

SHS 375/598: Speech Science, Spring 2005
(Section line numbers: 39386 for SHS 375, and 44625 for SHS 598)
 Mondays & Wednesdays 3:15 - 4:30 p.m., COOR L1-38

Instructor: Michael F. Dorman
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 Office Hours: M W F 9-10, and by appointment
 Course materials and tests are also available via BlackBoard®:
<http://myasucourses.asu.edu/>

About Office Hours and Electronic Mail:

Please do not hesitate to contact me during office hours. The office hours are reserved for the students, and any student is welcome to consult with the instructor during those hours without making an appointment. If your schedule does not allow you to come during office hours, do not hesitate to request an appointment. You are also welcome to contact me via e-mail, in which case you should always start the subject line with "Speech Science" so that your message receives priority. **ANY** message with a blank or "generic" subject line (e.g., "Hi", "RE:", etc.) will be automatically deleted.

Course Description

The course is about the acoustics and perception of speech. Students will learn about the acoustics that specify consonant and vowel identity, i.e., what allows you to identify the vowel in 'beet' vs. 'bit', or the first consonant in 'bit' vs. 'pit'. Students will learn about the perceptual or cognitive processes that allow infants, children and adults to understand speech.

Required Textbook and Materials

Borden, G. J., Harris, K. S., & Raphael, L. J. (2002). *Speech science primer (4th ed.)*. Philadelphia, PA: Lippincott Williams & Wilkins.

Sjölander, K., & Beskow, J. (2004). WaveSurfer (Version1.7.5) [Computer software]. Retrieved from <http://www.speech.kth.se/wavesurfer/index.html>

Earphones and computer access

Optional Materials

Sensimetrics Corporation (1997). Speech Production and Perception I [Computer software].

Somerville, MA: Sensimetrics. (**OPTIONAL, but very useful resource**)

A microphone for home use (**OPTIONAL; quality varies depending on needs**)

Course materials and tests are also available via BlackBoard®:

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Course Requirements

Course Work:

The course will build on your evolving knowledge of the subject, so it is important to be up-to-date on the material and to have a solid foundation throughout the course. As we cover the material, you will be expected to read the assigned text **before** you come to class, and you **will be** asked to discuss the material in class. You are expected to take notes during lectures, and outlines of most of the lectures will be posted to our course website. **Please note** that the outlines are **not substitutes for the lectures**, but rather, they should be used in conjunction with your notes from the presentations, hands-on activities, and the text. There will be no opportunity to engage in a 'makeup paper' or other 'extra'

activity to increase one's score.

Certification Standards

Satisfactory completion of this course is intended to assist students in obtaining crucial skills to meet the standards set forth by the American Speech-Language-Hearing Association (ASHA) for the Certificate of Clinical Competence in Speech-Language Pathology, effective January 1, 2005. Specifically, this course addresses Standard III-B by providing students with knowledge of the acoustics and perception of speech. The course also incorporates information about the biological bases of speech production and issues involving some linguistic aspects of speech.

Please note that the examinations address some of the standards noted above (as specified under "Student Outcomes" on the last page of the *Syllabus*). Students registered for the undergraduate section can meet the specified standards by receiving 70% or better on the respective examination; students registered for the graduate section of the course must receive 80% or better in order to meet the respective ASHA competency requirements. Students who do not meet the ASHA competency requirements for a given examination can request an additional (alternate) test to attempt to pass the ASHA competency section (which will **not** affect the course grade). Requests for an alternate test to meet ASHA competency requirements must be made by the student within two (2) weeks after the original exam, and the alternate exam must be scheduled with the instructor within three (3) weeks after the original exam.

Standard III-B: The applicant must demonstrate knowledge of basic communication and swallowing processes, including their biological, neurological, acoustic, psychological, developmental and linguistic and cultural bases.

Knowledge and Skill Outcome Measures

Speech Science (SHS 375/598) provides students with academic knowledge about the acoustics and perception of speech, and it also includes hands-on activities involving computerized acoustic measurements. Throughout the course, students learn about various aspects of acoustic phonetics and obtain skills that enable them to perform computerized acoustic analyses that are tested in the form of examinations and take-home assignments. See the section on "Student Outcomes" for specific knowledge and skill outcome measures.

Examinations:

There will be three examinations (see class schedule for scheduled times); the third examination will be given during the final examination period.

