Course information and policies (Syllabus)

Instructor	**Jennifer Smith** (jlsmith@email.unc.edu), 309 Smith Bldg, *she/her* • You are welcome to call me Jen, Dr. Smith, or Prof. Smith.
Course meets	**MWF 11:15–12:05, Murray G201** [E/F-8 on map] • In-person instruction: Lecture, discussion, hands-on labs and activities.
Textbooks	*Acoustic & Auditory Phonetics,* 3 ed. (K. Johnson, 2012) *Vowels and Consonants,* 3ed. (P. Ladefoged & S. Disner, 2012) • At campus bookstore. Additional readings may be distributed in class or online.
Web site	https://users.castle.unc.edu/~jlsmith/ling520.html • Resources, assignments, and a detailed course syllabus (updated after every class).
Office hours	W 1:15–2:30 (309 Smith Bldg) and by appointment • Come if you have questions, need help, or want more information—or just to say hi!

I. Overview and learning outcomes

Linguistic Phonetics is an introduction to the general principles and concepts of linguistic phonetics, using audiovisual materials and hands-on projects. In this course, you will:

- Learn **basic acoustics** for speech analysis
  - How are **sound waves** produced, and what are their general properties?
  - What are **formants**, and how are their frequencies determined?
- Use **speech analysis software** to investigate speech sounds
  - What are the **acoustic properties** of different kinds of sounds?
  - Which acoustic properties are **linguistically relevant**?
- Learn about the articulation of speech sounds, including the **anatomy of the vocal tract** and the **physiology of speech production**
  - How are speech sounds **articulated**?
  - Which articulatory properties are **linguistically relevant**?
  - How does articulation **relate** to acoustics?
- Learn how to **design an experiment** and how to **analyze quantitative data**
  - What makes a good **research question**? How can we generate and test **hypotheses**?
  - How should we plan an experiment, from **stimuli** to **data analysis**?
  - How can we interpret and communicate **numerical results**?
- Use the **International Phonetic Alphabet (IPA)** to transcribe speech sounds

LING/ANTH 520. Linguistic Phonetics. Introduction to the general principles of linguistic phonetics; anatomy of vocal tract, physiology of speech production, universal phonetic theory. Practice in the recognition and transcription of speech sounds. *IDEAs in Action Gen Ed:* FC-NATSCI or FC-QUANT.

II. Who is this course for?

- This course is for linguistics students, students in pre-Speech & Hearing, and anyone who wants to learn about the acoustics and articulation of human speech. (For more about the linguistics major, minor, and BA/MA, see https://linguistics.unc.edu/.)
- Requirements satisfied: LING BA & MA core course | Data Science Minor elective | IDEAs FCs NatSci and Quant (see VII below for Learning Outcomes and Questions for Students).

- This course emphasizes using quantitative (numerical) data to ask and answer questions in phonetics. Quantitative methods are useful in all areas of linguistics. Also, experiment and analysis skills are relevant far beyond the study of language!
- There are no prerequisites, although **LING 101** (Intro to Language) is recommended for undergraduates. We will frequently use high-school-level **algebra** skills.

III. Course requirements and grading information

Final grades are calculated as follows:

A.	Preparation questions	20%
B.	Lab assignments	30%
C.	Midterm exam	15%
	Final exam	15%
D.	Final project	20%

Grading scale *(letter → number)*:

A+*	97-100 (98)	C+	77–79 (78)
A	93–96 (95)	C	73–76 (75)
A–	90–92 (91)	C –	70–72 (71)
B+	87–89 (88)	D+	67–69 (68)
B	83–86 (85)	D	60–66 (65)
B–	80–82 (81)	F	0–59

**No A+ final course grades at UNC*

A. Participation and preparation questions

The best way to *learn* phonetics is to *do* phonetics! Be actively engaged in this course.

- For each class meeting:
  - Complete any assigned **readings**, **activities**, and **prep questions** *before class*.
  - **Attend class** and participate in activities, labs, and discussions.

  Attendance and participation are not directly graded, but preparing for and attending class will help you master the course material. Expect to be asked to participate!
- Each **prep questions** assignment is graded A or B, where A means complete, substantially correct, and insightful, and B means complete. Prep questions are due by **11:15am** (class start time). Late or missing prep questions are graded 0, but the lowest-scoring 10% of your prep questions will be dropped.

B. Lab assignments

There are approximately 8 **lab assignments** over the course of the semester, about one each week except at midterm-exam time and final-project time. Lab assignments give you hands-on practice with speech-sound analysis using the Praat software, experiment design, and/or data analysis and interpretation. Some labs are done in **partner groups**.

