

San José State University
Humanities and Arts / LLD
LING 123, Sound Communication, Fall 2018

Class	Topic	Reading	Optional web material
Part I: Introduction			
8-22	Introduction to Linguistics 123	-	
8-27	Introduction to animal communication	H 1, 5.1	
8-29	<i>Great Transformations</i> (video)	-	Evolution (PBS series)
Part II: Sound waves			
9-5	Sound waves	L 1-2	Wave animations
9-10	Complex waves	L 3-4	Hearing animation
9-12	Sound analysis laboratory practice	-	Download WaveSurfer , bullfrog.wav , chickadee.wav
Part III: Animal communication systems			
9-17	Frog advertisement calls	H 4.2.1, 6.2.1	Frog Calls , Narins laboratory , Deep-voiced men have more kids (MSNBC)
9-19	<i>Signals and songs</i> (video); Sound labs due	-	The Life of Birds (PBS series)

9-24	Bird song: introduction	-	Birdsong on Fresh Air , Cornell Ornithology Lab
9-26	Bird song: ontogeny and neuroanatomy ; <i>sound labs returned</i>	H 4.2.2, 5.2, 6.2.2	
10-1	Bird calls	H 5.2	Chickadee dictionary Raccoon Call , Hawk Call , Food Call
10-3	Signalling theory ; First essay due	H 2.2, 6.4, 7.4	Secrets of the stomatopod ; Stomatopod labs: Caldwell , Patek
10-8	Vocal communication in rhesus macaques Families in the Wild (Video)	H 3.3	
10-10	Predator alarm calls	H 5.3, 6.3, 7.3.1	Mateo lab
10-15	Review: animal communication sample midterm questions	-	
10-17	First Midterm	-	BRING SCANTRON T&E-0200
Part IV: Human speech			
10-22	Evolution of language	H 2, P 11	
10-24	Articulatory phonetics	H 4.4.2, P 6	UCLA demos , Pronounceable IPA chart , X-ray films , X-ray films (Sweden)
10-29	Acoustics of speech	L 5-8	Voice Analysis Lacks Accuracy (CBS)

10-31	Phonology	-	CMU Pronouncing Dictionary
11-5	<i>Review: human speech</i>	-	
11-7	Speech analysis laboratory practice	-	Download WaveSurfer, willhego.wav
Part V: Human language			
11-14	Child language acquisition	H 5.4.2, P 2, 9	CHILDES , audio clips , Babies know more than you think
11-19	Language and the brain ; <i>Speech labs due</i>	H 4.4.2, P 10	
11-26	Language and the brain		
11-28	Monkey in the Mirror (video);		
12-3	Words and sentences	-	
12-5	Words and sentences sound labs returned	P 3, 4, 5	
	Review: human language sample final questions	-	
12-10	<i>Second midterm</i>		<i><u>BRING SCANTRON T&E-0200</u></i>

Subject to change with fair notice

Instructor: Dan Silverman

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Office Hours: MoWe 12:30 - 1:30

Class Days/Time: MoWe 3:00PM - 4:15PM

Classroom: Clark 216

GE/SJSU Studies Category: Area R: Earth and Environment. Courses to meet Areas R, S, and V of SJSU Studies must be taken from three different departments, or distinct academic units.

Prerequisites: Writing Skills Test (WST), completion of Core General Education, and completion of, or co-registration in, 100W.

Faculty Web Page and MYSJSU Messaging

All course materials are available from this document

id: student

password: student

You are responsible for regularly checking the email account you have registered at MySJSU for any announcements. Also, there may be very minor tweaks of the syllabus as we go along. I will make sure to announce these in class and by email.

The best way to contact me is by email. I'm usually good about answering quickly. However, if you email me about information that is already available at the course website, I won't answer, sorry! If you miss class, you don't need to email me. All teaching materials for the course are posted, linked to this syllabus. If you want extra notes on any missed lectures, please ask a classmate, not me. Of course, you're always welcome to come to my office hours or make an appointment.

Course Description

In this class we will explore questions like the following:

- What is communication? What is language?
- What are the physical properties of communicative sounds? How can these properties be quantified and measured?
- Why do birds sing, frogs croak, and humans speak? How did these particular communication systems evolve?
- How do humans and other animals produce their vocalizations? What organs of the body are involved in vocalization, and what do they do?
- How does human language differ from animal 'language'? Is human language a learned skill (like chess), or an instinct (like laughing), or something in between?

