Course Syllabus for SIADS 685: Search and Recommender Systems

Course Overview and Prerequisites

The prerequisites for SIADS 685 include:

- Advisory Prerequisites: SIADS 642: Deep learning, SIADS 652: Network analysis, SIADS 655: Applied NLP, SIADS 611: Database Architecture and Technology
- Enforced Prerequisites: SIADS 694 (first half of Milestone II)

Instructor and Course Assistants

- Instructor: Michelle LeBlanc (mdlb@umich.edu Opens in a new tab)
- Course Support: Sharon Sung (sungsh@umich.edu Opens in a new tab), Toby Kemp (tobyk@umich.edu Opens in a new tab)

Course Communication Expectations

- Please use the pinned posts in the course Slack channel to ask questions about lecture topics or assignments.
- If you need to DM the teaching team, please include the entire group: **@Sharon Sung**, **@Toby Kemp**, and **@Michelle LeBlanc**. If you only message one of us, we will probably ask you to resend it to the group. We aim to respond within 24 hours.
- If you have a private, personal matter to discuss, please DM **@Michelle LeBlanc**, otherwise send your questions to the entire teaching team.
- **Weekly office hours: Thursdays at 8 pm EST with Michelle LeBlanc and Sundays 10 am EST with Toby Kemp**
- Passcode for all office hours is **685**

How to Get Help

If you have questions concerning the degree program, encounter a technical issue with Coursera, or issues using Slack, please submit a report to the ticketing system at umsimadshelp@umich.edu Opens in a new tab .

If you have an issue specific to the Coursera environment, you can also begin a live chat session Opens in a new tab with Coursera Technical Support (24/7) or view Coursera troubleshooting guides Opens in a new tab . (you may be asked to log in to your Coursera account).

Weekly Readings or Textbook Information

Week 1: Introduction to Information Retrieval, Search Engine Architecture

Reading: Q. Mei and D. Radev, " Information Retrieval Opens in a new tab ", Chapter in The Oxford Handbook of Computational Linguistics 2nd edition

Reading: (Optional) C.Zhai and S.Massung, " Text Data Management and Analysis - A Practical Introduction to Information Retrieval and Text Mining Opens in a new tab ", Chapter 5, 8, 9 (parts)

Week 2: Retrieval Models, Web Search (Part I)

Reading: Q. Mei and D. Radev, " Information Retrieval Opens in a new tab ", Chapter in The Oxford Handbook of Computational Linguistics 2nd edition

Reading: C.Zhai and S.Massung, " Text Data Management and Analysis - A Practical Introduction to Information Retrieval and Text Mining Opens in a new tab ", Chapter 6, 7, 10

Week 3: Web Search (Part II), Content-based Filtering

Reading: C.Zhai and S.Massung, Text Data Management and Analysis - A Practical Introduction to Information Retrieval and Text Mining Opens in a new tab , Chapter 10, 11

Week 4: Collaborative Filtering, Recommender Systems

Reading: C.Zhai and S.Massung, Text Data Management and Analysis - A Practical Introduction to Information Retrieval and Text Mining Opens in a new tab , Chapter 11

To access the required textbooks, simply click on the links above and login with your UMich LoginID and Password.

Refer to course shell for optional and further readings.

Learning Outcomes

1. Know the difference between search, adaptive filtering, and collaborative filtering.
2. Know the concept and rationale behind ranking (compared with classification), and be able to evaluate a ranking algorithm using appropriate metrics
3. Understand the basic architecture of a search engine, be able to build an inverted index of a large text collection and retrieve documents using a vector space model
4. Be able to build an adaptive filtering system using a classifier or a ranker on a data stream
5. Be able to construct a collaborative filtering algorithm using memory-based approach
6. Know how matrix factorization techniques are applied to search and recommendation
7. Be able to name popular applications of information retrieval and filtering in industry and articulate their specific challenges
8. Know advanced machine learning models can be used to improve the accuracy of search and recommender systems

Course Schedule

- **This course begins on January 9, 2024, and ends on February 5, 2024 (last assignments due on February 5 -- see Grading schedule below)**
- Weekly assignments will be **due on Mondays at 11:59 pm** (Ann Arbor, Michigan time-Eastern Daylight Time - EDT, UTC -4).

Weekly Office Hours via Zoom (Ann Arbor, Michigan time):

Your instructor will hold weekly, synchronous office hours using the video-conferencing tool, Zoom. The schedule of office hours can be found by clicking on the **Live Events** link in the left-hand navigation menu.

Grading

Course Item	Number of Points	Percentage of Final Grade	Due (see late submission policy below)
Week 1 Notebook Assignment	100	25%	Monday, January 15 - 11:59 pm Eastern
Week 2 Notebook Assignment	100	25%	Monday, January 22 - 11:59 pm - Eastern
Week 3 Notebook Assignment	100	25%	Monday, January 29 - 11:59 pm Eastern
Week 4 Notebook Assignment	100	25%	Monday, February 5 - 11:59 pm Eastern
Total	400	**100%**	

Note: All assignments are required to earn credit for this course.

Letter Grades, Course Grades, and Late Submission Policy

Refer to the MADS Assignment Submission and Grading Policies Opens in a new tab section of the UMSI Student Handbook (access to Student Orientation course required).

You have a total of two (2) free late days to use during the course, where each late day is a 24 hour extension of the due date and time. Late days are always full 24 hours periods - no fractional days. You **do not** need to explain or get permission to use late days, but you are

responsible for designating which week(s) you wish to have the late day(s) applied. Upon completion of all assignments, please DM the full instructional team with your desired application of late days. You do not need to pass each individual assignment to pass the class.

The grading scale for this course is as follows:

A+ 97%
A 93%
A- 90%
B+ 87%
B 83%
B- 80%
C+ 77%
C 73%
C- 70%
D+ 67%
D 63%
D- 60%
F 0%

Academic Integrity/Code of Conduct

Refer to the Academic and Professional Integrity Opens in a new tab section of the UMSI Student Handbook. (access to Student Orientation course required).

Accommodations

Refer to the Accommodations for Students with Disabilities Opens in a new tab section of the UMSI Student Handbook (access to the Student Orientation course required).

Use the Student Application Form in Accommodate Opens in a new tab to begin the process of working with the University's Office of Services for Students with Disabilities.

Accessibility

Refer to the Screen reader configuration for Jupyter Notebook Content Opens in a new tab document to learn accessibility tips for Jupyter Notebooks.

Library Access

Refer to the U-M Library's information sheet Opens in a new tab on accessing library resources from off-campus. For more information regarding library support services, please refer to the U-M Library Resources Opens in a new tab section of the UMSI Student Handbook (access to the Student Orientation course required).

Student Mental Health

Refer to the University's Resources for Stress and Mental Health website Opens in a new tab for a listing of resources for students.

Student Services

Refer to the Introduction to UMSI Student Life Opens in a new tab section of the UMSI Student Handbook (access to the Student Orientation course required).

Technology Tips

- Recommended Technology
- This program requires Jupyter Notebook for completion of problem sets and Adobe or other PDF viewer for reading articles.
- Working Offline
- While the Coursera platform has an integrated Jupyter Notebook system, you can work offline on your own computer by installing Python 3.5+ and the Jupyter software packages, including pyspark. For more details, consult the Jupyter Notebook FAQ Opens in a new tab .