LINGUISTICS 512: PHONETICS

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CTools Course Site: LING 512 001 F08

This course introduces students to the nature of human speech production and perception and the nature of the acoustic signal that is transmitted from speaker to listener. The course goals are: (1) To understand fundamental principles of phonetic theory and phonetic representation. We will study current theories of the complex tasks accomplished by speakers and listeners and will arrive at a representation of speech sounds in terms of their articulatory (speaker-based), acoustic, and perceptual characteristics. (2) To introduce students to phonetic experimentation and modeling. Small-scale experiments will provide training in physiologic measurement, acoustic analysis, and perceptual testing, and reinforce theoretical principles by serving as empirical tests of selected claims. (3) To consider the relation between human articulatory and perceptual capacities and patterns in linguistic sound systems (i.e., phonology). Our exploration of issues related to this third goal will necessarily be preliminary, serving as a bridge between phonetics and future coursework that many students will take in phonology. (4) To provide practical experience in producing and transcribing sounds of the world's languages.

READINGS

Texts (available at Shaman Drum):

Johnson, Keith. 2003. *Acoustic & Auditory Phonetics*. 2nd ed. Blackwell Publishing.

Ladefoged, P. 2006. *A Course in Phonetics*. 5th ed. Thomson Wadsworth.

Additional required readings (on or linked to the CTools site):

(1) Keating 1990
(2) Bell-Berti & Krakow 1991
(3) Strange 1999
(4) Diehl, Lotto, & Holt 2004
(5) Raphael et al. 2007
(6) Liberman & Mattingly 1985
(7) Ohala 1981

Excellent resources for all students of linguistic phonetics:

Raphael, L., Borden, G., Harris, K. 2007. *Speech Science Primer*. 5th edition. Lippincott Williams & Wilkins.

Ladefoged, P. & Maddieson, I. 1996. *The Sounds of the World's Languages*. Blackwell.

REQUIREMENTS

1. In-class acoustics exam (Tues, Oct. 28): 15%
2. Comprehensive take-home final exam (due Tues Dec. 16, 4:00 pm): 25%
3. Lab assignments: 20%
4. Dictations (4) and production exam: 15%
   (Make-up dictations will not be given, except in extraordinary circumstances.
   Lowest of the 5 dictation + production scores will be dropped.)
5. Term project/paper (due Tues, Dec. 2): 20%
6. Participation: 5%

COURSE-RELATED TOOLS

1. Course website. The CTools (www.ctools.umich.edu) website for the course will be used for posting announcements, handouts, copies of daily lecture notes, and sound files. Students should log on to the website frequently (minimally, the day before class, but more often will likely be necessary, especially as the term progresses). Please let me know if you have any questions about the site, or run into any difficulties using it.
2. Praat: The acoustic analysis program that we'll be using, Praat, is available on the computers in the Linguistics Computer Classroom and is downloadable from http://www.fon.hum.uva.nl/praat/. You will generally have access to the Linguistics Computer Classroom during most hours when classes are not being held in that room. Praat and other phonetics software are also on the Macs in the Phonetics Lab.
3. Transcription practice. Audio files providing aural practice for transcribing the speech sounds covered in the course are available through the course CTools site. Please note that the website also includes a *transcription* (pdf file) of all of the practice "drills"; you will need the transcription to verify that what *you* transcribe corresponds to what was *actually said* in the audio file!

PHONETICS LABORATORY

The department has a state-of-the-art phonetics laboratory. For physiologic measures, the lab has a (1) portable ultrasound system for imaging tongue body movement during continuous speech, (2) pneumotachograph for measuring oral and nasal airflow, and (3) electroglottograph for studying laryngeal function. For acoustic and perceptual studies, the lab has high-quality recording equipment, several acoustic analysis packages, Klatt speech synthesis, and software and hardware for running a wide range of perceptual tests. Most data are collected in the new sound room in 400 Lorch.

LING 512 SYLLABUS

AAP = Johnson's *Acoustic & Auditory Phonetics*; CIP = Ladefoged's *A Course in Phonetics*
Readings to accompany SOWL (sounds of the world's languages) labs: relevant sections of CIP Chs. 6, 7, and 9.

