

CMSD 4140

INTRODUCTION TO SPEECH & VOICE SCIENCES

SPRING 2003. TUES & THURS 11:00 – 12:15 PM RM. DAWSON 116 (3 HRS)

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Drop-in Office Hours: Monday & Wednesday Afternoons – 2:30 pm to 4:00 pm
E-mail Office Hours: Tuesday & Thursday Nights – 9:00 pm to 10:00 pm (via the Web)

A few of notes about office hours

- 1st: All students should feel free to drop-in and visit with me or the GA during our posted office hours in order to ask questions, seek tutoring, or discuss any concerns regarding the class. Please use these times to help yourself. My experience has been that those who have attended office hours typically do better than those who do not.
- 2nd: E-mail office hours are being setup and will consist of times that I will be “actively online” and able to field questions and respond immediately back to you. (Think of it as “virtual” office hours). Questions via e-mail are also welcomed at any other time during the day, of course, but will be answered only during my E-mail Office Hours.
- 3rd: If you cannot attend any of the posted office hours, other meeting times may be scheduled by appointment only.
- 4th: Before sending off an e-mail or making a trip out to visit with me, make sure that your question is not already answered or addressed in this syllabus.

Course overview & objectives

CMSD 4140 is a lecture-style course designed to provide the student with a fundamental and thorough understanding of the basic scientific principles associated with the quantitative analysis of speech production, perception, and physiology. The pre-requisite for this course is successful completion (a grade of C or better) of *CMSD 4120 Speech Anatomy & Physiology*. A working knowledge of physics and higher-order mathematics is desirable, but not required for success in the course.

UGA Bulletin course description

Application of basic physical principles to production and perception of speech and voice. Biomechanics of vocal fold oscillation; acoustics of voice source; resonance; acoustic phonetics; psychoacoustics of speech and voice. Interpretation of objective measures and outputs of computational models.

The topics to be discussed in this class include the following:

- Mathematical principles used to study the human vocal tract.
- The physics and biomechanics of vocal tract sound production.
- Acoustic Wave Theory and Simple Harmonic Motion.
- Physiological testing and operational parameters of the human vocal tract (including aerodynamic, muscle force, & kinematics).
- Theories of speech production and speech perception.
- New frontiers in the speech sciences & Clinical speech science applications

The objectives for this class include the following:

- Understand and use the scientific method to analyze, synthesize and evaluate the operation of the human vocal tract and appreciate the relevance of these scientific principles to functional vocalization and speech in clinical practice.
- Intuitively understand and synthesize together the mathematical and physical principles of vocalization with your knowledge of the structural components of the human vocal tract (content of CMSD 4120).
- Appreciate the comparative diversity of human vocal tract physiology as it pertains to vocalization in different age group populations, across gender, and within select disordered subject groups.
- Understand and demonstrate the ability to analyze, synthesize, and evaluate the importance of relations that exist between vocal tract muscular systems, and vocal tract structural tissues (cartilage, bone, connective).
- Be able to analyze and evaluate the importance and relation between muscular subsystems of the human vocal tract that work to produce changes in vocal tract shape, sound pressure, and airflow during speech.
- Be able to describe and evaluate a constellation of tools and techniques that are used today to investigate normal and disordered speech production.
- Be able to synthesize your knowledge of (1) normal anatomy and physiology of the human vocal tract (from CMSD 4120) and (2) your new understanding of quantitative analyses methods to appreciate more fully the pathophysiology of speech and non-speech disorders.

Grading & Assessment Procedures

Student assessment for this course will consist of the following activities:

- 4 exams and,
- 10 homework assignments

Exams

Four full-length exams will be given during the semester.

- Each exam is generally cumulative with a greater emphasis on the material since the previous exam.
- Exams 1 through 3 are each worth 50 pts. The Final Exam is worth 100 points.
- All exams are, for the most part, objective in format (i.e., multiple choice, fill-ins, matching, or labeling etc.), but subjective questions and short essays will be included.

- Exam questions will be derived from all course materials. (This means that attendance in class is important and will benefit you on exam days.)

Homework Assignments

Ten 10 point homework assignments will be administered, yielding a total possible homework grade of 100 points for the course.

- Homework assignments will consist of computational problem sets, written responses to questions, and various other assignments that fit with the topic currently under discussion
- The assignments are designed to help you practice and review important concepts and information. They are an important pedagogical tool. Please take them seriously.
- Homework assignments are to be completed individually and only using your lecture notes from 4120 and 4140, WebCT outlines and assigned readings (see ***Note** below).
- **Since homework assignments are open-book style, they are an important opportunity for each of you to improve your overall class grade. Use these opportunities wisely.**
- Homework assignments will be due the next class meeting after each is assigned.
- Late assignments will not be accepted. (**Please Note:** *I'm going to be pretty strict on this rule, due to the number of students in the class...so please get these homework assignments in to me on time.*)

***Note:** I trust that you will perform your own work, but I am obligated by the University to remind you that intentional violation of the ground rules will be considered a very serious breach of academic integrity. Submission of your completed homework to me signifies that the academic work presented in your responses represents your individual effort and thought with no assistance from any out-of-bounds sources.

