Course Syllabus

CS 4379Q/5369Q: Recommender Systems

Course Information

This course covers the basic concepts of recommender systems, including personalization algorithms, evaluation tools, and user experiences. We will discuss how recommender systems are deployed in e-commerce sites, social networks, and many other online systems. Additionally, we will review current research in the field.

Course Title CS 4379Q: Introduction to Recommender Systems

CS 5369Q: Recommender Systems

Schedule Tuesdays and Thursdays, 9:30–10:50 AM

Prerequisites CS 3358 with a C or higher.

Readings *Introduction to Recommender Systems* (online course materials on Coursera)

Recommender Systems: An Introduction (optional textbook)

Collaborative Filtering Recommender Systems

Additional research papers and online articles

Web site TRACS

Software LensKit, Java

Instructor

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Office hours M 10AM–noon, TR 2–3PM, F 11AM–noon in Comal 307F

Course Structure

This course is built on the content of the *Introduction to Recommender Systems* course on Coursera, using that instead of a traditional textbook. You will need a Coursera account to access the online course materials. There is no charge for this account.

The online videos are the primary means of delivering core content. **You are responsible for watching all videos.** You are also encouraged to complete the assignments and exams on

Coursera to practice and better understand the material, but they will not factor into your grade.

We will be using the class time for supplementary lectures, discussions of the readings and other topics, and group project work.

The work in this course falls into several categories:

- **Reading reports** ask you to briefly summarize a research paper from the readings.
- A group **analysis and design project** to design a recommender system application.
- Individual **assignments** to give you experience building and testing recommender systems.
- For graduate students, a **research project** to understand, communicate, and extend recent recommender systems research.
- Midterm and final exams.

They will factor into your final grade as follows:

Category	4379Q %	5369Q %
Reading reports	5	5
Assignments	50	40
Design Project	20	15
Exams	25	20
Research Project	N/A	20

The standard 70/80/90 scale determines the minimum grade you will receive (that is, if you have 80 total course points, you will receive at least a B).

Readings and Reports

The Coursera course has a number of research papers and other articles to read; all of those are considered course readings and you are expected to be familiar with them. Material from readings that are not labeled 'recommended', 'suggested', or 'supplemental' may appear on exams.

In addition, there is a selection of research papers in the detailed course schedule. Some of these overlap with the Coursera readings, so it is not an entirely new set of readings. We will discuss some of these readings in class.

These readings will also form the basis of the Reading Reports. Each reading has an associated Reading Report assignment. For the reading report, write 2–3 paragraphs briefly addressing the following:

- What question is the paper trying to answer, or what problem is it trying to solve?

- What is the key idea of the solution or experimental method?
- What are the main lessons from the paper?

In addition to the assigned course readings, I expect graduate students to find and read some additional research papers. Graduate students must submit **12 reading reports**: 10 from the assigned readings, and 2 from additional research papers.

Undergraduate students need to submit **5 reading reports** on assigned readings.

Do not neglect the reading reports. The research project will be *much* easier if you are being faithful in doing the readings and their reports.

I also encourage you to discuss the readings with your fellow students in advance of class; you may even do this before submitting the reading reports.

Analysis and Design Project

Throughout the semester, you will work with a group of 3–4 on a 2-part group project. The first will consist of an analysis of several recommender services, and the second will be a recommender application design.

The design project will not involve significant programming, other than to do some preliminary experimentation with recommender ideas. The outcome of this project will be a design brief outlining several aspects of the design of a new recommender system application. More details, along with deliverables and their due dates, will be announced by the end of week 4.

You may select your own groups for this assignment, but each group must have both graduate and undergraduate students.

At the end of the semester, each group will present its design to the course.

Assignments

Each module, except the last, will have an assignment (6 assignments). The assignment will be available at or before the date we begin the module. The assignments will involve programming and/or testing recommender systems using the LensKit toolkit.

Each assignment is due at **9AM on Tuesday** of the beginning of the next module.

Each assignment must be completed individually. You may discuss the assignment with your fellow students, particularly those in your group, but all code and results you turn in must be your own.

I suggest that you watch the videos early in the module so you have time to work on the assignment.

Research Project

Graduate students are required to also complete a research project. More information will be available in the project description, but at a high level, there are two options:

- A survey and research proposal, surveying and summarizing at least 4 research papers and proposing a new experiment to extend their results or answer new questions they raise.
- A replication study, where you attempt to reproduce a recent recommender systems algorithm or experiment paper.

