LING 3250 Introduction to Computational Linguistics

Dr. Nick Danis, Washington University in St. Louis

Course number	LING 3250	*Instructor*	Nick Danis
Semester	Spring 2026	*Contact*	nsdanis@wustl.edu
Time	TR 10-11:20am	*Office*	January 206
Location	Rudolph 308	*Office hours*	TBD
Website	https://wustl.instructure.com/courses/168258		

This course introduces the computational tools, both practical and theoretical, to describe and analyze natural language. We will touch upon most of the major aspects of the field of computational linguistics and natural language processing, such as analysis of raw corpora; modeling phonological, morphological, & syntactic patterns; and learnability. We will use Python 3 throughout the course. This course is an introduction to these topics, and therefore no programming experience is required. Students, however, are encouraged to complete optional exercises and readings on basic programming techniques to aid in the completion of assignments and discussions. Prerequisite: LING 1600.

Goals

1. Learn practical, computational tools (e.g. Python NLTK) to manipulate natural language data
2. Understand the computational properties of natural language, independent of whether it is being computed by machines or humans (i.e. treating grammars as purely mathematical objects)
3. Apply these techniques to solve problems in phonology, morphology, and syntax

Required Materials

There are no required purchases for this course. Any readings will be made available online. Additionally, all software necessary is free as well. This course assumes you have (or have access to) a working computer with a desktop operating system (macOS, Windows, Linux, etc.). For those students working primarily off a Chromebook or iOS/Android device, there are cloud options available, though the mileage may vary. More details are given on Canvas.

Readings

A majority of the readings will come from the following source:

- Steven Bird et al. (2014). *Natural Language Processing with Python*. 2nd ed. http://www.nltk.org/book/

The entire second edition is available online at the link above; do not purchase a physical copy as the printed edition is the outdated first edition.

Software

All course material that is not a PDF is distributed in a Jupyter notebook for Python 3. If you are unsure what to install, or what this means, we will go over it the first week of class. There is detailed instructions on the Canvas site as well. The short version: we will use jupyterlab within miniconda.

Attendance and delivery

In-person attendance is required for this course. However, be smart and put your health first. If you think you need to miss class for a health-related issue, please try to contact me **before** class time. Class sessions are not recorded by default, but if you have an extended, excused period of absence, arrangements can be made. Attendance is taken every session in some form. A single unexcused absence will not count against your grade, but anything more will require documentation.

Grade

The final grade is weighted as follows.

Category	Weight
Participation and Discussion	20%
Weekly Assignments	60%
Final Project	20%

Once per week, usually Thursdays, there will be a participation notebook posted on Canvas. You will download this notebook and complete any practice exercises as we work through class, and upload it before you leave the classroom that day. These are graded as pass/fail and also count as your attendance for that day.

The weekly assignments are either quizzes/short assignments on Canvas itself, or jupyter notebooks containing more involved programming exercises. These are assigned roughly weekly, with a week off here and there. Always check Canvas for the latest schedule.

You should start thinking about the final project after the first few weeks. The project consists of a short proposal (2-3 paragraphs), and the project itself. The project is an annotated jupyter notebook with prose and code explaining the goal, methods, and results of your efforts. More information will be given in class.

Schedule

Please see Canvas for all readings and assignment due dates. The schedule is likely to change specific to how the course progresses, below is only a rough guide.

Date	Week	Topic	Comment
1/13/2026	01	No Class	Instructor Traveling
1/15/2026	01	introduction	
1/20/2026	02	scripting and control flow	
1/22/2026	02		
1/27/2026	03	regex and state machines	
1/29/2026	03		
2/3/2026	04	corpora and raw text	
2/5/2026	04		
2/10/2026	05	corpora and raw text ii	
2/12/2026	05		
2/17/2026	06	vectors, models, embeddings	
2/19/2026	06		
2/24/2026	07	maximum likelihood estimation	
2/26/2026	07		
3/3/2026	08	tfidf and document embedding	
3/5/2026	08		final project proposal due
3/10/2026	09	No Class	Spring Break
3/12/2026	09	No Class	Spring Break
3/17/2026	10	finite state machines	