Exam Dates – Spring 2003	
Exam 1 (50 pts)	Thurs, February 6 th
Exam 2 (50 pts)	Thurs, March 6 th
Exam 3 (50 pts)	Thurs, April 10 th
Final Exam (100 pts)	Wednesday, May 7 th 8:00 - 11:00 am

Application Project (For Graduate Students only)

All enrolled graduate students will complete an applications project. The details and due dates for this project will be discussed with you as a group during the first week of classes.

Final Grades for 4140

- Your final grade for this course will be based on a grand total of **350 points** summed across your four exam scores and your homework assignments.
- Point totals will be translated into letter grades as follows:

1. 315-350 pts = A
2. 280-314 pts = B
3. 245-279 pts = C
4. 210-244 pts = D
5. 000-209 pts = F

Final Grades for Graduate Students (6120)

- Your final grade for this course will be based on a grand total of **400 points** summed across your four exam scores, your homework assignments, and the project score.
- Point totals will be translated into letter grades as follows:
 1. 360-400 pts = A
 2. 320-359 pts = B
 3. 280-319 pts = C
 4. 240-279 pts = D
 5. 000-209 pts = F

Course Policies and Important Dates

- Those students with documented special needs (such as cognitive, learning or physical handicaps), please see me during the first few days of class so that we may discuss your case and plan any modifications to the course that may be necessary.
- A grade of **C** or better is required in order for this course to count toward your completion of an undergraduate degree in Communication Sciences & Disorders.
- There are no extra-credit assignments provided.
- Drop & Add is from January 9th to 14th, 2003.
- The last day to drop this course with a grade of W is March 7, 2003. Anyone who drops the course after this date will receive an automatic grade of WF.
- Spring Break is from March 17 to 21st.
- Make up exams will only be considered in cases of documented illnesses or emergencies, The option of whether to provide a make-up exam is at the discretion of the instructor.
 1. In case you are suddenly ill or have an emergency, please let me know your status within 48 hours of the missed quiz or exam date by e-mail or in person.
 2. Any notification after the 48 hour period will generally not be accepted.
- Please refer to your current student bulletin, the Spring 2003 Schedule of Classes and/or you academic advisor for details about drop/add, course withdrawal policies and procedures, and any other general UGA academic policy.
- **The University of Georgia's Policy on Academic Honesty** will be **STRICTLY** followed for this course. In summary, all students are responsible for maintaining the highest standards of honesty and integrity in every phase of their academics. The penalties for academic dishonesty are severe and ignorance is not an acceptable defense. Please

familiarize yourself with the UGA Academic Honesty Policy by referring to the following web page for details: http://www.uga.edu/ovpi/academic_honesty/academic_honesty.htm

- As recommended by *UGA's Office of the Vice President for Instruction*, a couple of examples of academic dishonesty specific to this course are provided.
 - Copying another person's answers during a written exam.
 - Flagrant plagiarism of material or ideas for submitted written assignments.

Some important suggestions to help you succeed!

- **It will be essential for you to review the vocal tract anatomy and physiology covered in CMSD 4120 frequently during this course.**
 - **Basic review of this material will be your responsibility.**
- **It is VERY important to stay on top of your assignments and studying for this class.**
 - **You will be amazed how quickly a large amount of information accumulates in a short period of time.**
- Study your materials a little everyday.
 - Trust me; it'll be very hard to cram all this information the night before an exam.
- Download the outlines from WebCT and review them prior to class.
- Visit my office hours if you are confused or need further explanations.
- Do the readings ahead of time.
 - This way the stuff I lecture on isn't brand new to you.
- **ASK QUESTIONS IN CLASS.** There is NO such thing as a stupid or silly question, so.... Please ask if something related to the lecture is not clear in your mind.
 - Believe it or not...prof's are not mind-readers.
- Develop study groups to help quiz each other and fill-in pieces of information from lecture or the readings you may have missed.
- Spend time reviewing past course material before tackling new information.
 - This course is additive in that your understanding of new concepts depends on your understanding of past material.
- Actively take notes in class and don't rely exclusively on the outlines I provide you.
- Draw LOTS of your own pictures and flow charts.
- Make up your own analogies and real-world examples to help you remember the material as you study. (These tend to stick with you for the long haul)
- **Last, (but not least), if your having trouble with the content, get help from me, the GA or one of you classmates ASAP! Please, don't wait! It is impossible to help you personally, if you don't identify yourself to me. Don't be shy.**