- Lab assignments are usually made available on Wednesday and due the following Monday, to be submitted on Sakai (unless otherwise announced).
- Lab assignments start out simpler and become more complex as the semester progresses. The point values of the different lab assignments vary accordingly.
- For most lab assignments, there is one class day that is designated as lab work time. Use the time in class to work on your lab assignment, collaborate with your partner group, or ask me questions. Please note that some of the lab assignments will take longer than one class period to fully complete.

Lab assignments are graded on a numerical scale. The overall lab assignment grade is calculated as total points earned divided by total points possible.

C. Midterm and final exams

Exams will be given in our classroom. Exam dates are firm: the **midterm** will only be postponed in extreme circumstances, such as a class cancellation on that date or the class before. The **final exam** date is set by the Office of the Registrar and cannot be changed, unless you qualify for an Exam Excuse Form through the office of the Dean of Students.

If you qualify for exam-related accommodations, be sure to register with Accessibility Resources and Service (ARS), and send me an instructor notification before the midterm.

- MIDTERM EXAM: **Friday, September 30, in class**
  - IPA symbols and traditional articulatory descriptions for designated vowels
  - Simple and complex waves
  - Fundamental frequency (pitch) in language
  - Standing waves, boundary conditions, and resonance frequencies
  - The source-filter model of schwa
  - Modeling and interpreting vowel formants: tube models, perturbation theory
- FINAL EXAM: **Friday, December 9, 12-3pm**

  The final exam will be **cumulative**, including topics from the midterm and also:
  - IPA symbols and articulatory descriptions for designated consonants
  - Modeling the acoustics of consonants
  - Voice Onset Time, phonation, and phonation types
  - Airstream mechanisms
  - Experiment design and methodology in phonetics
  - Data analysis and interpretation

D. Final project

The **final project** is your chance to use the phonetic analysis skills you have developed throughout the semester and apply them to an original research topic. You and your partner group will: propose your own **research question** to investigate, develop a **methodology** and **analysis** plan, carry out the necessary **experiments** and **measurements**, **present** your work to the class, and **revise** your slides in response to feedback. More information about the final project will be provided later in the semester.

A note on partner groups

Some of the lab assignments and the final project will be done in **partner groups**. Reasons for incorporating groups in this course include:

- Completing an interesting and satisfying final project requires more work than one person can reasonably do, so doing the project as a partner group means you can do something more significant. Collaboration on some of the lab assignments lets you get the partner group working smoothly before you start the final project.
- You never really understand something until you've had to explain it to someone else. As you work with your partner group, you will need to explain things to each other, and everyone will understand the course material better as a result.
- Finally, this is how real research is often done! Researchers work with other people,

share the ideas, share the labor, spot opportunities or mistakes that a collaborator overlooked, present the results together, and share the credit.

I will assign the partner groups, on the basis of questionnaires, to ensure that there is a fair distribution of *skills and backgrounds* among the groups. It is your job to ensure that there is a fair distribution of *work* within each partner group, so be sure to negotiate this each time your group works together on an assignment. Grades for partnered assignments take individual contributions into account. **Partner groups typically work well in this course, but I am always available to help if problems arise.**

IV. Course policies

Devices in class: Please use laptops or other devices only for class-related activities. Studies show that students who use devices for non-class activities impair their own learning—and their neighbors' learning too (Fried 2006; Sana, Weston, & Cepeda 2013).

Accessing sound files: Some assignments require listening to sound files. You are strongly encouraged to use headphones or earphones for this; the audio quality will be much better. If listening to sound files will be difficult for any reason, please contact me early so that we can discuss your situation and consider alternative assignments.

Class absences: If you need to miss class for health or other reasons, be sure to keep up with course material and assignment deadlines posted on the course web site. Lecture outlines and other items will be posted there shortly before or after class.

Late assignments: Assignments have due dates because material in this course builds on earlier concepts. However, sometimes emergencies happen or life is complicated.

(i) If you know an assignment will be late, please email me to request an extension **at least 24 hours** before it is due. I don't need proof that you "need" extra time, and in most cases, I will give you an extension. Note that in some cases (such as when the material will be discussed in class before your extended deadline), there will be a 10% to 20% late penalty on your grade.

(ii) If an emergency makes you unable to complete an assignment by its deadline, please email me to let me know as early as possible. Such assignments will generally be accepted, possibly with a late penalty.

(iii) Prep questions are **not** accepted late for credit, because they are linked to class preparation and the lowest 10% of scores are dropped (see III.A above).

Collaboration/citation for assignments:

- You are encouraged to discuss assignments with other students, but every student or partner group must write up her/his/their assignment **independently**.
- If any **reference materials** other than course readings, lecture outlines, handouts, course web pages, or your own class notes are consulted, you are required to list such outside references in your assignment. (Outside materials will not be necessary except when specified.)