Linguistics 123 is a strongly multidisciplinary course. Our lectures and readings will jump eclectically among multiple scientific fields, most notably the following three:

1. **Acoustics**, the science of sound;
2. **Linguistics**, the science of human language; and
3. **Ethology**, the science of animal behavior, encompassing both proximate and evolutionary explanations.

Within these fields we will encounter many different (and sometimes conflicting) scientific perspectives on communication. In order to appreciate this theoretical diversity you will need to be able to think critically and skeptically

Course Goals and Student Learning Objectives

Upon successful completion of this course, students will be able to:

LO1 Understand sound as a physical phenomenon, and be able to solve simple problems in acoustics, such as calculating a sound's wavelength, frequency spectrum, and distance from source; (sound and speech lab assignments)

LO2 Be able to analyze recorded human speech and other acoustic data on a computer, and to draw conclusions from that data; (sound and speech lab assignments)

LO3 Understand the biological mechanisms that allow humans and certain other animals to produce and process vocalized signals; (essays one and two)

LO4 Understand how to analyze animal communication systems in terms of the four explanatory principles of ethology: adaptation, mechanism, ontogeny, and phylogeny;

(essays one and two)

LO5 Be able to list the essential design features of human language, and to explain how our language differs from the communication systems of other animal species. (essays one and two)

In addition to the course-level learning objectives listed above, there are three more general, learning objectives associated with all Area R courses. We label these Area R learning objectives A1, A2, and A3.

A1 A student should be able to demonstrate an understanding of the methods and limits of scientific investigation.

A2 A student should be able to distinguish science from pseudo-science.

A3 A student should be able to apply a scientific approach to answer questions about the earth and environment.

(H) Marc D. Hauser, The Evolution of Communication. ISBN: 0-262-08250-0

(L) Peter Ladefoged, Elements of Acoustic Phonetics. ISBN: 0-226-46764-3

(P) Steven Pinker, The Language Instinct: How the Mind Creates Language. ISBN: 0-06-097651-9

Good prices for these books are usually available at Abebooks.com, Amazon.com, etc.

Classroom Protoco

Dropping and Adding

Students are responsible for understanding the policies and procedures about add/drop, academic renewal, etc. Refer to the current semester's [catalog policies](http://info.sjsu.edu/static/catalog/policies.html) section at <http://info.sjsu.edu/static/catalog/policies.html> for any add/drop deadlines, policies, and procedures section and specific registration information. [Late drop policy](http://www.sjsu.edu/aars/policies/latedrops/policy/) is available at <http://www.sjsu.edu/aars/policies/latedrops/policy/>. Students should be aware of the current deadlines and penalties for dropping classes.

Assignments and Grading Policy

Course Requirements:

Your final grade in Linguistics 123 will be based on your performance on six different activities: two computer laboratory exercises, two in-class examinations, and two take-home essays.

Computer laboratories:

There will be two computer laboratories in which we will use the [WaveSurfer](#) program to analyze sound. Each is worth 10% of your final grade. In the first lab you will analyze a variety of recordings of animal calls. In the second lab you will analyze the sounds of

human speech; first some recorded sounds, and then your own speech. The laboratory exercises can be completed on your home computer, or in a computer lab on campus.

[WaveSurfer](#) is free software and runs on every computer platform. We'll be using this program for our labwork.

First Midterm Exam:

The in-class midterm exam will cover the material on sound waves and animal communication. It is worth 25% of your total grade. The exam is closed-book and closed-note. Most questions will draw on material from the class lectures. However, some questions will be based on material from the assigned readings in Hauser's book, even if this material was not discussed in class. **Please bring a T&E-0200 scantron and a pencil.**

Second Midterm Exam:

The in-class final exam should require only one hour to complete and is worth 25% of your final grade, the same as the midterm. The exam is closed-book and closed-note. The final exam will cover only human language, not animal communication; in other words, the final is not cumulative. Most questions will draw on material from the class lectures. However, some questions will be based on material from the assigned readings in Pinker's book, even if this material was not discussed in class. **Please bring a T&E-0200 scantron and a pencil.**

Essays:

You will write two essays for this class, each is worth 15% of your final grade. The due dates are listed in The class schedule below.