	Undergraduate	Graduate	Grading	Percent
First Exam	20% of overall grade	20% of overall grade	A	90-100%
Second Exam	20% of overall grade	20% of overall grade	B	80-89%
Third Exam	20% of overall grade	20% of overall grade	C	70-79%
Take-Home Assignments	4% each (40% total)	2% each (20% total)	D	60-69%
Graduate Project		20% of overall grade	E	below 60%
TOTAL:	100%	100%		

Assignments:

There will be eleven (11) assignments to be completed on BlackBoard®, ten (10) of which will be counted towards the final grade (i.e., the worst score will be dropped). You may access the assignments via BlackBoard® with your ASURITE ID and password. ASU offers computer access to

all students, but you may use your computer to complete the assignments via the internet. The assignments are timed and they should be completed in one session (i.e., you cannot write return to the test once it timed you off or once you logged off). You will also be provided with practice activities that allow ample preparation for the assignments, so you are encouraged to complete the practice activities first, and do the assignments after you have had practice.

Graduate Project (SHS 598; GRADUATE SECTION ONLY):

Students registered for graduate credit must complete a graduate project. The description of the project will be provided as scheduled. You may not present work you previously submitted to another class in the past, or to another class you are currently taking. Copying your own work **is** considered plagiarism. If you refer to your earlier work, you need to cite it using APA style.

Plagiarism:

To plagiarize is to fail to give due credit to existing work (including your own). This includes (but is not limited to) cheating on exams, turning in someone else's paper, neglecting to name co-authors, turning in your own work submitted elsewhere, et cetera. Plagiarism of all or a portion of any assignment (including cheating on a test, exam, or quiz) will not be accepted. Plagiarism may result in a failing grade for the entire course and may result in dismissal from the program in Speech and Hearing Science. Any work should represent your **INDIVIDUAL WORK**, unless it is noted otherwise. When only a portion of an activity requires cooperation with others, the rest of the assignment must reflect **individual** work. Any group projects have to be approved by the instructor prior to their execution; otherwise, they will not be accepted for credit.

Attendance and Participation:

Because a considerable amount of our learning will take place in class, you are expected to attend class. "Attendance" means being present on time and prepared for the entire class period. Your presence is especially crucial on the date of each exam and when an assignment is due. Should you be absent on the day of an exam or when an assignment is due, **proper documentation has to be provided so that you may complete the work for credit**. Each case of missed coursework will be handled on an individual basis. Late assignments may not be accepted.

Withdrawal/Incomplete:

Please read the *ASU Academic Calendar* or the *Schedule of Classes* for details. The Final Drop/Add Periods are **January 17 -21, 2005 (in person)** and **January 17-23, 2005 (SunDial & ASU Interactive)**, and the Course Withdrawal Deadline is **April 1, 2005 (in person)** and **April 3, 2005 (SunDial & ASU Interactive)**. As the *Schedule of Classes* notes, all dates are tentative and are subject to change **by ASU** without notice.

NOTE:

If you are a student who requires special accommodations, please contact Disability Resources for students at (480) 965-1234 (voice), (480) 965-9000 (TDD), Disability-Q@asu.edu (e-mail), or visit <http://www.asu.edu/drs/>. Please feel free to discuss special accommodations you may need with the instructor.

Course Schedule and Topic Outline

NOTES:

Please note that the course schedule (outlined below) **may change**.

You have to bring a set of earphones to class (EVERY SESSION).

The readings and the work you are expected to do for the respective session are italicized. The readings tasks need to be completed before class.

BHR refers to the textbook.

Sensimetrics refers to the *Speech Production and Perception I* CD.

Handout/packet refers to information that was distributed in class and/or information available via our course web page.

“Skim” means you should understand the reading, but close reading may not be essential **at that time**. The Sensimetrics CD should be used interactively.

“Read” means you may be requested to recall specific information. All handouts and the information contained in the course packet should be read carefully even though it.