You may work with a partner on this project.

Each group will present on its research project at the end of the semester.

Course Outline

Here's the expected schedule. It may be adjusted somewhat as we progress through the semester.

Week	Date	Mod	Topic	Assignment
1	1/19	1	Introduction	
2	1/26	2	Non-Personalized Recommendation	A1
3	2/2	3	Content-Based Recommendation	A2
4	2/9			
5	2/16	4	User-Based Collaborative Filtering	A3
6	2/23			
7	3/2	5	Evaluation	A4
8	3/9		**Midterm**	
	3/16		*Spring Break*	
9	3/23	6	Item-Based CF	A5
10	3/30			
11	4/6	7	Matrix Factorization	A6
12	4/13			
13	4/20	8	Advanced Topics / Design Presentations	Design & Research Projects
14	4/27		Research Presentations	
F	5/4		Finals Week (Final **May 12, 8AM**)	

Course Policies

Attendance

I encourage you to attend all class sessions, but ordinary lecture attendance will not directly affect your grade. You do need to be present for all exams as well as the presentation days.

Some lectures will be on Java programming to prepare you for the assignments; I will announce in advance those lectures, so that you can skip them if you already know Java. They will most likely be in weeks 2–4.

Late Work

For the **assignments**, you have 3 'late days' that you may use throughout the semester at your discretion. Notify the instructor before the assignment's due date if you intend to take a late day; if an emergency arises so that you cannot do so, notify the instructor at your earliest opportunity. Late assignments without late days remaining will receive no credit.

For the **project deliverables**, each deliverable must be submitted on time. Deliverables will be accepted up to 24 hours late with a 25% grade penalty.

Late reading reports are not accepted, but only the required number of reading reports will affect your grade.

The mid-term and final exams will be at the published times. Makeup exams will only be given in exceptional circumstances.

Cheating and Academic Integrity

As both a programmer and a student, you are expected to do your own work, attribute sources, and respect the legal and moral rights of others with respect to their work; as a student, you are also required to abide by the University honor Code. While I aim to allow you to make reasonable use of resources, cheating (including copying code, using unauthorized resources during tests, etc.) will not be tolerated. If you are found to be cheating, the penalty may range from an F on the assignment to an F on the course, and will also be reported to the university.

External Resources

You may consult external resources such as other books and web sites for understanding how to solve homework problems or portions of the project. In your assignment solution, list all external resources you used; if they are available online, provide the URL. You do not need to cite the textbook, or the official documentation for the software we are using (Java, LensKit, and the libraries used by LensKit).

Besides the course forum, you may ask questions related to the course material and concepts required to complete the work on publicly accessible discussion forums such as Stack Over-

flow, newsgroups, or publicly-archived mailing lists[1]. Provide URLs to the forum discussion on the relevant web site or archive (Google Groups works well for newsgroup archives) with your project deliverable submission. When you ask a question for one of the assignments, mention that it is for a course project and that your instructor permits you to make reasonable use of discussion forums.

Restrict your questions to questions about how to go about a particular sub-portion of the problem, how something works, why something you are trying doesn't work, or other specific difficulties. Do not ask "how do I solve <the problem description>?", or similarly direct translations of the project requirements, or for specific code. Questions should be written to fill in a gap in your understanding that will then enable you to continue your work, not to get a solution to the assignment.

Conduct

You are expected to behave in a civil, respectful manner in all class interactions, both in official meetings such as lectures and out-of-classroom activities such as project group meetings and study sessions, and to contribute to a constructive learning environment.

Texas State policy (PPS 4.02) describes general behaviors that are disruptive. In addition, the Hacker School Social Rules are a good source of guidance on how to maintain a constructive and educational environment.

If you experience or witness harassment of any form, please let me know.

Disability Accommodations

If you need particular accommodations to be able to fully participate in this course, please talk with me as soon as possible. I may ask that you provide documentation from the Office of Disability Services, so if you have such documentation please bring it.

[1] Sites that require registration, login, and/or payment to view content, such as Quora or Experts Exchange, do not qualify as publicly-available. Also, services that do not have public archives, even if they are open to the public, are not appropriate; please don't use IRC unless it's a channel with public logs, and you can provide a link to the relevant logs.