Each essay should be at least 1500 words long.

The topics of the two essays are explained below. Your essays will be assessed not only for content, but also for grammar, clarity, conciseness, and coherence. Your essays are expected to be accurate, relevant, and organized. Your writing should demonstrate an understanding of key scientific terms related to sound and communication. I expect to see accurate use of technical terms like the following: amplitude, spectrum, conspecific, heterospecific. In each essay, it's probably a good idea to make sure you have covered all four of Tinbergen's perspectives on animal behavior: adaptation, mechanism, ontogeny, and phylogeny. (Don't worry if you've never heard of any of these terms; we'll learn what they mean soon enough.) These assignments are not research papers, but rather short essays directed towards an educated layperson (that is, something you might read in *Scientific American*, not *Nature*). Their purpose is to assess your writing skills as well as your understanding of the material presented in class. I expect your essays to be based on the information presented in classroom lectures, and in the class textbooks (Hauser, Ladefoged, and Pinker). No outside research is required for these essays, although you're welcome to do so if you like. If you do use outside sources, be sure to cite them and

provide bibliographical entries. You may also cite particular sections or pages of the textbooks (Hauser, Ladefoged, and Pinker) if you like, but this is not required. There is no need to cite the class lecture notes. In any case, whatever your sources and citations, your writing must be your own work in your own words.

Essay 1: frogs vs. birds

The topic of the first essay is to compare and contrast the mating signals of two very different vertebrate orders: anurans (frogs and toads) vs. oscines (songbirds). What features do the anuran and oscine mating vocalizations share in common? What features are different? Your essay should discuss the mating signals themselves (their physical properties), as well as how and why those particular vocalizations are produced. You should discuss the organs and brain structures involved in the generation and processing of sound. Finally, you should compare the physical and social environments that frogs and songbirds live in, and what kinds of socioecological problems each is required to solve.

Essay 2: primate vocalizations vs. human language

The topic of the second essay is to compare and contrast human language versus the vocalizations of non-human primates (monkeys and apes). In the case of primates, you should characterize and explain the vocal communications of Rhesus and vervet monkeys, and optionally other primate species as well. In the case of human language, you should review the design features of human language, and explain whether primate communication systems share these features. How do these systems compare in terms of adaptation, mechanism (anatomy), and ontogeny?

Grading Percentage Breakdown

94% and above A

93% - 90% A-

89% - 87% B+

86% - 84% B

83% - 80% B-

79% - 77% C+

76% - 74% C

73% - 70% C-

69% - 67% D+

66% - 64% D

63% - 60% D

Below 60% F

Grading transparency: The total number of earnable points for this course is 100. For example, if you receive 9 points on a homework assignment worth 10 points, those 9 points will be added to your total point accumulation. I will periodically send out an email showing the grade breakdown. This will give you a sense of how you are doing in comparison to others in the class, so if you want to gauge your performance, you have the means to do so. When all scores are in at the end of the course, totals will be curved as

appropriate. Grades may be curved upward, but never downward. Just do your work, and do it conscientiously, and you'll do fine.

Extra credit options, if available:

No extra credit

Penalty (if any) for late or missed work:

I won't accept late work.

University Policies

Dropping and Adding

Students are responsible for understanding the policies and procedures about add/drop, grade forgiveness, etc. Refer to the current semester's Catalog Policies section at <http://info.sjsu.edu/static/catalog/policies.html>. Add/drop deadlines can be found on the current academic year calendars document on the Academic Calendars webpage at http://www.sjsu.edu/provost/services/academic_calendars/. The Late Drop Policy is available at <http://www.sjsu.edu/aars/policies/latedrops/policy/>. Students should be aware of the current deadlines and penalties for dropping classes. Information about the latest changes and news is available at the Advising Hub at <http://www.sjsu.edu/advising/>.

