XCS224U: Natural Language Understanding

Syllabus and Course Information

Welcome

Welcome to XCS224U: Natural Language Understanding! This professional course is based on graduate-level material from Stanford's on-campus course CS224U, adapted for a professional certificate format. In this course you will:

- Learn from Stanford classroom lecture videos (from Spring 2019 quarter) that have been edited and segmented by topic for easier navigation, reference, and review.
- Complete three guided homework assignments that lead to development of an original system of your own, and enter that system into a class-wide bakeoff.
- Complete a final project of your own choosing.
- Receive support from Stanford-affiliated Course Assistants.
- Connect to a cohort of peers from diverse locations and professional backgrounds.

Course Launch

All lecture videos and assignments will be available on the first day of the course **(February 24th) at 12:00pm Pacific Time**.

Getting Started

This course will use different tools to distribute content, run assignments, and deliver support. They are:

1) **SCPD Learning Management System** – accessed via the mystanfordconnection site which you used to apply to and enroll in this course.
2) **GitHub** – to distribute programming assignment code.
3) **Slack** – for additional course support and class discussions.

Joining Slack

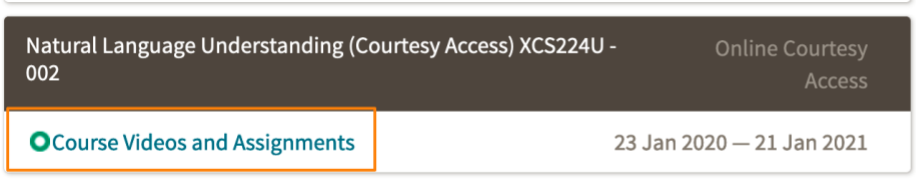
In addition to individual support from Course Facilitators (more details and guidelines in Course Facilitators, Support, and Guidelines section below), the cohort will have a Slack workspace to ask additional questions and discuss course topics. An email invitation to http://xcs224u-scpd.slack.com/ will be sent to your email address on file with SCPD on February 21, however if you encounter any troubles you can go directly to the workspace URL and request access as well.

GitHub

Course notebooks and homework will be posted in a public GitHub repository. (If you took XCS224N, this is different from the system for that course – the private team will not be needed). If you don't have one already, you should create a GitHub account to be able to access everything.

Accessing Your Course

1. On **February 24th after 12pm Pacific Time**, log in to the mystanfordconnection account you used when applying for the Artificial Intelligence Professional Program.
2. XCS224U: Natural Language Understanding will be visible as a live course. Click the link titled "Course Videos and Assignments" to enter our learning management system.



Course Calendar

Course modules are divided into two categories – core content and optional topics. Below is a ***potential*** pacing guide if you are interested in watching all videos within a 10-week window, while still leaving some flex time to solely dedicate to project work at the end. However, you are free to view the videos at any pace you'd like.

WEEK	POTENTIAL VIDEO PACING	ASSIGNMENTS	
1	Module 1: Distributed Word Representations		
2	Module 2: Relation Extraction	Homework 1 Due | Bake-off 1 Open	**MARCH 4**
3	Module 3: Natural Language Inference	Homework 2 Due | Bake-off 2 Open | Bake-off 1 Close	**MARCH 11**
4	Module 4: Methods and Metrics	Homework 3 Due | Bake-off 3 Open | Bake-off 2 Close	**MARCH 18**
	Module 5: Writing Up and Presenting Your Work	Bake-off 3 Close	**MARCH 25**
5	*(Optional But Recommended) – Module 6: Supervised Sentiment Analysis*	Project Kick-off Webinar with Prof. Potts (TBD)	
6	*(Optional But Recommended) – Module 7: Grounded Language Understanding*	Literature Review Due	**APRIL 5**
7	*(Optional But Recommended) – Module 8: Semantic Parsing*		
8	*(Optional But Recommended) – Module 9: Contextual Word Representation*	Experimental Protocol Due	**APRIL 15**
9			
10			
		Final Paper Due	**MAY 3**

Honor Code

Students are asked to review and maintain the standards set forth by the Stanford Honor Code when completing assignments and the final project in this course. You can review the section labeled *Violations of the Honor Code* for representative examples relevant to this course.

