Language & Computers

Ling 4100/8803

Class Meetings

Instructor

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Office: Swann 331
Student hours:

Objectives

This is *not* a heavily implementation-focused Natural Language Processing class (although it would be a great complement or stepping stone to one). It's a class about the linguistic and conceptual issues in language technology, with implementation built in mainly to concretize the concepts. *Students will be able to...*

- Explain in their own words (and to some extent, implement using Python) some major ways that computers represent, manipulate, and "learn from" text/language data, for a variety of applications.
- Evaluate the performance of various language technologies based on a sophisticated understanding of the linguistic issues involved and how the language technology is carrying out the task.
- Be exposed to linguistic diversity and the complexity of linguistic data, and articulate consequences for language technology.
- Critically evaluate claims made in the media about the significance of new technology.
- Insightfully discuss concerns about bias, ethics, and privacy raised by language technology.
- Develop academic literacy by (verifiably) reading and presenting scholarly articles.
- Strengthen communication skills by giving in-class oral presentations and facilitating discussion.
- Enhance academic portfolio by developing a self-designed research project.
- Contribute to and benefit from a vibrant **in-person** socio-intellectual community.

Materials

- *Language and Computers* "second edition", by Lelia Glass, Marcus Dickinson, Chris Brew, and Detmar Meurers, pdf of an under-review updated textbook, available as a (continuously updated) pdf from Canvas
- Pdfs of academic articles

Grading criteria (90s=A, 80s=B, etc)

Please note that the automatic export from Canvas to Banner truncates rather than rounding; thus, 89.9 is a B.

Canvas is automatically programmed to give a 0 for all late work and to deduct 10% from all submitted assignments for each day past its deadline.

Assignments

Assignment	Frequency	Percentage
Attendance (attend class with both body and mind, no laptops unless otherwise specified) - *as documented by exit tickets, attention checks, reading assessments*	Throughout	10%
Attention Checks (in-class multiple choice assessments of lecture, homework, assigned readings)	10 (technically 12, but I drop lowest 2 scores)	50%
Homework	5 total	5%
Present article, lead discussion (in groups)	Once throughout semester	15%
Final presentation (5 min)	Once at end of semester	10%
Final writeup (pencil-and-paper responses to questions about final presentation) - 6 questions for grads; 3 questions for undergrads	During Final Exam period (Tuesday, May 4, 2:40-5:30)	10%
Total		100%

Week	Tuesday	Thursday	To Do
Week of January 11	Intro *(Faculty Exec Board - end 20 min early)*	Encodings	Homework 1 released
Week of January 18	Writers' Aids *"Exit ticket"*	Attention Check 1, including Homework 1; reading Present, discuss Mahowald et al (2023), "Grammatical cues to subjecthood"	Read Mahowald et al (2023) **Homework 1 due Thursday**

Week of January 25	Word vectors *"Exit ticket"*	Attention Check 2 including reading Present, discuss Hamilton et al (2016) "Diachronic word embeddings"	Read Hamilton et al (2016) Homework 2 released
Week of February 1	Generative LLMs *"Exit ticket"*	Attention Check 3 including reading Present, discuss Futrell and Mahowald (2026) "How linguistics learned to stop worrying"	Read Futrell and Mahowald (2026)
Week of February 8	Computer-assisted language learning *(Faculty Exec Board - end 20 min early)* *"Exit ticket"*	Attention Check 4, including Homework 2; reading Present, discuss Wilcox et al (2025) "Bigger is not always better"	Read Wilcox et al (2025) **Homework 2 due Thursday**
Week of February 15	Text as data *"Exit ticket"*	Attention Check 5 including reading Present, discuss Demszky et al (2019) "Analyzing polarization"	Read Demszky et al (2019) Homework 3 released
Week of February 22	Text classification *"Exit ticket"*	Attention Check 6 including reading Present, discuss Danescu-Niculescu-Mizil et al (2013) "Politeness"	Read Danescu-Niculescu-Mizil et al (2013)
Week of March 1	Information retrieval *(Faculty Exec Board - end 20 min early)* *"Exit ticket"*	Attention Check 7, including Homework 3; reading Present, discuss Sourati et al (2026) "Shrinking diversity"	Read Sourati et al (2026) **Homework 3 due Thursday** Homework 4 released
Week of March 8	Spring Break	Spring Break	
Week of March 15	Translation *"Exit ticket"*	Attention Check 8 including reading	Read Kallini et al (2024)

