Natural Language Processing

COSC 426L Section A

Instructor Info —

👤 Forrest Davis (he/him)

🕐 T: 3:30-5:00PM, W: 9:00-10:00AM, R: 12:30-1:30PM

📍 322 Bernstein

@ fdavis@colgate.edu

Course Info ———

📅 W

🕐 11:20AM-1:10PM

📍 118 Bernstein

Overview

Language is an amazing and intricate human capacity and building computational systems that process human language (Natural Language Processing; NLP) has widespread applications: both practical (e.g., searching the internet, virtual assistants, chatbots, autocorrect, translation systems, audio captioning, and hate speech detectors) and scientific (e.g., as models of the human mind). Coursework has three interrelated goals. First, to develop the language and tools necessary for understanding, building, and evaluating NLP systems. Second, to engage in the scientific process by reading papers, replicating existing results, developing research questions and running experiments to answer these questions. Third, to critically examine the broader impact of NLP systems on society.

Material

Required Text: There is no required textbook. Readings will be drawn from a variety of sources, including contemporary research. A wonderful resource (that we will also draw on) is Jurafsky and Martin's Speech and Language Processing.

Moodle Site: The course Moodle can be found here. We will also use Gradescope, which can be found here.

Course Site: The course site can be found here. It includes links to course materials and labs.

Schedule of Topics: A dynamic schedule of topics for my course section can be found here. The labs in that schedule correspond to this course's labs.

Coursework

Class

Each class meeting will be centered around a lab, which can be completed in groups. Groups are restricted to up to three students.

Lab Assignments

Lab assignments apply the concepts discussed/practice in class. There will be around 9 labs throughout the semester. Labs will be due Fridays at 11PM.

Policies

Attendance and Class Engagement

Attendance to lab is expected and contributes to your final grade. However, I do not expect you to attend if you are feeling unwell. Additionally, if you have athletics events, scheduled commitments, or other issues please let me know. If you accrue > 2 unapproved and/or unannounced absences, you will not receive attendance credit.

While in the lab, you are expected to engage with the material and the other students in the course. You should aim to be a good participant: raising your hand, respecting others, actively listening, and making sure to leave space for others to hold the floor.

Time Management and Deadlines

I will be reasonably flexible on deadlines. If you need some extra time due to illness, your workload in other classes, and/or personal matters, please let me know. As long as you have made a good faith effort to complete learning activities by the original deadline, I am willing to offer a reasonable extension. I will be less willing to grant an extension if you do not attend the lab, repeatedly ask for extensions, etc.

Any lab that is turned in late without prior approval will receive a 0%.

Academic Honesty & Collaboration

You are expected to abide by Colgate's academic honor code. Beyond the discussions that happen in the lab section (and with your group), you are not allowed to discuss specific solutions to the programming assignments or share your code with other students in any of the sections of this class (past or present). Assignment code should be discussed with the course TA or the instructors.

Using generative AI tools

Generative AI systems (e.g., ChatGPT), if used correctly, can serve as powerful tools for learning and idea refinement. In this course, you can use generative AI systems to learn about concepts iteratively through a interaction. However, you cannot ask these systems to directly give you answers or write code for you. That is, you should submit your own work. Here are some concrete rules that exemplify this (but are not intended to be comprehensive):

Do NOT:

- Give the model a problem description and ask it to sketch an algorithm for you or write you pseudo code.
- Give the model the lab description and ask it to organize the code for you (e.g., generate the necessary function headers, write the main functions etc).
- Give the model a function description and ask it to generate code for you.
- Interact with the model and have your assignment open at the same time. Use your interaction with the AI as a learning experience, then close the interaction down, open your assignment, and let your assignment reflect your revised knowledge

Using the AI system in ways as described above will count as cheating even if you cite the AI system as a source.

You CAN:

- Ask clarification questions about the fundamentals of programming (e.g., "How do I loop through a file in Python?")
- Ask for conceptual clarifications (e.g., "What is the difference between recall, precision, and F1?")
- Try to work through the logic of something you don't understand (e.g., "How does the gradient tell the model which direction to move in during optimization?")
- Given a problem description and your proposed algorithm and 'talk' through the potential fallacies.

Remember: Policies around the use of Generative AI tools, like any other course policies, vary across different courses both within and outside the department.

Anonymous Feedback

Your feedback on this course is important for helping me improve the learning environment. You can provide anonymous feedback at any point in the semester via this form.

Grading Scheme

Your course grade will be determined as follows (with equal weightings among the individual labs):

20%   Attendance and Lab Engagement

80%   Lab Assignments

Grading is on an absolute scale (i.e., no curve). Letter grades will be assigned as shown below. A grade of A+ is awarded when the student demonstrates truly exceptional performance and is not simply determined by having a high final grade. I reserve the right to make adjustments.

F	D-	D	D+	C-	C	C+	B-	B	B+	A-	A	A+
< 60	60 - 62	63 - 66	67 - 69	70 - 72	73 - 76	77 - 79	80 -82	83 - 86	87 - 89	90 - 92	$\geq$ 93	*

Getting Help

A key to your success at Colgate is figuring out what resources are available and using them to help you achieve your goals. There are several options for getting help with this course:

1. Drop in during my office hours (noted at the top of the syllabus) or if no office hours times work, arrange an appointment with me – just send me an email with a few times you are available, and we will find a time that works well for both of us.
2. Form a study group with other students in the class and work together on a regular basis (note the Academic Honesty & Collaboration policy above).
3. Attend TA office hours (to be announced).

I also encourage you to reach out to many great resources at Colgate that can assist you with academic, personal, or other needs, including:

- Administrative Deans (https://www.colgate.edu/about/offices-centers-institutes/dean-college/administrative-advising) help you understand policies and procedures, navigate personal challenges, work with faculty, and engage with parents.
- Counseling Center (https://colgate.edu/counseling) staff are trained to help students manage a wide array of emotions. The counseling center meets with over half the student body for clinical services at some point during their four years at Colgate. You can arrange an appointment online or by phone (315-228-7385). For emergencies, a counselor is available 24/7 by calling campus safety at 315-228-7333 and asking for the counselor on call.
- Haven (https://colgate.edu/haven) is a sexual violence response center that provides confidential care, support, advocacy, and trauma-informed clinical services for survivors of sexual assault, intimate partner violence, child/family abuse, stalking, and/or harassment. You can call (315-228-7385) or visit during business hours. You can also contact the Help Restore Hope Center (855-966-9723).
- Student Health Services (https://colgate.edu/offices-and-services/studenthealthservice) provides accessible, convenient, cost-effective, non-judgmental, and confidential care for all students.
- Information Technology Services (https://colgate.edu/its) help desk consultants assist all students with problems concerning email, Portal, Moodle, or your personal laptop. Contact me if problems with your personal computer are affecting your ability to get your work done.
- Chaplains (https://colgate.edu/campus-life/religious-life/officeofthechaplains) provide the community with a dynamic and friendly support.