LSCI 117/217: Introduction to Acoustic Phonetics

Spring 2025

Lecture time: MWF 10am–10:50am
Lecture location: ALP 2700

Lab time: F 11am–11:50am
Lab location: SST 107

Website: https://canvas.eee.uci.edu/courses/73294

Instructor: Connor Mayer
Student hour time: W 3–4pm
Student hour location: SSPB 2211

E-mail: cjmayer@uci.edu

TA: Charles Torres
Student hour time: T 1–2pm
Student hour location: SSPB 2229

E-mail: charlt4@uci.edu

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
- Use JASP to do basic data visualization and statistical analysis

Course Format

Lectures and student hours for this class will primarily be held in person. We may have occasional Zoom meetings as necessary.

Attendance at lectures will not be graded. However, you are *strongly* encouraged to attend lectures at the scheduled times so you can ask questions. If you are unable to attend lectures due to illness or other extenuating circumstances, you can access recordings of the lectures on Canvas. Lectures will be recorded live, and the recordings may not be optimal quality.

There will be weekly in-person labs. These will consist of a tutorial that works through a specific task using Praat or JASP. Labs are not graded, but they are crucial for getting hands on practice using Praat and JASP. Content from the labs may be included on the weekly quiz.

Prerequisites

Students should have taken LSCI 3 and LSCI 10. 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 the phonetic analysis software Praat (https://www.fon.hum.uva.nl/praat/) and the statistical analysis software JASP (https://jasp-stats.org/).

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 quizzes	10%
Five homework exercises	50%
Midterm exam	15%
Final exam	25%

Project-and-exams

Component	Proportion of grade
Weekly quizzes	10%
Five homework exercises	50%
Midterm exam	10%
Final exam	15%
Final project	15%

Weekly quizzes

There will be eight short in-class weekly quizzes in Weeks 2–10, excluding the week of the midterm (Week 6). Quizzes will be on the Monday of each week, except for Week 9 when it will be on Wednesday due to a holiday Monday. 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 quizzes will be accepted.** These quizzes may include content relevant to that week's lab materials.

Homework exercises

The course grade will be calculated based on five equally-weighted homework exercises (10% 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 an in-class midterm administered during Week 6 and a final exam during exam week. The final exam will be cumulative.

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 student 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 student 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 student 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	3/31 – 4/4	Transcription and the IPA	L&J Ch. 1-2	
2	4/7 – 4/11	Speech production	L&J Ch. 3-4	Quiz 1 (4/7)
3	4/14 – 4/18	Digitization, waveforms, spectrograms	J Chs. 1, 3.1–3.2	Quiz 2 (4/14) Exercise 2 (4/14)
4	4/21 – 4/25	Segmentation and duration Source-Filter theory	J Chs. 7.1, 8.1 J Ch. 2	Quiz 3 (4/21)
5	4/28 – 5/2	Vowel acoustics and analysis Basic experimental design and analysis	J Ch. 6	Quiz 4 (4/28) Exercise 2 (4/28)
6	5/5 – 5/9	Vowel formants, vowel spaces	J Ch. 3.3	Midterm (5/5)
7	5/12 – 5/16	Consonant acoustics, constrictions Phonation types	J Chs. 7, 8, 9 L & J Ch. 6	Quiz 5 (5/12) Exercise 3 (5/12)
8	5/19 – 5/23	Tones, prosody	L&J Ch. 10	Quiz 6 (5/19)
9	5/26 – 5/30	Audition, perceptual cues	J Ch. 4	*No class on 5/26* Quiz 7 (5/28) Exercise 4 (5/28)
10	6/2 – 6/6	More perception, summary and review Instrumental phonetics	J Ch. 5 Stone (1997)	Quiz 8 (6/2) Exercise 5 (6/6)
11	6/9 – 6/13	Exam week		Final Exam (6/9) *10:30 am – 12:30 pm* Final Paper (6/13)