		Present, discuss Kallini et al (2024) "Mission: Impossible language models"	
Week of March 22	Dialog (1) *"Exit ticket"*	Attention Check 9, including Homework 4; reading Present, discuss Hu et al (2025) "Re-evaluating theory of mind"	Read Hu et al (2025) **Homework 4 due Thursday**
Week of March 29	Dialog (2) *(Faculty Exec Board - end 20 min early)* *"Exit ticket"*	Attention Check 10 including reading Present, discuss Grieve et al (2025) "Sociolinguistic foundations"	Read Grieve et al (2026) Homework 5 released - including final project idea
Week of April 5	Loose ends *"Exit ticket"*	Attention Check 11 including Homework 5; reading Present, discuss Cheng et al (2026) "Sychophantic AI"	Read Cheng et al (2026) **Homework 5 due Thursday**
Week of April 12	Epilog/Future of work *"Exit ticket"*	Attention Check 12 including reading Present, discuss Shaw and Nave (2026) "Cognitive surrender"	Read Shaw and Nave (2026)
Week of April 19	Prospectus presentations	Prospectus presentations	
Week of April 26	*Last instructional day* Prospectus presentations		
Week of May 3	Tuesday, May 4, 2:40-5:30: Final assessment (pencil-and-paper responses to questions about your		

	prospectus)		

Articles (by week)

Please note that these articles were written by people with PhDs in Computer Science/Linguistics for an audience of professional academics. These are challenging articles and it is okay if you do not understand them yet! Please approach the reading with a ***growth mindset*** *and don't worry if you don't understand part of the paper. If you are intimidated, try to focus on the abstract, introduction, conclusion, and any figures or examples to grasp the take-home point.*

Week of January 18:

- Kyle Mahowald, Evgeniia Diachek, Edward Gibson, Evelina Fedorenko, and Richard Futrell. "Grammatical cues to subjecthood are redundant in a majority of simple clauses across languages." *Cognition* 241 (2023): 105543.

Week of January 25

- William L. Hamilton, Jure Leskovec, and Dan Jurafsky. "Diachronic word embeddings reveal statistical laws of semantic change." In *Proceedings of the 54th annual meeting of the association for computational linguistics (volume 1: long papers)*, pp. 1489-1501. 2016.

Week of February 1

- Richard Futrell and Kyle Mahowald. "How linguistics learned to stop worrying and love the language models." *Behavioral and Brain Sciences* 49 (2026): e198.

Week of February 8

- Ethan Gotlieb Wilcox, Michael Y. Hu, Aaron Mueller, Alex Warstadt, Leshem Choshen, Chengxu Zhuang, Adina Williams, Ryan Cotterell, and Tal Linzen. "Bigger is not always better: The importance of human-scale language modeling for psycholinguistics." *Journal of Memory and Language* 144 (2025): 104650.

Week of February 15

- Dorottya Demszky, Nikhil Garg, Rob Voigt, James Zou, Jesse Shapiro, Matthew Gentzkow, and Dan Jurafsky. "Analyzing polarization in social media: Method and application to tweets on 21 mass shootings." In *Proceedings of the 2019 conference of the North American Chapter of the Association for Computational Linguistics: Human language technologies, volume 1 (long and short papers)*, pp. 2970-3005. 2019.

Week of February 22

- Danescu-Niculescu-Mizil, Cristian, Moritz Sudhof, Dan Jurafsky, Jure Leskovec, and Christopher Potts. "A computational approach to politeness with application to social factors." In *Proceedings of the 51st Annual Meeting of the Association for Computational Linguistics (Volume 1: Long Papers)*, pp. 250-259. 2013.

Week of March 1

- Zhivar Sourati, Farzan Karimi-Malekabadi, Meltem Ozcan, Colin McDaniel, Alireza Ziabari, Jackson Trager, Ala N. Tak, Meng Chen, Fred Morstatter, and Morteza Dehghani. "The shrinking landscape of linguistic diversity in the age of large language models." *Nature Human Behaviour* (2026): 1-18.

Week of March 15

- Julie Kallini, Isabel Papadimitriou, Richard Futrell, Kyle Mahowald, and Christopher Potts. "Mission: Impossible language models." In *Proceedings of the 62nd Annual Meeting of the Association for Computational Linguistics (Volume 1: Long Papers)*, pp. 14691-14714.

2024.

Week of March 22

- Jennifer Hu, Felix Sosa, and Tomer Ullman. "Re-evaluating theory of mind evaluation in large language models." *Philosophical Transactions B* 380, no. 1932 (2025): 20230499.

Week of March 29

- Jack Grieve, Sara Bartl, Matteo Fuoli, Jason Grafmiller, Weihang Huang, Alejandro Jawerbaum, Akira Murakami, Marcus Perlman, Dana Roemling, and Bodo Winter. "The sociolinguistic foundations of language modeling." *Frontiers in Artificial Intelligence* 7 (2025): 1472411.

Week of April 5

- Myra Cheng, Cinoo Lee, Pranav Khadpe, Sunny Yu, Dyllan Han, and Dan Jurafsky. "Sycophantic AI decreases prosocial intentions and promotes dependence." *Science* 391, no. 6792 (2026): eaec8352.

Week of April 12

- Shaw, Steven D., and Gideon Nave. "Thinking—fast, slow, and artificial: How AI is reshaping human reasoning and the rise of cognitive surrender." Manuscript available at SSRN 6097646 (2026).