16<sup>th</sup> (ending on the 19<sup>th</sup>). The final will be cumulative, and will be available throughout finals week. All examinations will be taken in the Testing Center.

**Extra Credit: Instructional DVDs in the LRC**

For two extra percentage points on the course grade, you may watch 2 DVDs in the Lee Library’s Learning Resource Center (LRC). There will be an on-line quiz for each DVD. I will provide the questions on Blackboard ahead of time so that you will know what to watch for in the DVDs. Please take the on-line quiz for each DVD by the due date in parentheses if you would like this extra credit. Feel free to do this early in the semester.

- 34R Human Speech Acoustics (April 1<sup>st</sup>)
- 35R Human Speech Source-Filter (April 8<sup>th</sup>)

**Learning your Names**

I am going to try to learn your names, although with a big class, this may take a while. I’ll also probably start forgetting some as I learn others. Either I or my assistant will video record you saying your name, where you are from, and one interesting thing about you. I will review these recordings and do my best to learn your name. I find it easier to remember people who ask and answer questions in class.

**Classroom Etiquette**

If you need to arrive late or leave early, please do so quietly. You are adults, and don’t need to provide reasons for missing class. I don’t take attendance, but you are responsible for turning in all assignments on time. Now and then you may want to share a brilliant speech science insight with the person sitting next to you. That’s just fine, but it must be brief. *People who sit and chat continually through the lecture will be invited to leave the room, because it is distracting to other students and to me. The same goes for texting, Facebook, etc. Please don’t do these in class because they distract others.*

**Grading**

Exam 1	20%
Exam 2	20%
Final Exam	25%
Reading and CD Quizzes	15%
Software Projects	20%
Extra Credit	2%

%	letter		%	letter
95	A		77	C
92	A-		74	C-
89	B+		70	D+
86	B		65	D
83	B-		60	D-
80	C+			

**The Honor Code**

As a student at Brigham Young University, you are expected to uphold the highest standards of integrity. With regard to exams and quizzes, this means that you work entirely alone, and agree not to disclose to others any information about the exam or quiz you may have already taken, which they are about to take.

### **Students With Disabilities**

Brigham Young University is committed to providing a working and learning atmosphere that reasonably accommodates qualified persons with disabilities. If you have any disability, which may impair your ability to complete this course successfully, please contact the Services for Students with Disabilities Office (422-2767). Reasonable academic accommodations are reviewed for all students who have qualified documented disabilities. Services are coordinated with the student and instructor by the SSD Office. If you need assistance or if you feel you have been unlawfully discriminated against on the basis of disability, you may seek resolution through established grievance policy and procedures. You should contact the Equal Employment Office at 422-5895. D-382 ASB.

### **Preventing Sexual Harassment**

Title IX of the Education Amendments of 1972 prohibits sex discrimination against any participant in an educational program or activity that receives federal funds. The act is intended to eliminate sex discrimination in education and pertains to admissions, academic and athletic programs, and university-sponsored activities. Title IX also prohibits sexual harassment of students by university employees, other students, and visitors to campus. If you encounter sexual harassment or gender-based discrimination, please talk to your professor; contact the Equal Employment Office at 801-422-5895 or 1-888-238-1062 (24-hours), or <http://www.ethicspoint.com>; or contact the Honor Code Office at 801-422-2847.

## Class Schedule

(subject to change... this is just the plan ☺)

		Topic	Reading	Quiz	Project
Jan	5	intro to speech science			
	10	source filter theory	K&R 1	1	
	12	source filter theory	K&R 2	2	
	17	holiday – no class today			
	19	analog electronics	RP: Decker	3	1 Source Spectrum
	24	basic instruments	RP: Silverman	4	
	26	digital systems			2 Audacity
	31	acoustic analysis	RP: Rosen	5	
Feb	2	acoustic analysis	K&R 3	6	
	7	acoustic analysis			3 Transfer Function
	9	exam 1 today – review			
	14	vowels and diphthongs	K&R 4	7	
	16	vowels and diphthongs			4 Vowel Formants
	21	holiday – no class today			
Tue	22	consonants	K&R 5	8	
	23	consonants			5 Consonant Timing
	28	consonants	K&R 6	9	
Mar	2	suprasegmentals			
	7	speech perception	K&R 7	10	
	9	fundamental frequency			6 Suprasegmentals
	14	speech intensity	RP: Kent	11	
	16	exam 2 today – review			
	21	laryngeal function			7 Fundamental Freq.
	23	no class – instructor away			
	28	laryngeal function	RP: Ferrand	12	
	30	speech aerodynamics			
Apr	4	speech aerodynamics	RP: Hillman	13	8 Speech Aero
	6	velopharyngeal function			
	11	speech movements		CD	9 Pre/Post Treatment
	13	speech movements	RP: Stone	14	

RP: readings packet

K&R: Kent and Read course text

CD: “A Look at Speech Science” quiz