Date	Week	Topic	Comment
3/19/2026	10		
3/24/2026	11	finite state transducers	
3/26/2026	11		
3/31/2026	12	context free grammers	
4/2/2026	12		
4/7/2026	13	context free grammars ii	
4/9/2026	13		
4/14/2026	14	special topics	
4/16/2026	14		
4/21/2026	15	special topics/presentations	presentations if time allows
4/23/2026	15		
TBD	16	Reading and Finals	final project due

Policy on the use of AI (sigh)

Large Language Model (LLM)-based artificial intelligence tools (ChatGPT, Copilot, Gemini, etc.) have become a ubiquitous, tempting, yet still often useful tool for a variety of tasks. As a university student, you should always know the following: never let LLMs be the final word. It is not an academic source, it hallucinates information, and it is not always true in even the most elementary sense. If you are using it as a brainstorm or study aid, *always* verify the output it gives you against trusted sources.

Further, as a student in this course, any and all work submitted by you must be original. Directly submitting the output of some LLM as your own constitutes a violation of the academic integrity policy. This includes blocks of code.

General policies

This course follows and takes seriously all policies on assault & harrassment, accommodations, academic integrity, and so on. In order to provide you with the most up to date material, I will link directly to the University guidelines below:

https://provost.wustl.edu/syllabi-resources-and-template-language-danforth-campus/

Please be familiar with these and don't hesitate to reach out if you ever have any related questions or concerns.

Academic Integrity

In all academic work, the ideas and contributions of others (including generative artificial intelligence) must be appropriately acknowledged and work that is presented as original must be, in fact, original. You should familiarize yourself with the appropriate academic integrity policies of your academic program(s).

Unauthorized Recording And Distribution Of Classroom Activities & Materials

Except as otherwise expressly authorized by the instructor or the university, students may not record, stream, reproduce, display, publish or further distribute any classroom activities or course materials. This includes lectures, class discussions, advising meetings, office hours, assessments,

problems, answers, presentations, slides, screenshots or other materials presented as part of the course. If a student with a disability wishes to request the use of assistive technology as a reasonable accommodation, the student must first contact the Office of Disability Resources to seek approval. If recording is permitted, unauthorized use or distribution of recordings is also prohibited.

Disability Resources (DR)
WashU supports the right of all enrolled students to an equitable educational opportunity and strives to create an inclusive learning environment. In the event the physical or online environment results in barriers to your inclusion due to a disability, please contact WashU's Disability Resources (DR) as soon as possible and engage in a process for determining and communicating reasonable accommodations. As soon as possible after receiving an accommodation from DR, send me your WashU Accommodation Letter. Remember that accommodations cannot be applied retroactively.

https://disability.wustl.edu/

Sexual Harassment And Assault
If you are a victim of sexual discrimination, harassment or violence, we encourage you to speak with someone as soon as possible. Understand that if you choose to speak to me as an instructor, I must report your disclosure to my department chair, dean, or the Gender Equity and Title IX Compliance Officer, which may trigger an investigation into the incident. You may also reach out to the Relationship & Sexual Violence Prevention (RSVP) Center to discuss your rights and your options with individuals who are not mandatory reporters.

https://titleix.wustl.edu/students/confidentiality-resources-support/

Religious Holidays
To ensure that accommodations may be made for students who miss class, assignments, or exams to observe a religious holiday, you must inform me in writing before the end of the third week of class, or as soon as possible if the holiday occurs during the first three weeks of the semester. For more information, please see the university's Religious Holiday Class Absence Policy (https://bulletin.wustl.edu/washu/calendar/Religious-Holidays.pdf).

Emergency Preparedness
Before an emergency affects our class, students can take steps to be prepared by downloading the WashU SAFE App (https://emergency.washu.edu/washu-alert-system/washusafe-app/). In addition, each classroom contains a "Quick Guide for Emergencies" near the door.

Resources for Students
WashU provides a wealth of support services that address academic, personal, and professional needs. To start exploring resources that can help you along the way, please visit: https://provost.washu.edu/resources/instructor-resources/student-resources/