

San José State University
Linguistics and Language Development
LING 124, Intro to Speech Technology, Sec. 01, Fall, 2018

Course and Contact Information

Instructor:	Hahn Koo
Office Location:	Clark Hall 485
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Email:	hahn.koo@sjsu.edu
Office Hours:	MTWR 1:30 PM – 2:00 PM
Class Days/Time:	TR 10:30 AM – 11:45 AM
Classroom:	Clark Hall 242
Prerequisites:	LING 101 and 111, or instructor's consent

Faculty Web Page and MYSJSU Messaging

Copies of course materials (e.g. syllabus, assignment handouts, reading materials) will be available at <http://linguistics.sjsu.edu/~hkoo/teaching/ling124/index.html>.

Course Description

Strategies in man-machine communication, with a focus on speech recognition and speech synthesis. Computer modeling of speech production and perception.

Course Learning Outcomes (CLO)

You will learn about ideas and methods relevant to automatic speech recognition and text-to-speech synthesis.

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

1. Explain computational methods that are relevant to speech technology.
2. Describe processes involved in developing speech technology systems.
3. Process and prepare text and speech data for development.
4. Evaluate the performance of speech technology systems.

Required Texts/Readings

All reading materials will be made available on the course website.

Course Requirements and Assignments

You are expected to complete computer lab assignments (80% of final grade) and give one in-class presentation (10% of final grade). Before I describe them in detail note that “Success in this course is based on the expectation that students will spend, for each unit of credit, a minimum of 45 hours over the length of the course (normally 3 hours per unit per week with 1 of the hours used for lecture) for instruction or preparation/studying or course related activities including but not limited to internships, labs, clinical practica. Other course structures will have equivalent workload expectations as described in the syllabus.”

The lab assignments are designed to teach you how to develop, utilize, and evaluate various components of ASR and TTS systems. So they directly address CLOs 3 and 4 as well as help you achieve CLO 2. You will be given a lab sheet and electronic resources (e.g. data files, software installed on a virtual machine) for each assignment. We will have a lab session for each assignment so you can ask me questions in person and collaborate with your classmates. Here are some details about the lab assignments:

- There will be a total of 12 assignments.
- Each assignment is worth 8 points.
- Email me your work within a week from the day of the lab session.
- I will deduct 1 point for each day late.
- I will drop two lowest scores and add the remaining ten scores to calculate your total lab score.

For the presentation, you will pick a research question of your own interest that is related to speech technology, choose a paper addressing it, and discuss the paper in class for 15-20 minutes. In your presentation, you should (1) state and define the research question, (2) explain why you are interested in the question, (3) how the authors of the chosen paper approach the question, (4) to what extent you think the authors have solved the question, and (5) what you think could be done more. You will get a chance to deepen and demonstrate your understanding of computational methods in the process, so this assignment helps you achieve CLO 1.

Final Examination or Evaluation

You will write a final essay that builds on the presentation you gave in class: You've read and discussed one paper on the topic of your interest. Read 2-3 more papers that address the same topic but take different approaches. In your essay, state the research question (as you did for the presentation), introduce the papers to be discussed (including the one you presented), and compare and contrast their approaches. Your essay should be 1500-2000 words long. The assignment is worth 10 points, i.e. the remaining 10% of your final grade. As is the case with the presentation, this assignment helps you achieve CLO 1.

Grading Information

Based on the total score by the end of the semester, your grade will be determined using the following table:

Score(s)	Grade	Score(s)	Grade	Score(s)	Grade
100	A+	76 - 81	B	52 - 57	C-
94 - 99	A	70 - 75	B-	46 - 51	D+
88 - 93	A-	64 - 69	C+	40 - 45	D
82 - 87	B+	58 - 63	C	34 - 39	D-
				0 - 33	F

Classroom Protocol

Do not disrupt the class. Limit your activities to those pertinent to class. Be courteous to everyone in class.

University Policies

See the relevant policies such as those on academic integrity, accommodations, etc. at <http://www.sjsu.edu/gup/syllabusinfo/>.

LING 124 Intro to Speech Technology, Fall, 2018, Course Schedule

The schedule below is subject to change with fair notice via announcements in class.

Course Schedule

Week	Date	Topics and Assignments
1	8/21	Introduction
1	8/23	Basic acoustics
2	8/28	Lab 1
2	8/30	Feature extraction I
3	9/4	Lab 2
3	9/6	Feature extraction II
4	9/11	Lab 3
4	9/13	Acoustic models
5	9/18	Lab 4
5	9/20	Language models
6	9/25	Lab 5
6	9/27	Decoding algorithms
7	10/2	Lab 6
7	10/4	Neural networks for speech recognition
8	10/9	Lab 7
8	10/11	Text processing
9	10/16	Lab 8
9	10/18	Concatenative synthesis
10	10/23	Lab 9
10	10/25	Prosody
11	10/30	Lab 10
11	11/2	Parametric synthesis
12	11/6	Lab 11
12	11/8	Neural networks for speech synthesis
13	11/13	Lab 12
13	11/15	Speaker identification

Week	Date	Topics and Assignments
14	11/20	Emotions in speech
15	11/27, 11/29	Student presentations
16	12/4, 12/6	Student presentations
Final	12/12 (Wed)	Email me your final essay by 11:59 PM