

Linguistics 245
Language and Computers
Fall 2013

Course goals Present-day computer systems work with human language in many different forms, whether as stored data in the form of text, typed queries to a database or search engine, or speech commands in a voice-driven computer system. We also increasingly expect computers to produce human language, such as user-friendly error messages and synthesized speech. Through readings, exercises, demonstrations, and in-class discussion, this course will survey a range of issues relating natural language to computers, covering real-world applications.

Topics include text encoding, search technology, tools for writing support, machine translation, dialogue systems, and intelligent language tutoring systems.

There are no prerequisites for this course. This course satisfies a Natural and Mathematical Sciences (N&M) Breadth of Inquiry credit.

Meeting time: TR 9:30-10:45am

Classroom: Ballantine (BH) 118

Course website: <http://cl.indiana.edu/~md7/13/245/>

Assignments, slides, etc. will be posted here.

Credits: 3

Course prerequisites: None.

Instructor: Markus Dickinson

Office: Memorial Hall (MM) 317

Phone: 856-2535

E-mail: md7@indiana.edu

M 10am–11am

Office hours: R 11am–noon
or by appointment

Course requirements: There will be reading selections throughout the semester from a textbook. There will be approximately one exercise sheet, or homework, every two weeks. These assignments give you the opportunity to explore new aspects of the topics discussed in class, as well as to ensure that you are comprehending the material covered in class. Additionally, there will be in-class exercises which are included in your participation grade.

Readings: Required textbook:

- Markus Dickinson, Chris Brew, and Detmar Meurers (2013). *Language and Computers*. West Sussex, UK: Wiley-Blackwell.

For each unit, slides will be available from the webpage, generally before class. These slides are meant to aid classroom discussion and cannot replace actually being in class.

Grading: Grades will be based on classroom discussion/participation, homeworks, a midterm exam, and a final examination.

PARTICIPATION	8%	
HOMEWORKS	48%	(8@6% each)
MIDTERM	22%	Thursday, October 17 @ 9:30-10:45am
FINAL	22%	Thursday, December 17 @ 10:15am-12:15pm

- Homework assignments are due by the beginning of each class—please hand in a hard copy to me. You can work together on the homework assignments but write out your own answers in your own words. If you do work with someone, please note on your assignment who you worked with. Your homework grade will be based on both quality and effort.
 - Late Homework Policy: You will lose one (1) letter grade (10 percentage points) for every 24 hour period after the turn-in time.
- If you feel that I have graded anything incorrectly or improperly, please contact me outside of class. I will be happy to address your concerns.

Make-up Policy: If you plan on missing either the midterm or final, you will have to provide extensive documentation for your excuse. See me immediately if this is the case.

Academic Misconduct: Academic misconduct is not allowed in this course. The Indiana University *Code of Student Rights, Responsibilities, and Conduct* (<http://dsa.indiana.edu/Code/>) defines academic misconduct as “any activity that tends to undermine the academic integrity of the institution . . . Academic misconduct may involve human, hard-copy, or electronic resources . . . Academic misconduct includes, but is not limited to . . . cheating, fabrication, plagiarism, interference, violation of course rules, and facilitating academic misconduct” (II. G.1-6).

Students with Disabilities: Students who need an accommodation based on the impact of a disability should contact me to arrange an appointment as soon as possible to discuss the course format, to anticipate needs, and to explore potential accommodations.

I rely on Disability Services for Students for assistance in verifying the need for accommodations and developing accommodation strategies. Students who have not previously contacted Disability Services are encouraged to do so (812-855-7578; <http://www.indiana.edu/~iubdss/>).

Computational Linguistics: If you find yourself loving this material, I encourage you to come see me or Professor Sandra Kübler for more information about computational linguistics.

Schedule: Links to notes and homeworks will be posted on the course website.

Month	Date	Topic	Reading	Assignments
Aug.	27	Intro to class		
	29	Text & speech encoding	ch. 1, p. 1–17	
Sep.	3	Text & speech encoding	p. 17–28	
	5	Writers' aids: spelling correctors	ch. 2, p. 34–44	HW1 due
	10	Writers' aids: spelling correctors	p. 44–49	
	12	Writers' aids: grammar correctors	p. 49–65	
	17	Language Tutoring Systems	ch. 3, p. 69–76	HW2 due
	19	Language Tutoring Systems	p. 76–83	
	24	Language Tutoring Systems	p. 83–87	
	26	Searching	ch. 4, p. 91–100	
Oct.	1	Searching: internals	p. 100–107	HW3 due
	3	Searching: regular expressions	p. 107–120	
	8	Cryptography		
	10	Cryptography		HW4 due
	15	Midterm review		
	17	MIDTERM		MIDTERM
	22	Classifying documents	ch. 5, p. 127–133	
	24	Classifying documents	p. 133–140	
	29	Classifying documents	p. 140–151	
	31	Machine Translation (MT)	ch. 7, p. 181–191	HW5 due
Nov.	5	Machine Translation (MT)		
	7	Symbolic MT	p. 191–194	
	12	Statistical MT	p. 194–203	HW6 due
	14	Statistical MT	p. 204–209	
	19	Dialogue systems: dialogue	ch. 6, p. 153–166	
	21	Dialogue systems: chatterbots	p. 166–174	HW7 due
	26	<i>No class, Thanksgiving Break</i>		
	28	<i>No class, Thanksgiving Break</i>		
Dec.	3	Dialogue systems: modern systems	p. 174–177	
	5	Dialogue systems: modern systems		
	10	Impact of language technology use	ch. 8, p. 215–219	HW8 due
	12	Final review		
	17	FINAL: Tuesday, December 17		10:15am-12:15pm

Disclaimer This syllabus is subject to change. All important changes will be made in writing, with ample time for adjustment. (Midterm and final dates, however, will not change.)