DAY	**TOPIC (READINGS)**
Tu 9/2	Introduction
Th 9/4	Production: Initiation (CIP Ch 6, pp. 133-143)
Lab 1:	Introduction to PRAAT: Measuring voice onset time
Tu 9/9	Production: Phonation (CIP Ch 6, pp. 143-152)
Th 9/11	Production: Consonantal articulations (CIP Chs 1-3; Ch. 7); **Lab Exercise I due**
Lab 2:	Using ultrasound to investigate tongue body movement
Tu 9/16	Production: Vowels (CIP Ch 4; Ch. 9, pp. 211-216 & 223-227)
Th 9/18	Production: Hierarchical organization (CIP Ch 5, pp. 107-111 & 116-124; Ch 10 pp. 237-244)
Lab 3:	Measuring oral/nasal airflow
Tu 9/23	Production: Models of coarticulation I (Keating 1990; Krakow & Bell-Berti 1991)
Th 9/25	Production: Models of coarticulation II
Lab 4:	Sounds of English and **DICTATION 1**
Tu 9/30	Basic acoustics (AAP Ch 1; Ch 5 pp. 79-82); **Lab Exercise II due**
Th 10/2	Acoustic phonetics: Acoustics of the vocal tract (AAP Ch 5, omit 97-100)
Lab 5:	SOWL: Pure vowels [i e o u]; voiceless unaspirated stops [p t k]; breathy voiced stops [b̤ʱ d̤ʱ gʱ]; velar fricatives [x ɣ]; bilabial fricatives [ɸ β]; labio-velar fricative [ʍ]
Tu 10/7	Acoustic phonetics: Vowel spectra (AAP Ch 6)
Th 10/9	Acoustic phonetics: Digital signal processing (AAP Ch 2; Ch 5 pp. 97-100); **Project Report 1 due** (see Term Project under "Resources")
Lab 6:	SOWL: Palatal consonants [c ɟ ç ʝ ɲ]; ejectives [p' t' k']; implosives [ɓ ɗ ɠ]; clicks [ʘ ǀ ǁ ! ǂ]
Tu 10/14	Acoustic phonetics: Acoustics of obstruents (AAP, Chs 7-8); **Lab Exercise III due**
Th 10/16	Acoustic phonetics: Acoustics of sonorants and more (AAP Ch 9)
Lab 7:	SOWL: Practice and **DICTATION 2**
(Tu 10/21	Fall break)
Th 10/23	Catch-up and review; **Lab Exercise IV due**
Lab 8:	SOWL: Trills [ʙ r ʀ]; flaps [ɾ ɽ ɺ]; uvular consonants [q ɢ χ ʁ ɴ]
Tu 10/28	**ACOUSTICS EXAM**
Th 10/30	Basic audition and psychoacoustics (AAP Ch 3)
Lab 9:	SOWL: Front rounded vowels [y ø œ]; back unrounded vowels [ɯ ɤ ɑ]; laterals [ɬ ɮ ʎ ʟ]

Tu 11/4	Perception: The task of speech perception research (Diehl et al. 2004)
Th 11/6	Perception: Vowel perception (Strange 1999)
Lab 10	SOWL: Practice and **DICTATION 3**
Tu 11/11	Perception: Perceptual experimentation
Th 11/13	Perception: Categorical perception (Diehl et al. pp. 155-159; Raphael et al. pp. 237-249)
Lab 11	SOWL: Nasal Vs [ĩ ẽ æ̃ ɑ̃ õ ũ]; prenasalized stops [ᵐb ⁿd ᵑg]**;** retroflex Cs [ʈ ɖ ʂ ʐ ɭ]; dental Cs [ç]; pharyngeal fricatives [ħ ʕ] **Project Report 2 due**
Tu 11/18	Perception: Perceptual Compensation (Diehl et al. 160-64) **Lab Exercise V due**
Th 11/20	Perception: Theories of perception I (Diehl et al. 2004)
Lab 12	SOWL: Secondary and double articulations
Tu 11/25	Perception: Theories of perception II (Diehl et al. 2004); **This week: Production exam**
(Th 11/27	Thanksgiving)
Tu 12/2	Phonetics-phonology relation I (Ohala 1981); **Term project due**
Th 12/4	Phonetics-phonology relation II
Lab 13	Practice and **DICTATION 4**
Tu 12/9	Presentation of term projects
Tu 12/16	**TAKE-HOME FINAL EXAM** due 4:00 pm