MIE451/1513: Decision Support Systems

Instructor:	Prof. Scott Sanner, BA8104, ssanner@mie.utoronto.ca
Office hours:	Monday 18:00-18:50 in BA8104; Wednesday, 18:00-18:50 in BA8104
Prerequisites:	MIE253 and MIE350 (or equivalent)
Lectures:	Monday, 14:10-16:00 in GB220; Wednesday 13:10-14:00 in GB220
Lab and Practical:	Thursday, 16:10-18:00 in RS303 (Eldan, Wuga, Kasra)
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Course description

This course provides students with an understanding of the role of a decision support system in an organization, its components, and the theories and techniques used to construct them. The course will cover basic technologies for information analysis, knowledge-based problem solving methods such as heuristic search, automated deduction, constraint satisfaction, and natural language understanding.

Course structure

Lecture	Learn about Decision Support Systems from an *Information Engineering* perspective
Lab	Learn how to use Python-based tools to support lecture and project topics

Course goals

Become proficient with engineering and analysis tools for data-driven Decision Support Systems:

- Understand search engines, ranking, and evaluation.
- Understand the machine learning concepts of classification and clustering.
- Understand the text processing pipeline from documents through to basic linguistic analysis.
- Understand the fundamentals of recommender systems.
- Understand basic principles of data science and data visualization.
- Understand how to derive informative measurements from social networks.
- Understand the fundamentals of "Big Data" processing.
- Apply all of the above in Python. Why Python?
  - Rich libraries make it tool of choice for data analysis in industry
  - Portable (not OS dependent) and shareable (e.g., IPython)

Grading

Assignment	Weight	Date
Python Warmup	5%	Week 2 (Friday, Sept 21)
Project 1 (Information Retrieval)	7%	Week 4 (Friday, Oct 5)
Project 2 (Machine Learning)	7%	Week 6 (Friday, Oct 19)
Midterm exam	25%	Week 7 (**tentative**)
Project 3 (Recommender Systems)	7%	Week 8 (Friday, Nov 2)
Project 4 (Text Mining/Analysis)	7%	Week 10 (Friday, Nov 16)
Project 5 (Conversational Interfaces)	7%	Week 12 (Friday, Nov 30)
Final exam	35%	Finals week

Projects are due on Friday at 10:00pm of the week listed unless otherwise stated.

Project submissions:

- Project submissions will be online through github (instructions provided in lab).
- Projects up to 24h late will be given a 30% penalty.

Academic honesty

The following constitute plagiarism on project submissions:

- Copying any segment of code from any source
- Submitting code that you did not write yourself personally

Students suspected of plagiarism on an assignment will be referred to the department for formal discipline for breaches of the Student Code of Conduct.

Student responsibilities

- Don't talk or otherwise cause distractions in lecture.
- Attend lab and tutorial: they are needed for projects and attendance will be taken.
- Ask questions in class, lab, office hours, or on Quercus.
  - **Personal email responses will be "ask on Quercus" or "see me in class".**

Preliminary Schedule of topics

The schedule of topics below is subject to change. DSS = Decision Support Systems, IR = Information Retrieval, ML = Machine Learning, REC = Recommender Systems, TM = Text Mining, DS = Data Science, CI = Conversational Interfaces, SNA = Social Network Analysis.

The following schedule of topics is subject to change without notice:

Week	Lecture	Lab / Practical Topic	Due
1 (Sep 10)	Course Overview, Intro to DSS	MS Azure, Python Intro	
2 (Sep 17)	IR (Indexing and Retrieval)	More Python, github	Python Warmup
3 (Sep 24)	IR (Evaluation)	Project 1	
4 (Oct 1)	ML (Classification)	Project 1	Project 1
5 (Oct 8)	ML (Clustering)	Project 2	
6 (Oct 15)	REC (Nearest Neighbor)	Project 2	Project 2
7 (Oct 22)	TM (Document Processing)	Project 3	
8 (Oct 29)	TM (Linguistic Processing)	Project 3	Project 3
9 (Nov 5)	DS (Basic Data Science)	Project 4	
10 (Nov 12)	DS (Data Visualization)	Project 4	Project 4
11 (Nov 19)	CI (Conversational Interfaces)	Project 5	
12 (Nov 26)	SNA (Social Network Analysis)	Project 5	Project 5
13 (Dec 3)	Related DSS Topics, Review	No Lab	

MIE Safety Training

All MIE students are required to complete on-line Health and Safety training in order to maintain lab access. All students should have received an email notification for this — further information can be found at the following URL: https://safetytraining.engineering.utoronto.ca/MIE/