

# Core 103 Syllabus Human Speech

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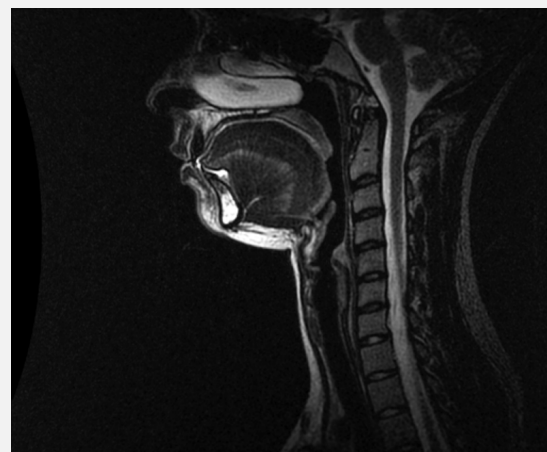


image courtesy of Dr. Yongwan Lim

## Course Evaluations

### Prof. Dani Byrd

USC Linguistics Dept.  
GFS 301

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2:50

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*Spoken language is a hallmark capacity of human cognition. This course introduces students to thinking about language as a physical act taking place in a dynamic and social context. We study the astonishing diversity of speech sounds that encode words in the world's languages and learn how these sounds are articulated in the vocal tract. We tackle an elementary understanding of the acoustics of speech and of the physiology of healthy hearing. Students discover fundamental characteristics of human speech perception and consider the amazing process of how babies acquire language. We then turn our attention to bilingualism, second language acquisition, and language diversity and variation. This body of knowledge is ultimately deployed in a consideration of vocal performance and of speech in breakdown—how certain diseases and disorders can affect the ability to speak and hear. We finish by considering implications of what we have learned for speech technologies including cochlear implants, speech synthesis, and automatic speech recognition. Multimodal material is featured throughout the course, including state-of-the-art medical imaging, AV demonstrations, and online videos and resources.*

## Class Meetings Spring 2024

*Lecture:* Th Th 12:30-1:50 (63513D) in WPH 102

*Discussion Sections:* Fridays at 11 (63514D) in THH 205 and at 12 (63515D) in DMC 255

Occasional meetings may occur in 'lab' timeslot Tues 5-8

If we are remote, here are Professor Byrd's [Netiquette](#) expectations for the virtual classroom.

*Core 103—The Process of Change in Science—is a science General Education Course in USC's Thematic Option Honors Program examining critical problems in the development of scientific thought, studied as vehicles for understanding the content and structure of the sciences. Specific subject matter in selected scientific disciplines is presented.*

## Course Goals

- To place human language in the context of cognitive science
- To begin to think about spoken language in a dynamic & social context
- To understand how the sounds of the world's languages are articulated and coordinated
- To have an elementary understanding of the acoustics of speech
- To understand fundamental properties of speech perception
- To become familiar with the acquisition of speech and the forms of its breakdown in various speech and hearing disorders
- To see implications of this knowledge for spoken language technologies

## Learning Objectives

- Demonstrate learning related to course goals through question-answer assessment
- Quantify and analyze original data in mini datasets
- Peruse, assess and select original research articles from library journal collections
- Synthesize accurately primary research literature in speech science
- Explain in written and oral form experimental and/or quantitative data and findings related to human spoken language
- Develop a functional understanding of healthy and disordered language that can be drawn on to make informed life decisions.

## Book

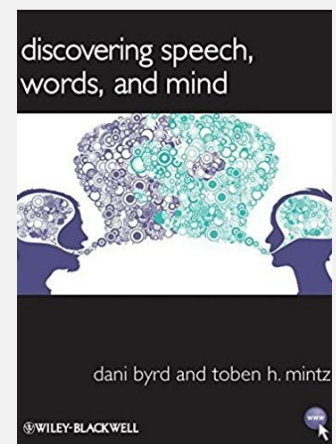
D. Byrd & T. Mintz. (2010) [\*Discovering Speech, Words, and Mind\*](#). Wiley-Blackwell Publishing. (Also available on reserve at Leavey.)