1/17/05	Martin Luther King’s Day, class excused
1/19/05	Introduction (<i>read syllabus; work with speech analysis programs</i>)
1/24/05	Computerized recording, and working with audio files (<i>handout/packet</i>)
1/26/05	Digitizing sound (<i>handout/packet, BHR: read pp. 206-214</i>)
1/31/05	Graphical representation of speech (<i>handout/packet, BHR: read pp. 206-214, Sensimetrics: under Activities, Spectrograms, go through Why We Make Spectrograms & Going from Spectra to a Spectrogram</i>) ASSIGNMENT 1 DUE
2/2/05	Anatomy: systems of speech production (<i>handouts/packet; BHR: skim pp. 52-63</i>), the vocal Folds (<i>handouts/packet; BHR: skim pp. 64-79</i>)
2/7/05	Anatomy: laryngeal muscles (<i>handouts/packet; BHR: skim pp. 64-79</i>), the supralaryngeal system (<i>handouts/packet; BHR: skim pp. 81-88</i>) ASSIGNMENT 2 DUE
2/9/05	The laryngeal output and pitch (<i>BHR: skim pp. 23-29, and read pp. 30-38 & 72-78</i>); <i>work with audio files</i>
2/14/05	First examination
2/16/05	Laryngeal output, resonance and the transfer function (<i>BHR: skim pp. 23-29, and read pp. 30-38 & 72-78</i>)
2/21/05	Resonance and transfer function of the vocal tract (<i>BHR: re-read pp. 30-38, and read pp. 39-40 & 81-88; Sensimetrics: under Activities, Spectrograms, go through Bandwidths</i>) ASSIGNMENT 3 DUE
2/23/05	Vowels: characteristics, source, filter, and formants (<i>BHR: read pp. 89-100; Sensimetrics: under Activities, go through Vowel Acoustics</i>)
2/28/05	Vowels: potential cues to vowel identification (<i>BHR: pp. 159-162; Sensimetrics: under Activities, Speech Perception, go over What is an Acoustic Cue?, under Activities, Vowel Perception, go over Phonetic and Perceptual Information & Normalization</i>) ASSIGNMENT 4 DUE
3/2/05	Vowels: theories of vowel perception, (<i>BHR: re-read pp. 85-100, and read 118-121</i>) ASSIGNMENT 5 DUE

3/7/05 – 3/9/05	CLASS CANCELLED
3/13-3/20	Spring break
3/21/05	Vowels: perception and activities
3/23/05	Consonants: introduction and stops (to manner cues for stops) (<i>BHR: read pp. 111-116, 164-169, & 171-172; Sensimetrics: under Activities, Consonant Acoustics, go through Aerodynamic Effects & Degree of Constriction</i>) ASSIGNMENT 6 DUE
3/28/05	Second examination
3/30/05	Consonants: stop place of articulation (<i>BHR: pp. 111-116, 164-169, & 171-172; Sensimetrics: under Activities, Consonant Acoustics, go through Place of Articulation</i>)
4/4/05	Consonants: stop voicing (<i>BHR: pp. 111-116, 164-169, & 171-172; Sensimetrics: under Activities, Consonant Acoustics, go through Voicing</i>) ASSIGNMENT 7 DUE
4/6/05	Consonants: fricatives and affricates (<i>BHR: pp. 106-111, 116-117, & 169-172; Sensimetrics: under Activities, review Consonant Acoustics</i>)
4/11/05	Consonants: fricatives and affricates (<i>BHR: pp. 106-111, 116-117, & 169-172; Sensimetrics: under Activities, review Consonant Acoustics</i>) ASSIGNMENT 8 DUE
4/13/05	Consonants: liquids and glides (<i>BHR: pp. 101-103, 162-163, & 171-172; Sensimetrics: under Activities, review Consonant Acoustics</i>)
4/18/05	Consonants: nasals (<i>BHR: pp. 103-106, 162-164, & 171-172; Sensimetrics: under Activities, Consonant Acoustics, go over Nasalization, and review the rest of Consonant Acoustics</i>) ASSIGNMENT 9 DUE
4/20/05	Various acoustic measurements
4/25/05	Presentations; Graduate Project Due
4/27/05	Presentations; ASSIGNMENT 10 DUE
5/2/05	Review and summary REPLACEMENT ASSIGNMENT DUE
5/10/05	Final (3rd) Examination; Tuesday, 5/10/05, from 10:00 to 11:50 am in COOR L1-38

Student Outcomes: Speech Science (SHS 375/598)

Student Name: _____ Date: _____

Yes = Competency met by achieving 80% or better (or 70% or better for undergraduates) on the test.
 No = Competency not demonstrated. Student scored lower than 80% (or lower than 70% for undergraduates) on the test. Student will need to demonstrate this competency elsewhere (e.g., repeating the class).

The student is able to:

Knowledge or Skill	Measure(s)	Met? (Date)	Remediated? (Date)
(III – B) Know basic aspects of acoustic analyses of speech, digital versus analog signals, graphical analyses of speech, and understand the basic biology of the speech production mechanism.	First Examination		
(III-B) Understand the acoustic properties of the laryngeal output, resonance and the transfer function of the vocal tract. Know the acoustic characteristics of vowels and theories of vowel perception.	Second Examination		
(III-B) Be familiar with the acoustic properties of consonants, and know the perceptual acoustic cues to consonant identification in American English.	Third Examination		

Instructor's Name: Michael Dorman Signature: _____

*Make a copy for the student and send original to the Department to be placed in the student's file.