

LINGUISTICS 512: PHONETICS

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Office Hour: Tu 11:30-12:30 and by appointment

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Phonetics Lab (Sound Room): 400 Lorch

Canvas Course Site: LING 512 001 FA 2021

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 to:

- Understand fundamental principles of phonetic variation and phonetic theory. We will study the lawful but highly variable properties of speech signals. We will also study current theories of how speakers coordinate articulatory movements to give rise to these structured signals and how listeners use the variable information to determine what speakers are saying.
- Introduce students to phonetic experimentation and modeling. Small-scale experiments will provide training in analyzing speech signals and perceptual testing, and will reinforce theoretical principles by serving as empirical tests of selected claims.
- Consider the relation between the physical instantiation of speech and its cognitive representation. Our exploration of this issue will ideally serve as a bridge between phonetics and future coursework that many students will take in phonology.
- Provide practical experience in producing and transcribing sounds of the world's languages.

READINGS

*Texts:* Johnson, K. 2011. *Acoustic & Auditory Phonetics*. 3<sup>rd</sup> ed. Blackwell Publishing.

Ladefoged, P. & Johnson, K. 2014. *A Course in Phonetics*. 7<sup>th</sup> ed. Wadsworth Cengage Learning.

(Note: The 5<sup>th</sup> and 6th editions of this text would work equally well for this course.

The author of the 5<sup>th</sup> edition is P. Ladefoged.)

Additional readings are on the Canvas site.

*Excellent resources for all students of linguistic phonetics:*

Raphael, L., Borden, G., Harris, K. 2011. *Speech Science Primer*. 6<sup>th</sup> edition. Lippincott Williams & Wilkins.

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

REQUIREMENTS

In-class acoustics exam	15%
Comprehensive take-home final exam	20%
Lab assignments	25%
Dictations (4) and production exam (lowest of these 5 scores will be dropped)	15%
Term project/paper	20%
Participation	5%

COURSE-RELATED TOOLS

- The Canvas website is used for posting announcements, lab exercises and other handouts, lecture notes, non-textbook readings, sound files, and more.
- The acoustic analysis program that we're using, Praat, is available on the computers in our classroom and is downloadable from <http://www.fon.hum.uva.nl/praat/>.

- Audio files providing aural practice for transcribing the speech sounds covered in the course are on Canvas. Note: the website also includes a *transcription* (pdf file) of all practice "drills"; you will need the transcription to verify that what *you* transcribe corresponds to what was *actually said* in the audio file.
- Among the many websites that you may find useful for this course are:
  - A *Course in Phonetics* (7<sup>th</sup> ed): <http://linguistics.berkeley.edu/acip/>
  - A *Course in Phonetics* (5<sup>th</sup> ed): <http://www.phonetics.ucla.edu/course/contents.html>
  - USC's database of MRI movies of real-time speech: <https://sail.usc.edu/span/usc-timit/index.html>
  - IPA chart with downloadable symbols: <http://westonruiter.github.io/ipa-chart/keyboard/>

#### PHONETICS LABORATORY

The department's articulation labs have two electromagnetic articulographs for capturing articulator movements, a portable ultrasound system for imaging tongue body movement, an oral/nasal airflow system for studying speech aerodynamics, and an electroglottograph for studying laryngeal function. Our acoustics and perception lab has two eyetracking systems for studying the time course of speech perception, recording equipment, and software and hardware for conducting a wide range of perception experiments.

#### CLASS DISCUSSIONS

We want to create an atmosphere of mutual respect in which we recognize that we all bring relevant expertise and experiences to the course and are learning from each other. In our discussions, different viewpoints will arise. We will want to respect others' rights to hold opinions and beliefs that differ from our own, to listen carefully to what they are saying, and to comment in ways that reflect that we have paid attention to the speaker's comments. When we disagree, let's take care to challenge the idea, not the person. In this course, we are also honing our skills as scientists, making it especially important to support our statements with evidence and to provide a rationale for our position.

Although we all have a responsibility to come to class prepared and willing to share, we also have different comfort levels with sharing our ideas. Please be aware of different communication styles, look for ways to expand your communication tool kit, and try to share responsibility for including all voices in the discussion.

#### OTHER IMPORTANT INFORMATION

- You are expected to adhere to the required safety measures and guidelines of the State of Michigan and U-M. These include wearing a face covering that covers the mouth and nose in class, and not coming to class when ill or in quarantine. Students seeking to request an accommodation related to the face covering requirement under the Americans with Disabilities Act should contact the [Office for Institutional Equity](#).
- I am committed to providing equal opportunity for participation in all aspects of this course. If you think you need an accommodation for a disability, please let me know at your earliest convenience. Also, requests for accommodations may be made by contacting the Services for Students with Disabilities (SSD) Office located at G664 Haven Hall (734-763-3000). The SSD Office typically recommends accommodation through a Verified Individualized Services and Accommodations (VISA) form.
- Students may experience stressors that can impact both their academic experience and their personal well-being. These may include academic pressures and challenges associated with relationships, mental health, alcohol or other drugs, identities, finances, etc. If you are experiencing concerns, seeking help is a courageous thing to do. If the source of your stressors is academic, please contact me so that we can find solutions together. For personal concerns, U-M offers a variety of resources, many which are listed on the [Resources for Student Well-being](#) webpage. You can also search for additional well-being resources [here](#).
- All students are expected to be aware of the Rackham Graduate School's and the College of LSA's standards of academic integrity. If you have any questions, please talk to me.
  - <http://www.rackham.umich.edu/current-students/policies/academic-policies/section11>
  - <https://lsa.umich.edu/lsa/academics/academic-integrity.html>
  - <https://www.lib.umich.edu/academic-integrity>

## TENTATIVE SYLLABUS

AAP = Johnson's *Acoustic & Auditory Phonetics*, 3<sup>rd</sup> ed

CIP = Ladefoged & Johnson's *A Course in Phonetics*, 7<sup>th</sup> ed [in brackets: pages for 6<sup>th</sup> and 5<sup>th</sup> editions]

Readings to accompany SOWL (sounds of the world's languages) labs: relevant sections of CIP Chs. 6, 7, and 9.