Other readings will be assigned and posted as links or downloadable pdfs.

## Work

- Reading in preparation for class
- Attendance and participation in class required
- Assigned independent work
- Three tests (non-cumulative)

**Slack** will be used for information sharing about interesting media,



news and current events, to reiterate in-class announcements, or for class-relevant conversation. Please turn on notifications for the class channel.

## Grades

- Test 1: 20%
- Test 2: 20%
- Test 3: 20% (not cumulative but in the final exam timeslot)
- Four homeworks: 18% total (no late assignments accepted except as noted below)
- Two short papers (a written lab report and a self-selected written research synopsis with oral presentation): 22% total (no late assignments accepted)
- Participation: For course grades that are computed to be 'on the bubble,' in-lecture engagement and participation (including 'TestBank' contributions) may be taken into account in tipping a grade upward or not.

**Assignments:** Some assignments will involve the use of a computer; some will be writing and/or analysis oriented. Assignments will be released at least one week prior to their due date. [Audacity](#) sound editing software will be used and is downloadable. Phonetics fonts are available from the [International Phonetic Association](#) or via the symbol character viewer on a mac; or they may be handwritten.

**Late homeworks** are not accepted with the following exception: A request to the professor in advance to use your course 'TimeBank' allows for one two-day extension or two one-day extensions over the course of the semester to be applied to a **Homework only**—**not** applicable for the lab report, paper, or oral presentation.

**All assignments are to be done \*\*independently\*\***, not in teams, not with partners, not in collaboration. Copying *or* collaborating on homework assignments (or exams) will be considered a violation of Academic Integrity (see further below). If I believe material submitted by a student was produced by A.I. (e.g. ChatGPT) or it is flagged by a GPT Detector, I reserve the right give the student an impromptu oral exam on the same material.

**The course** will be graded on a curve (applied to final grades); the curve will not move grades down.

**Tests** cannot be 'made up' or taken early unless arrangements with the instructor are *made in advance* and are due to documented *unavoidable circumstances* (aka an [emergency](#)).

## Detailed Course Schedule

### with Readings and Assignments by Week

<https://sites.google.com/view/danibyrd-home/core-103-syllabus/core-103-weekly-schedule>

#### Topic Outline

Week 1	Introduction and Course Overview The Speech Chain; Vocal Tract Anatomy English Sounds
Week 2	Transcription Speech Acoustics: Waveforms
Week 3	Speech Acoustics: Source Filter Theory Formants and Vowels
Week 4	Spectrograms; Sounds of the World's Languages: Consonants and Vowels Sounds of the World's Languages: Airstream Mechanisms
Week 5	Sounds of the World's Languages: Phonation Type & Tone Varieties of English
Week 6	Test 1 (material weeks 1-5.1) Qualities of the Speech Signal: Lack of Invariance & Lack of Segmentability
Week 7	Sine Wave Speech, McGurk Effect, and Word Segmentation Speech Perception: Categorical Perception
Week 8	Speech Perception (cont.): Categorical Perception and Infant Language Acquisition Duplex Perception and Theories of Speech Perception
Week 9	Phonology and Speech Errors Test 2 (material weeks 6-9)
Week 10	Bilingualism
Week 11	Guest Speaker--Heritage Languages Hearing and Deafness
Week 12	Hearing Loss and Hearing Technologies Signed Languages



Week 12	Speech and Voice Disorders Speech Technologies: Speech Synthesis
Week 13	Oral presentations  Speech Technologies Class Conclusion
Week 14	Test 3 (material weeks 10-15)
Week 15	
Final Exam Slot (Test 3) Wed May 10, 2-4pm	

## [USC and Related Support Resources](#)

<https://sites.google.com/view/uscpdongroup/usc-support>

### Communication, Policy and Academic Integrity Information

In addition to the utility of Blackboard, it will be useful to communicate with each other **using email**. In this way, you can be advised of changes, and I can be advised of any problems that you encounter. Please know that for this class *I will expect you to check your email*. In case you are unfamiliar with email, communications should be respectful and grammatical.