Assignments

There are three regular assignments in the course. Each assignment comes in pairs of homeworks and bake-offs and follow a common pattern:

1. In the homework, you build some baseline models and develop your own model, and this accounts for 9 of the 10 points.
2. In the associated bake-off, you enter your model into a competition centered around evaluation on a previously unseen test set. All entries get the additional 1 point, and top entries receive a bit of extra credit. You will run your bake-off submission locally and submit your own results. To maintain the integrity of the challenge, you are asked to not modify your model in between the original homework due date and the bake-off submission date. This will be spot checked by CFs but primarily be run on the honor system.

Course Facilitators will evaluate bake-off result submissions, analyze results, and create a report/summary highlighting key takeaways.

Late Assignments and One-time Extension

Late homeworks are assessed a penalty of **one point per day late, up to a maximum of five days late at which point the submission link will close**. Late bake-off submissions are not accepted.

We understand that personal or professional events may cause you to miss a deadline on a homework. Each student is able to use a **one-time, five-day extension on a homework, which will not be assessed a scoring penalty**. The extension cannot be split into smaller parts (e.g. you cannot use two days on Homework 1 and three days on Homework 3.). In order to use your extension, contact your Course Facilitator and SCPD staff.

Project

The second half of the course is devoted to completion of a final project. Projects are required to be related in a substantive way to at least one of the topics of the course. The course contains additional lectures, readings, and other resources on methods, metrics, and best practices for completing and presenting a project. The project is divided into three parts:

- Literature Review
- Experimental Protocol
- Final Paper

Further details about each project component will be provided in the SCPD learning portal accessed at course launch.

Project Teams

Final projects can be done in groups of 1–3 people; in our experience, groups of 3 lead to the best outcomes, so we encourage you to form a team of that size. There will be a Slack channel dedicated to connection and discussion among people who are interested in finding teammates.

Passing the Course and Earning the Certificate

In order to earn the Certificate of Achievement associated with this course, you must complete the assignments and project with a score of 70% or higher. Once you have successfully completed the course and the post-class survey, a digital Record of Completion will be emailed to you and the Certificate of Achievement will be mailed in approximately two weeks. The grading will be calculated as follows:

- Homeworks and Bake-offs: 30 points
- Literature Review: 20 points
- Experimental Protocol: 20 points
- Final Project Paper: 30 points

100 points total for the course.

Videos and Slides

As noted, this course utilizes content originally delivered in the CS224U graduate course. A few things you will notice about this adaptation process:

- At times you will hear instructors make reference to the final presentation video. This assignment has been removed for the current version of XCS224U and you need not worry about the reference.
- Instructors may make reference to “Week 1”, “Week 2”, “Week n” of the course – do not worry about these references. The order of the course has been rearranged from its original delivery to better streamline the experience for the AI Professional Certificate Program format.
- In some sections you will see that the slide numbers in the downloadable decks do not exactly match the videos. This is due to the fact that some decks were updated/corrected over time – while the downloadable decks reflect these corrections, the originally delivered classroom lectures do not.
- In a few specific cases you may see names and/or faces blurred. In general this is usually due to guidelines regarding student privacy.

Course Facilitators, Support, and Guidelines

You have a wide range of support available to you throughout the course. You will be assigned and receive contact information for an individual Course Faciltiator (CF) who will act as your primary point of contact.

Below is a summary of the available resources and course support:

Office Hours

Your CF will be in touch with availability and scheduling logistics for video conference office hours. Office hours may be conducted using the Zoom conference service or via Slack video (more information below on the course Slack workspace). Your CF will provide further information on how they will schedule and run office hour sessions.