Consent for Recording of Class and Public Sharing of Instructor Material

University Policy S12-7, <http://www.sjsu.edu/senate/docs/S12-7.pdf>, requires students to obtain instructor's permission to record the course and the following items to be included in the syllabus:

- "Common courtesy and professional behavior dictate that you notify someone when you are recording him/her. You must obtain the instructor's permission to make audio or video recordings in this class. Such permission allows the recordings to be used for your private, study purposes only. The recordings are the intellectual property of the instructor; you have not been given any rights to reproduce or distribute the material."
 - o It is suggested that the greensheet include the instructor's process for granting permission, whether in writing or orally and whether for the whole semester or on a class by class basis.
 - o In classes where active participation of students or guests may be on the recording, permission of those students or guests should be obtained as well.
- "Course material developed by the instructor is the intellectual property of the instructor and cannot be shared publicly without his/her approval. You may not publicly share or upload instructor generated material for this course such as exam questions, lecture notes, or homework solutions without instructor consent."

Academic integrity

Students should know that the University's [Academic Integrity Policy](http://sa.sjsu.edu/judicial_affairs/faculty_and_staff/academic_integrity/index.html) is available at http://sa.sjsu.edu/judicial_affairs/faculty_and_staff/academic_integrity/index.html. Your own commitment to learning, as evidenced by your enrollment at San Jose State University and

the University's integrity policy, require you to be honest in all your academic course work. Faculty members are required to report all infractions to the office of Student Conduct and Ethical Development. The [Student Conduct and Ethical Development website](http://www.sa.sjsu.edu/judicial_affairs/index.html) is available at http://www.sa.sjsu.edu/judicial_affairs/index.html.

Instances of academic dishonesty will not be tolerated. Cheating on exams or plagiarism (presenting the work of another as your own, or the use of another person's ideas without giving proper credit) will result in a failing grade and sanctions by the University. For this class, all assignments are to be completed by the individual student unless otherwise specified. If you would like to include in your assignment any material you have submitted, or plan to submit for another class, please note that SJSU's Academic Policy F06-1 requires approval of instructors.

Campus Policy in Compliance with the American Disabilities Act

If you need course adaptations or accommodations because of a disability, or if you need to make special arrangements in case the building must be evacuated, please make an appointment with me as soon as possible, or see me during office hours. Presidential Directive 97-03 at http://www.sjsu.edu/president/docs/directives/PD_1997-03.pdf requires that students with disabilities requesting accommodations must register with the Accessible Education Center (AEC) at <http://www.sjsu.edu/aec> to establish a record of their disability.

Accommodation to Students' Religious Holidays

San José State University shall provide accommodation on any graded class work or activities for students wishing to observe religious holidays when such observances require students to be absent from class. It is the responsibility of the student to inform the instructor, in writing, about such holidays before the add deadline at the start of each semester. If such holidays occur before the add deadline, the student must notify the instructor, in writing, at least three days before the date that he/she will be absent. It is the responsibility of the instructor to make every reasonable effort to honor the student request without penalty, and of the student to make up the work missed. See University Policy S14-7 at <http://www.sjsu.edu/senate/docs/S14-7.pdf>.

Student Technology Resources

Computer labs for student use are available in the Academic Success Center located on the 1st floor of Clark Hall and on the 2nd floor of the Student Union. Additional computer labs may be available in your department/college. Computers are also available in the Martin Luther King Library.

A wide variety of audio-visual equipment is available for student checkout from Media Services located in IRC 112. These items include digital and VHS camcorders, VHS and Beta video players, 16 mm, slide, overhead, DVD, CD, and audiotape players, sound systems, wireless microphones, projection screens and monitors.

Learning Assistance Resource Center

The Learning Assistance Resource Center (LARC) is located in Room 600 in the Student Services Center. It is designed to assist students in the development of their full academic

potential and to motivate them to become self-directed learners. The center provides support services, such as skills assessment, individual or group tutorials, subject advising, learning assistance, summer academic preparation and basic skills development. The [LARC website](http://www.sjsu.edu/larc/) is located at <http://www.sjsu.edu/larc/>.

SJSU Writing Center

The SJSU Writing Center is located in Room 126 in Clark Hall. It is staffed by professional instructors and upper-division or graduate-level writing specialists from each of the seven SJSU colleges. Our writing specialists have met a rigorous GPA requirement, and they are well trained to assist all students at all levels within all disciplines to become better writers. The [Writing Center website](http://www.sjsu.edu/writingcenter/about/staff/) is located at <http://www.sjsu.edu/writingcenter/about/staff/>.