*Statement on Plagiarism* – presenting someone else’s ideas as your own, either verbatim or recast in your own words – is a serious academic offense with serious consequences. Other forms of academic dishonesty are equally unacceptable. Please familiarize yourself with the discussion of plagiarism and the Student Community Expectations for Integrity and Accountability in the [USC Student Handbook](#) (p. 11-13) and with university policy on [Research and Scholarship Misconduct](#). I expect all students to uphold these expectations. Because violations of academic integrity harm every student in the class, the instructor will aggressively prosecute any student who cheats on an exam or homework or who allows others to cheat on an exam or homework. All homework and tests in this class are completely independent assignments prohibiting collaboration of any kind.

**Final Exam Schedule Notice**—Note that [USC requires](#) that: “No deviations from the published examination period are permitted for courses scheduled in a standard session during the fall and

spring semesters, unless faculty have authorization in advance from the Committee on Academic Policies and Procedures (CAPP). CAPP will not consider any faculty request for rescheduling a final examination without unanimous written consent of all students in the class...No student is permitted to omit or take early a final examination and no instructor is authorized to permit a student to do so.”

**Emergency Preparedness/Course Continuity in a Crisis**—Please ensure that you are signed up with TrojanAlerts. “In case of a declared emergency if travel to campus is not feasible, USC executive leadership will announce an electronic way for instructors to teach students in their residence halls or homes using a combination of Blackboard, teleconferencing, and other technologies. See the university’s site on [Campus Safety and Emergency Preparedness](#).”

(The inclusion here of the material below is required by USC.)

### **Academic Integrity**

The University of Southern California is foremost a learning community committed to fostering successful scholars and researchers dedicated to the pursuit of knowledge and the transmission of ideas. Academic misconduct is in contrast to the university’s mission to educate students through a broad array of first-rank academic, professional, and extracurricular programs and includes any act of dishonesty in the submission of academic work (either in draft or final form).

This course will follow the expectations for academic integrity as stated in the [USC Student Handbook](#). All students are expected to submit assignments that are original work and prepared specifically for the course/section in this academic term. You may not submit work written by others or “recycle” work prepared for other courses without obtaining written permission from the instructor(s). Students suspected of engaging in academic misconduct will be reported to the Office of Academic Integrity.

Other violations of academic misconduct include, but are not limited to, cheating, plagiarism, fabrication (e.g., falsifying data), knowingly assisting others in acts of academic dishonesty, and any act that gains or is intended to gain an unfair academic advantage.

The impact of academic dishonesty is far-reaching and is considered a serious offense against the university and could result in outcomes such as failure on the assignment, failure in the course, suspension, or even expulsion from the university.

For more information about academic integrity see the [student handbook](#) or the [Office of Academic Integrity’s website](#), and university policies on [Research and Scholarship Misconduct](#).

### **Course Content Distribution and Synchronous Session Recordings Policies**

USC has policies that prohibit recording and distribution of any synchronous and asynchronous course content outside of the learning environment.

**Violations of Academic Integrity:** Recording a university class without the express permission of the instructor and announcement to the class, or unless conducted pursuant to an Office of Student Accessibility

Services (OSAS) accommodation. Recording can inhibit free discussion in the future, and thus infringe on the academic freedom of other students as well as the instructor. ([Living our Unifying Values: The USC Student Handbook](#), page 13).

**Violations of Academic Integrity:** Distribution or use of notes, recordings, exams, or other intellectual property, based on university classes or lectures without the express permission of the instructor for purposes other than individual or group study. This includes but is not limited to providing materials for distribution by services publishing course materials. This restriction on unauthorized use also applies to all information, which had been distributed to students or in any way had been displayed for use in relationship to the class, whether obtained in class, via email, on the internet, or via any other media. ([Living our Unifying Values: The USC Student Handbook](#), page 13).

