

LSCI 119/219: Introduction to Acoustic Phonetics

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Lecture times: MWF 10am-10:50am

Lecture Zoom: <https://uci.zoom.us/j/94709301768>

Office Hours: M 11am-12pm

Office Hours Zoom: <https://uci.zoom.us/my/cjmayer>

Website: <https://canvas.eee.uci.edu/courses/42277>

Course Description

This course is an introduction to acoustic phonetics: the study of the acoustic properties of speech and their relationship to speech articulation and speech perception.

You should come out of this course able to:

- Describe the basic articulatory properties of a range of speech sounds
- Transcribe speech sounds using the International Phonetic Alphabet
- Use Praat to produce quantitative acoustic measurements of speech
- Interpret acoustic measurements of speech sounds and their relation to speech articulation and perception
- Plan and carry out experiments using acoustic phonetic analysis, basic hypothesis testing, data analysis, and presentation skills

Course Format

Lectures and office hours for this class will primarily be held over Zoom. We may have occasional in-person lectures or office hours as appropriate.

You are *strongly* encouraged to attend lectures at the scheduled times so you can ask questions. Classes on Fridays will typically include a practical lab component, so synchronous attendance of those lectures will be particularly valuable.

Lectures will be recorded and uploaded to Canvas. Only the instructor will be able to record lectures, and lectures will only be accessible to members of the class via Canvas. For more information on UCI's Zoom privacy policies, see <https://sites.uci.edu/learnanywhere/zoom-recording-privacy/>. Please let the instructor know if you have any specific privacy concerns.

Prerequisites

Students should have taken LSCI 3. Basic familiarity with the International Phonetic Alphabet is assumed.

Course Materials

Readings

You do not need to purchase any textbooks for this course. All materials (assignments, notes, readings) will be distributed through the course website on Canvas.

Readings will come from Peter Ladefoged and Keith Johnson's *A course in phonetics* (7th edition) and Keith Johnson's *Acoustic and auditory phonetics* (3rd edition). Supplementary material for *A course in phonetics* can be found at <https://linguistics.berkeley.edu/acip/>.

Software

You will need access to a spreadsheet program of some kind (Excel, LibreOffice, Google Sheets, etc.) and the phonetic analysis software Praat (<https://www.fon.hum.uva.nl/praat/>).

Requirements and grading

There are two grading options available for students. Graduate students are required to take the project-and-exams option, while undergraduates can choose either one.

Exam-only

| Component | Proportion of grade |
|--------------------------|---------------------|
| Weekly online quizzes | 5% |
| Three homework exercises | 45% |
| Midterm exam | 20% |
| Final exam | 30% |

Project-and-exams

| Component | Proportion of grade |
|--------------------------|---------------------|
| Weekly online quizzes | 5% |
| Three homework exercises | 45% |
| Midterm exam | 10% |
| Final exam | 20% |
| Final project | 20% |

Weekly online quizzes

There will be eight short weekly online quizzes distributed on Canvas that will be due on the Monday of Weeks 2–10, excluding Week 6 when the midterm is due. The aim of these is to keep you engaged with the course material and to check your understanding of material from the previous week. **No late submissions of online quizzes will be accepted.**

Homework exercises

The course grade will be calculated based on three equally-weighted homework exercises (15% each). These will include tasks such as transcribing speech sounds, annotating acoustic recordings and making quantitative measurements, and analyzing acoustic data.

Students are permitted (encouraged, even!) to collaborate on homework exercises, but **you must hand in your own assignment that is reflective of your own understanding**: no direct copies or jointly authored assignments are allowed. If you do collaborate, please list at the top of your assignment all of the people you've collaborated with.

Exercises can be turned up to 7 days late. 10% of your score will be deducted for each 24 hours of lateness (rounded up). For example, if an assignment is worth 100 points, you turn it in two days late, and earn an 80 before lateness is taken into account, your score will be $(1 - 0.2) * 80 = 64$.

Midterm and final exams

There will be a take-home midterm due in Week 6 and a take-home final during exam week. The midterm will be distributed at the end of class on Friday 2/4 and will be due at the beginning of class on Monday 2/7. The final exam will be distributed at the end of class on Friday 3/11, and will be due by the end of the day on Monday 3/14. The final exam will be cumulative. **Please do not collaborate on the exams.**

Final project

Graduate students are required to do a final project. Undergraduate students have the option to do so. It will be due at the end of exam week.