Materials

Required Textbooks & Supplies

1. Ferrand (2001). **Speech Science: An Integrated Approach to Theory & Clinical Practice**, Allyn & Bacon Publishing.
2. Zemlin, W.R. (1998). **Speech and Hearing Science: Anatomy and Physiology, (4th edition)**. Allyn & Bacon Publishing. (Same book from CMSD 4120)
3. Selected readings on reserve in OIT (2nd Floor Aderhold). Copies of these readings will also be posted on the door of my office. Please copy these readings and return the masters to their point of origin (OIT or my office door). Please be courteous and return all originals to their point of origin so that your classmates can use them too.
4. Access to a computer and the Internet.

Listserv

Class announcements will be made through the following listserv: speechphys-L@listserv.uga.edu

WebCT

- Open your preferred web browser.
- Go to the following URL: <https://webct.uga.edu/>. Fill-in the information in the login fields entitled “**Login to my WebCT**”. You must have a “**UGA MyID**” to access the new version of WebCT.
- Documents and figures that you will download and print will be posted to the website in PDF format (Adobe). Please be sure that your web browser has Adobe’s Acrobat Reader plug-in installed (www.adobe.com).

Web-Sites for help and information

- CMSD Homepage: <http://www.coe.uga.edu/csd/>
- Student Resources for WebCT: <https://webct.uga.edu/www/student.html>
- Student Electronic Services: <http://ses.uga.edu/>
- Division of Academic Assistance: <http://www.uga.edu/daa/>
- Important Dates for Students: <http://www.reg.uga.edu/or.nsf/public/acalendar>
- UGA Library: <http://www.libs.uga.edu/>
- University Computing and Networking Services: <http://www.uga.edu/ucns/>
- Lastly, it’s important to have fun and play too: <http://www.uga.edu/recsports/>

Two Final Thoughts.....

- You must always remember, that ‘*the struggle to understand*’ is by it’s very nature the heart and soul of learning, with confusion behaving as the engine that drives us along the pathway to enlightenment.

Anonymous

- Come to the edge, He said.
They said: we are afraid.
Come to the edge, He said.
They came.
He pushed them, and they flew.....

Guillaume Apollinaire (France: 1880 – 1918)

CMSD 4140 TOPIC SECTIONS AND READINGS

- Topic dates are flexible and strongly influenced by the pace of the class. The course syllabus is a general plan for the semester. Deviations announced to the class by the instructor (either verbally, through a listserv and/or through postings on the course website) may be necessary.
- Be sure to check the course website regularly for readings updates or other announcements.

Dates	Topic Sections	Readings
Jan - Feb	<ul style="list-style-type: none"> • What is Speech Science – Scientific Method <ul style="list-style-type: none"> • How to study for this class: Ideas and Strategies • What is a model vs. a theory? • Universality of Sound • Information in the speech signal • Pressures • Respiratory Physiology 	<ul style="list-style-type: none"> • OIT Reading # 1 • Ferrand - Chapter 2 (pages 7 - 14) • Ferrand - Chapter 4 & 5 • Other readings - TBA
Feb - March	<ul style="list-style-type: none"> • Basic Physics of Sound • Waves, Intensity & Simple Harmonic Motion • Laryngeal Physiology <ul style="list-style-type: none"> • Vocal Fold Physiology • Myoelastic-Aerodynamic Theory • Vocal quality, F₀, Jitter & Shimmer • Quantitative Voice Assessment Values 	<ul style="list-style-type: none"> • Ferrand - Chapter 2 (pages 14 - 40) • Ferrand – Chapter 6 & 7 • Ferrand – Chapter 3 • Other readings - TBA
March - April	<ul style="list-style-type: none"> • Acoustic Phonetics & Articulatory Dynamics <ul style="list-style-type: none"> • Resonance, • Transfer Functions & Filters, • The Source-Filter Theory, • Formants & Spectrographic analysis of vowels and consonants. 	<ul style="list-style-type: none"> • Ferrand – Chapter 2 (p. 40 - 47) • Ferrand – Chapter 8 & 9 • Other readings - TBA
April	<ul style="list-style-type: none"> • Applications in Clinical Speech Physiology. <ul style="list-style-type: none"> • Physiological Phonetics • Survey of Speech Physiology • Speech Aerodynamics • Models of speech perception, and speech production. • Basics of Digital Signal Processing. • Embryology of the Human Vocal Tract • New Frontiers in Speech Science 	<ul style="list-style-type: none"> • Other readings – TBA • Ferrand – Chapter 12 • Other readings – TBA
Final Exam – May 7th, 2003 - 8:00 am to 11:00 pm		