## Course Evaluations

Course evaluation occurs at the end of the semester university-wide.

## Students and Disability Accommodations

USC welcomes students with disabilities into all of the University's educational programs. The Office of Student Accessibility Services (OSAS) is responsible for the determination of appropriate accommodations for students who encounter disability-related barriers. Once a student has completed the OSAS process (registration, initial appointment, and submitted documentation) and accommodations are determined to be reasonable and appropriate, a Letter of Accommodation (LOA) will be available to generate for each course. The LOA must be given to each course instructor by the student and followed up with a discussion. This should be done as early in the semester as possible as accommodations are not retroactive. More information can be found at [osas.usc.edu](https://osas.usc.edu). You may contact OSAS at (213) 740-0776 or via email at [osasfrontdesk@usc.edu](mailto:osasfrontdesk@usc.edu).

## Support Systems:

[Counseling and Mental Health](#) - (213) 740-9355 – 24/7 on call

Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention.

[988 Suicide and Crisis Lifeline](#) - 988 for both calls and text messages – 24/7 on call

The 988 Suicide and Crisis Lifeline (formerly known as the National Suicide Prevention Lifeline) provides free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week, across the United States. The Lifeline is comprised of a national network of over 200 local crisis centers, combining custom local care and resources with national standards and best practices. The new, shorter phone number makes it easier for people to remember and access mental health crisis services (though the previous 1 (800) 273-8255 number will continue to function indefinitely) and represents a continued commitment to those in crisis.

[Relationship and Sexual Violence Prevention Services \(RSVP\)](#) - (213) 740-9355(WELL) – 24/7 on call

Free and confidential therapy services, workshops, and training for situations related to gender- and power-based harm (including sexual assault, intimate partner violence, and stalking).

[Office for Equity, Equal Opportunity, and Title IX \(EEO-TIX\)](#) - (213) 740-5086

Information about how to get help or help someone affected by harassment or discrimination, rights of protected classes, reporting options, and additional resources for students, faculty, staff, visitors,



and applicants.

[Reporting Incidents of Bias or Harassment](#) - (213) 740-5086 or (213) 821-8298

Avenue to report incidents of bias, hate crimes, and microaggressions to the Office for Equity, Equal Opportunity, and Title for appropriate investigation, supportive measures, and response.

[The Office of Student Accessibility Services \(OSAS\)](#) - (213) 740-0776

OSAS ensures equal access for students with disabilities through providing academic accommodations and auxiliary aids in accordance with federal laws and university policy.

[USC Campus Support and Intervention](#) - (213) 740-0411

Assists students and families in resolving complex personal, financial, and academic issues adversely affecting their success as a student.

[Diversity, Equity and Inclusion](#) - (213) 740-2101

Information on events, programs and training, the Provost's Diversity and Inclusion Council, Diversity Liaisons for each academic school, chronology, participation, and various resources for students.

[USC Emergency](#) - UPC: (213) 740-4321, HSC: (323) 442-1000 – 24/7 on call

Emergency assistance and avenue to report a crime. Latest updates regarding safety, including ways in which instruction will be continued if an officially declared emergency makes travel to campus infeasible.

[USC Department of Public Safety](#) - UPC: (213) 740-6000, HSC: (323) 442-1200 – 24/7 on call

Non-emergency assistance or information.

[Office of the Ombuds](#) - (213) 821-9556 (UPC) / (323-442-0382 (HSC)

A safe and confidential place to share your USC-related issues with a University Ombuds who will work with you to explore options or paths to manage your concern.

[Occupational Therapy Faculty Practice](#) - (323) 442-2850 or [otfp@med.usc.edu](mailto:otfp@med.usc.edu)

Confidential Lifestyle Redesign services for USC students to support health promoting habits and routines that enhance quality of life and academic performance.

Date Last Modified: Dec 2023

Web Art Credit: Lena Foellmer

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