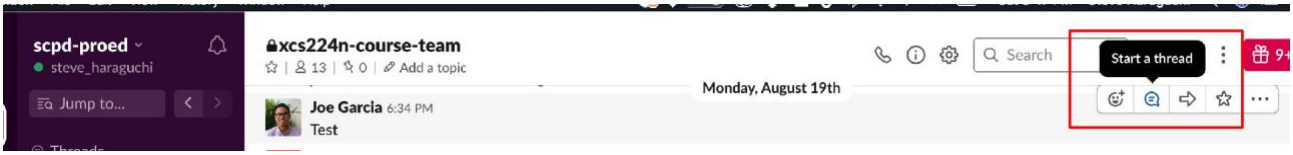
Email

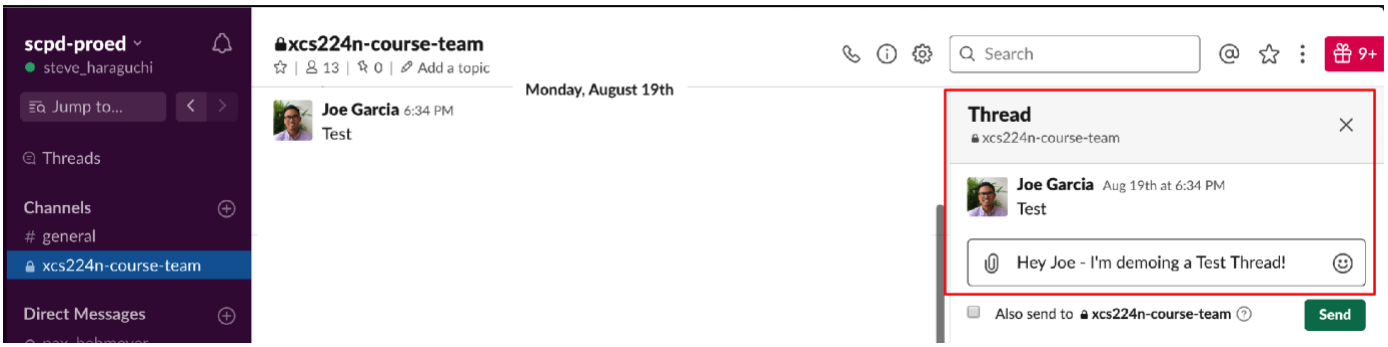
Your CF will also be available to answer questions via email – a Stanford contact address will be provided when you are first connected to your CF.

Slack Workspace – Usage and Guidelines

In addition to the individual and small group support provided by CFs, Slack will be a place where questions may be posed to the entire community (this is the fastest way to get an answer!). **In order to keep the Slack workspace readable, searchable, and useful to all, please follow the following guidelines:**

Reply in Threads to Keep Conversation Organized – When you are replying to a post or joining a conversation, respond by starting or joining a threaded conversation, rather than responding in the full flow of the standard timeline. See below for an example of how to respond in a threaded conversation to Joe's test message:





Use Multi-line Messages – Even if messages are threaded, you will soon see that Slack becomes unmanageable unless people use **single, multi-line messages instead of multiple, single-line messages**. Especially for mobile Slack users, it gets out of control!

Rather than the following:
"Hey all I have a question" [RETURN] <-- Creates new message
"I am a little confused about the quiz" [RETURN] <-- Creates new message
"I'm getting F for Question 40, but it seems like T is better" [RETURN] <-- Creates new message
---
Instead, try this!
"Hey all I have a question" [SHIFT+RETURN] <-- Creates new line in SAME message
"I am a little confused about the quiz" [SHIFT+RETURN] <-- Creates new line in SAME message
"I'm getting F for Question 40, but it seems like T is better" [SHIFT+RETURN] <-- Creates new line in SAME message
{RETURN} <-- Posts message

Note on Code Assignments and Debugging

While the course team is here to help and support your experience, it is ultimately your responsibility to write, test, and de-bug your own coding assignments. CFs may view and provide guidance on your work, however they will not send you exact answers on what to insert into your assignments. **Additionally, before reaching out to a CF or Slack for help, it's expected that you have taken the reasonable steps of searching the internet for answers/clues and performing an analysis yourself**. This policy is meant to ensure that you leave the course having mastered the material and enable CFs to focus attention on questions where their guidance is most impactful.

Note on Course Facilitator Assignments + Projects

Your CF may change once you have officially formed/selected a project team after the three homework assignments have been completed. For example, if a team of three forms but each of the three individuals comes from a different CF group, the SCPD team will work to 're-appoint' a single CF point of contact for that team, based on load balances across the cohort.

Questions and Contacts

For course-specific questions or concerns (content, assignments, CF support), please contact your designated Course Facilitator.

For questions on tuition, payments, certificates, and account access, please contact Student and Client Services at scpd-ai-proed@stanford.edu.