DATE	TOPIC	READINGS/LABS
Tu 8/31	Introduction	
Th 9/2	Production: vocal tract anatomy, gestures	MRI movies of speech production <a href="https://www.youtube.com/watch?v=LgkbvkCS3I&amp;index=3&amp;list=PLH58B6RxHU0XeJ1nMIOcB4PFZRCAWLWL">https://www.youtube.com/watch?v=LgkbvkCS3I&amp;index=3&amp;list=PLH58B6RxHU0XeJ1nMIOcB4PFZRCAWLWL</a>
Lab 1	Principles of transcription	CIP Ch. 2
Tu 9/7	Production: Initiation	CIP Ch 6, pp. 144-155 [136-147; 133-143]
Th 9/9	Production: Phonation	CIP Ch 6, pp. 156-165 [148-157; 143-152]; Raphael et al., pp. 69-81
Lab 2	Introduction to PRAAT: Measuring voice onset time	
Tu 9/14	Production: Consonants (especially of English)	CIP Chs 1, 3, and 7
Th 9/16	Production: Vowels (especially of English)	CIP Ch 4; Ch. 9, pp. 227-232 [217-222; 211-216] & 238-242 [228-232; 223-227] <b>Lab Exercise I due</b>
Lab 3	Using ultrasound to investigate tongue movement	
Tu 9/21	Production: Theories of speech production	Browman & Goldstein 1992 (especially pp. 155-171)
Th 9/23		
Lab 4	Sounds of English and <b>DICTATION 1</b>	
Tu 9/28	Basic acoustics	AAP Ch 1; Ch 2 pp. 25-28 <b>Lab Exercise II due</b>
Th 9/30	Acoustic phonetics: Acoustics of the vocal tract	AAP Ch 2
Lab 5	SOWL: Pure vowels [i e o u]; voiceless unaspirated [p t k] and breathy voiced [b <sup>h</sup> d <sup>h</sup> g <sup>h</sup> ] stops; velar [x ɣ] and bilabial [ɸ β] fricatives; labio-velar fricative [ɱ]	
Tu 10/5	Acoustic phonetics: Vowel spectra	AAP Ch 6
Th 10/7	Acoustic phonetics: Digital signal processing	AAP Ch 3
Lab 6	SOWL: Palatals [c ɟ ç ʝ ɲ]; ejectives [p' t' k']; implosives [ɓ ɗ ɠ]; clicks [ǀ ǁ ǃ ǂ]	<b>Term paper:</b> Email me about the language you've chosen (Option A) or arrange to meet with me if you're choosing Option B.
Tu 10/12	Acoustic phonetics: Acoustics of obstruents	AAP, Chs 7-8 <b>Lab Exercise III due</b>
Th 10/14	Acoustic phonetics: Acoustics of sonorants	AAP Ch 9
Lab 7	SOWL: Practice and <b>DICTATION 2</b>	

DATE	TOPIC	READINGS/LABS
Tu 10/19	FALL BREAK	
Th 10/21	Catch-up and review	<b>Optional Lab Exercise IV due</b>
Lab 8	SOWL: Trills [ʙ ʀ ʁ]; flaps [ɾ ɽ ɺ]; uvulars [q ɢ χ ʁ ɴ]	
Tu 10/26	<b>ACOUSTICS EXAM</b>	
Tu 10/28	Hearing and psychoacoustics	AAP Ch 4
Lab 9	SOWL: Front rounded [y ø œ] and back unrounded [ɯ ʏ ɑ] vowels; laterals [ɬ ʎ ʌ ɭ]	
Tu 11/2	Perception: Acoustic variability and perceptual constancy	<i>Optional: Beddor 2017, pp. 1-7</i>
Th 11/4	Perception: Categorical perception	Diehl et al. 2004, pp. 155-159 <i>Optional: Raphael et al. pp. 222-234</i>
Lab 10	SOWL: Practice and <b>DICTATION 3</b>	
Tu 11/9	Perception: Malleable perception	
Th 11/11	Perception: Motor theory	Lieberman & Mattingly 1985
Lab 11	SOWL: Nasal vowels [ĩ ẽ æ ã õ ü]; retroflex [ɽ ɖ ʂ ʐ] and dental [ɟ] consonants; pharyngeal fricatives [ħ ʕ]	<b>Paper option A: parts 1 &amp; 2 due</b> <b>Paper option B: topic statement due</b>
Tu 11/16	Perception: Direct Realism	Fowler 1996 <b>Lab Exercise V due</b>
Th 11/18	Perception: Gestural vs. auditory theories and compensation for coarticulation	Diehl et al. 2004, pp. 160-164 <b>This week: production exam</b>
Lab 12	SOWL: Practice and <b>DICTATION 4</b>	
Tu 11/23	Perception: Integrating social and linguistic information; exemplar theories	<i>Optional: Beddor 2017, pp. 9-11</i>
Th 11/25	THANKSGIVING	
Tu 11/30	Phonetics of sound change or sociophonetics (depending on student interests)	Reading TBD
Th 12/2		<b>Term papers due</b>
Lab 13	SOWL: Tones; secondary and double articulations	
Tu 12/7	Pulling it all together	
Tu 12/9	Student presentation of term projects	
Tu 12/14	<b>TAKE-HOME FINAL EXAM due 4 pm</b>	