The project should consist of a small pilot experiment and write-up that address a specific research question and hypothesis. We will discuss this in more detail in class.

If you are interested in doing a final project, **please email me by the end of Week 7 with a brief description of your proposed project.**

Grading policies

Letter grades are calculated from numeric grades as follows:

| Numeric grade | Letter grade |
|---------------|--------------|
| $\geq 90\%$ | A |
| $\geq 80\%$ | B |
| $\geq 70\%$ | C |
| $\geq 60\%$ | D |
| $< 60\%$ | F |

Grades will only be changed for clerical or arithmetic errors. The exception to this is that I reserve the right to scale final grades if I think it is necessary. I will only scale grades up: that is, your final grade can only *improve* as the result of scaling.

Getting help

- The first place you should seek help is using the discussion board on Canvas. If you have a question, it's likely that someone else has the same question. Posting on the discussion board allows everyone to see the answer. I also strongly encourage you to try to answer your peers' questions on the discussion board. This gives you valuable practice engaging with the course material, utilizing online resources, and synthesizing information, all of which will serve you well down the road.
- The second place you should come for help is my office hours. Please feel free to drop by as frequently as you like, even if you don't have any specific questions and you just want to work on an exercise or chat.
- If neither the discussion board or office hours are viable, you can email me with questions or concerns. I will reply to you within 24 hours.
- In certain circumstances I may be willing to arrange a meeting with you outside of normal class times and office hours. For the sake of my schedule (and yours!), please consider this a last resort, and do your best to seek help using the resources in the previous three points.

Academic integrity

All students are expected to adhere to the UCI Academic Dishonesty Policies (for more information, please visit <https://aisc.uci.edu/students/academic-integrity/index.php>).

Disability

Any student requesting academic accommodations based on a disability is required to apply with Disability Service Center at UCI. For more information, please visit <http://disability.uci.edu/>.

Course Schedule

Reading key:

- **L&J:** Peter Ladefoged and Keith Johnson's *A course in phonetics (7th edition)* (supplementary material: <https://linguistics.berkeley.edu/acip/>)
- **J:** Keith Johnson's *Acoustic and auditory phonetics (3rd edition)*

| Week | Dates | Topic | Readings | Deadlines |
|------|-------------|--|----------------------------|---|
| 1 | 1/3 – 1/7 | Speech production | L&J Ch. 1 | |
| 2 | 1/10 – 1/14 | Phonetic transcription and the IPA | L&J Ch. 2 | Quiz 1 (1/10) |
| 3 | 1/17 – 1/21 | Digitization, waveforms, spectrograms | J Chs. 1, 3.1–3.2 | Quiz 2 (1/19) |
| 4 | 1/24 – 1/28 | Segmentation and duration Source-Filter theory | J Chs. 7.1, 8.1 J Ch. 2 | Quiz 3 (1/24) |
| 5 | 1/31 – 2/4 | Vowel acoustics and analysis Basic experimental design and analysis | J Ch. 6 | Quiz 4 (1/31) Exercise 1 (1/31) |
| 6 | 2/7 – 2/11 | Vowel formants, vowel spaces | J Ch. 3.3 | Midterm (2/7) |
| 7 | 2/14 – 2/18 | Consonant acoustics, constrictions Phonation types | J Chs. 7, 8, 9 | Quiz 5 (2/14) Exercise 2 (2/18) |
| 8 | 2/21 – 2/25 | Tones, prosody | L&J Ch. 10 | Quiz 6 (2/21) |
| 9 | 2/28 – 3/4 | Audition, perceptual cues | J Chs. 4, 5 | Quiz 7 (2/28) |
| 10 | 3/7 – 3/11 | More perception, summary and review Instrumental phonetics | | Quiz 8 (3/7) Exercise 3 (3/11) |
| 11 | 3/14 – 3/18 | Exam week | | Final Exam (3/14) Final Paper (3/18) |

Acknowledgments

The overall structure of this course owes much to Pat Keating's LING 104/204 at UCLA. Pat taught me much of what I know about acoustic phonetics, and her impact on me is reflected here!