Peer Mentor Center

The Peer Mentor Center is located on the 1st floor of Clark Hall in the Academic Success Center. The Peer Mentor Center is staffed with Peer Mentors who excel in helping students manage university life, tackling problems that range from academic challenges to interpersonal struggles. On the road to graduation, Peer Mentors are navigators, offering “roadside assistance” to peers who feel a bit lost or simply need help mapping out the locations of campus resources. Peer Mentor services are free and available on a drop –in basis, no reservation required. The [Peer Mentor Center website](http://www.sjsu.edu/muse/peermentor/) is located at <http://www.sjsu.edu/muse/peermentor/>

Ling 123, Sound and Communication, Spring 2018

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	communication		
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9-5	Sound waves	L 1-2	Wave animations
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9-12	Sound analysis laboratory practice	-	Download WaveSurfer , bullfrog.wav , chickadee.wav
Part III: Animal communication systems			
9-17	Frog advertisement calls	H 4.2.1, 6.2.1	Frog Calls , Narins laboratory , Deep-voiced men have more kids (MSNBC)
9-19	<i>Signals and songs</i> (video); Sound labs due	-	The Life of Birds (PBS series)
9-24	Bird song: introduction	-	Birdsong on Fresh Air , Cornell Ornithology Lab
9-26	Bird song: ontogeny and neuroanatomy ; <i>sound labs returned</i>	H 4.2.2, 5.2, 6.2.2	
10-1	Bird calls	H 5.2	Chickadee dictionary

			Raccoon Call , Hawk Call , Food Call
10-3	Signalling theory ; First essay due	H 2.2, 6.4, 7.4	Secrets of the stomatopod ; Stomatopod labs: Caldwell , Patek
10-8	Vocal communication in rhesus macaques Families in the Wild (Video)	H 3.3	
10-10	Predator alarm calls	H 5.3, 6.3, 7.3.1	Mateo lab
10-15	Review: animal communication sample midterm questions	-	
10-17	First Midterm	-	BRING SCANTRON T&E-0200
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10-29	Acoustics of speech	L 5-8	Voice Analysis Lacks Accuracy (CBS)
10-31	Phonology	-	CMU Pronouncing Dictionary

11-5	<i>Review: human speech</i>	-	
11-7	Speech analysis laboratory practice	-	Download WaveSurfer, willhego.wav
Part V: Human language			
11-14	Child language acquisition	H 5.4.2, P 2, 9	CHILDES , audio clips , Babies know more than you think
11-19	Language and the brain; Speech labs due	H 4.4.2, P 10	
11-26	Language and the brai		
11-28	Monkey in the Mirror (video);		
12-3	Words and sentences	-	
12-5	Words and sentences sound labs returned	P 3, 4, 5	
	Review: human language sample final questions	-	
12-10	Second midterm		<u>BRING SCANTRON T&E-0200</u>

More bird song links

- [Internet Bird Collection](#)
- [Bird song files](#)
- [Bird songs of the Yucatan Peninsula](#)
- [Songs and calls of some New York State birds](#)
- [Index of bird song links](#)

Marc D. Hauser Links

- [Animal Minds](#) (Edge)
- [How does the Brain Generate Computation](#) (Edge)
- [Additional materials](#)

Birdsong links

- [Internet Bird Collection](#)
- [Bird song files](#)
- [Bird songs of the Yucatan Peninsula](#)
- [Songs and calls of some New York State birds](#)
- [Index of bird song links](#)
- [Birdsong on *Fresh Air* with Terry Gross](#)

Frog call links

- [Narins laboratory](#)
- [Midwest frogs](#)
- [University of Michigan](#)
- [USGS frog quiz](#)
- [Frogs and toads of North Carolina](#)
- [Frogs and toads of Texas](#)

Primate links

- [Primate info net](#)
- [Chimpanzee pant-hoots](#)

Stomatopod links

- [Secrets of the stomatopod](#)
- Labs: [Caldwell](#), [Korff](#), [Patek](#)

Other links

- [NOVA: Dances with Bees](#)
- [The Animal Communication Project](#)
- [Cornell Bioacoustics Research Program](#)
- [Chimpanzee pant-hoots](#)