Make-up exams: If you must miss the midterm exam, contact me *in advance* to determine whether you are eligible for a make-up exam. Without prior permission, a missed exam may not be made up unless you have documentation from Health Services, your

dean, or another appropriate authority to demonstrate that your absence was unexpected and unavoidable. (The *final* exam may only be made up with official permission from the office of the Dean of Students.)

Weather cancellations: Unless University classes are officially canceled, you should assume that our class will be held, but if there is bad weather, use your own judgment about whether it is safe for you to travel to campus. If classes are canceled, check the course web site for announcements and schedule changes.

Other policies and resources: See the document "Information for Undergraduate Classes" at https://curricula.unc.edu/wp-content/uploads/sites/332/2022/04/Summer-Fall-2022-Insert-1.pdf for general policies on: syllabus changes, attendance policy (including University Approved Absences), Honor Code, mask use, acceptable use of technology resources, Accessibility Resources (ARS), Counseling and Psychological Services (CAPS), Title IX, non-discrimination, diversity, the Undergraduate Testing Center, the Learning Center, the Writing Center, and grade appeals.

V. Schedule of course topics

The schedule of course topics is available on the course web site, at:
https://users.castle.unc.edu/~jlsmith/ling520/schedule.html

VI. More about phonetics: Additional readings

The following books are useful resources for phonetics. You can use them for more information on topics covered in class, or to learn about additional phonetics topics. They have been put on reserve for our course, and some of them are available as ebooks (see "Course reserves" on Sakai).

Thomas, Erik (2011). *Sociophonetics: An introduction*. Basingstoke: Palgrave Macmillan.
- Practical information for working with spectrograms and analyzing sociolinguistic variation.

Ladefoged, Peter (2003). *Phonetic data analysis*. Malden, MA: Blackwell.
- Good tips on both acoustic analysis and practical fieldwork in phonetic research.

Ladefoged & Johnson (2011). *A Course in Phonetics*, 6th ed. Boston: Wadsworth.
- Discusses the articulation and acoustics of non-English sounds in more detail than *Vowels and Consonants*.

International Phonetic Assoc. (1999). *Handbook of the International Phonetic Association.* Cambridge, UK: Cambridge University Press.
- Provides more information about the use of the IPA and the sounds represented by the symbols. Phonetic analyses of a number of languages are also given.

Stevens, Kenneth N. (1998). *Acoustic Phonetics.* Cambridge, MA: MIT Press.
- A very comprehensive, technical book on acoustic phonetics.

VII. IDEAs in Action Focus Capacities

A. Natural Scientific Investigation (FC-NatSci)

Learning Outcomes

These are the learning outcomes that are expected of students after completing a course.

- Demonstrate the ability to use scientific knowledge, logic, and imagination to construct and justify scientific claims about naturally occurring phenomena, including validation through rigorous empirical testing.
- Analyze and apply processes of scientific inquiry as dictated by the phenomena and questions at hand. These include generating and testing hypotheses or theories pertaining to the natural world; using logic and creativity to design investigations to test these hypotheses; collecting and interpreting data about the natural world; making inferences that respect measurement error; building and justifying arguments and explanations; communicating and defending conclusions; revising arguments and conclusions based on new evidence and/or feedback from peers; and synthesizing new knowledge into broader scientific understanding.
- Evaluate science-related claims and information from popular and/or peer-reviewed sources by examining the relationship between the evidence, arguments, and conclusions presented and by assessing consistency with existing knowledge from valid and reliable scientific sources.
- Identify, assess, and make informed decisions about ethical issues at the intersections of the natural sciences and society.

Questions for Students

These are the types of questions you should be able to answer after completing a course.

- What rules govern the natural world, and how are they discovered, tested, and validated?
- What is distinctive about the approach to understanding employed in the natural sciences?
- What challenges are encountered in making measurements of the natural world?
- What are the limits of investigation in the natural sciences?

B. Quantitative Reasoning (FC-QUANT)

Learning Outcomes

These are the learning outcomes that are expected of students after completing a course.

- Summarize, interpret, and present quantitative data in mathematical forms, such as graphs, diagrams, tables, or mathematical text.
- Develop or compute representations of data using mathematical forms or equations as models, and use statistical methods to assess their validity.
- Make and evaluate important assumptions in the estimation, modeling, and analysis of data, and recognize the limitations of the results.
- Apply mathematical concepts, data, procedures, and solutions to make judgments and draw conclusions.
- Synthesize and present quantitative data to others to explain findings or to provide quantitative evidence in support of a position.

Questions for Students

These are the types of questions you should be able to answer after completing a course.

- What is the role of mathematics in organizing and interpreting measurements of the world?
- How can mathematical models and quantitative analysis be used to summarize or synthesize data into knowledge and predictions?
- What methodology can we apply to validate or reject mathematical models or to express our degree of confidence in them?