STA 130S: An Introduction to Statistical Reasoning and Data Science (Winter 2017)

This course, intended for students considering a program in Statistical Sciences, discusses the crucial role played by statistical reasoning in solving challenging problems from natural science, social science, technology, health care, and public policy, using a combination of logical thinking, mathematics, computer simulation, and oral and written discussion and analysis. (**Warning:** This is **not** a conventional "Introductory Statistics course"; for that you should instead take e.g. STA220H1.) [See also the evolving lecture notes.]

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Course Web Page: Visit www.probability.ca/sta130 for course information and documents.

Lectures: Mondays, 2:10 - 4:00 p.m., in room 252 of the Mechanical Engineering Building (building "MC" on campus map). First lecture Jan 9, last lecture April 3, no lecture Feb 20 (Family Day). During lectures, please **put away your laptops and cell phones** (unless you are using them specifically for a class-related purpose, with permission), and **pay attention** to the material being presented.

Tutorials: Wednesdays, 2:10 - 4:00 p.m., in various locations, as specified in your online registration. First tutorial Jan 11, last tutorial April 5, no tutorial Feb 22 (Reading Week).

Office Hours: The instructor and TAs will all be available after every class, so please come talk to us! We will also be arranging additional office hours, including before the test and exam. You can also e-mail us any time, to ask questions or arrange one-on-one meetings (for best results, put "STA130" in the subject line).

Corequisite: MAT136H1 / MAT137Y1 / MAT157Y1.

Exclusion: Any of STA220H1/STA255H1/STA248H1/STA261H1/ECO220Y1/ECO227Y1 taken previously or concurrently.

Evaluation:
16% Midterm [sol] (2:10-4:00 on Mon Feb 13, in the usual MC252 classroom);
35% Final Exam (some time during April 10-28; date and location T.B.A.);
5% Attendance and Attention in lectures;
10% Oral Participation (and preparation) during tutorials;
8% Quizzes (in tutorials);
8% Homework assignments (HW#1 due Feb 1, HW#2 due Feb 27, HW#3 due March 8);
10% Professional Report (due Mar 20 and Apr 5; see grading rubric);
3% Professional Presentation (on Mar 22 or 29);
3% Mentorship participation (to be explained on Feb 1);

2% External Event attendance (to be explained on Feb 1).
Note: On the midterm and exam, **BRING YOUR STUDENT CARD AND CALCULATOR**, and **DO NOT SIT NEXT TO ANYONE THAT YOU KNOW**.

Communication: This course will require students to **communicate** well in both written and spoken English, including written answers on the quizzes/test/exam, and oral discussions and presentations in tutorials. Students desiring help may wish to avail themselves of the resources available at: http://www.writing.utoronto.ca/ and http://www.writing.utoronto.ca/writing-centres/arts-and-science and http://www.artsci.utoronto.ca/current/advising/ell; see also these speaking skills.

Computing: Students will be required to do some homework assignments using a computer running the statistical software package "R", which is available to download for free onto any computer or to use in campus labs; see probability.ca/Rinfo.html for more information.

Calculators: On the test and exam and **some** quizzes, you will be permitted to use a simple (non-programmable, non-graphing, non-cell-phone) **calculator**, so please obtain one. (Don't worry, they're cheap.) You will be provided with a standard normal probability table.

Further Reading: There is no formal textbook for this course. However, for extra reading, there are many traditional textbooks that cover most of the material in the course (though perhaps in a somewhat different way), such as:

- *Introduction to the Practice of Statistics*, by David S. Moore and George P. McCabe. (Any edition will do.)
- *Stats: Data and Models, Canadian edition*, by Richard D. De Veaux, Paul F. Velleman, David E. Bock, Augustin M. Vukov, and Augustine C.M. Wong.
- *Statistics*, by David Freedman, Robert Pisani, and Roger Purves.

There are also many free textbooks and other information available online, such as:

- OpenIntro Statistics, by David M. Diez, Christopher D. Barr, and Mine Cetinkaya-Rundel
- Online Statistics Education, by David M. Lane, David Scott, Mikki Hebi, Rudy Guerra, Dan Osherson, and Heidi Zimmer
- HyperStat Online, by David M. Lane
- StatPrimer, by B. Burt Gerstman
- Khan Academy: Statistics and Probability

Lateness policy: Homeworks are due at 2:10pm **sharp**. Lateness penalties are: 1-10 mins = 10% of the total grade; 11-30 mins = 20%; 31-90 mins = 30%; 91 mins - 24 hours = 40%; longer = homework not accepted.

Regrading policy: Regrading requests should only be made for **genuine grading errors**, and should be initiated by writing or typing a complete explanation of your concern (together with your full name, student number, e-mail address, and telephone number) on a **separate piece of paper**, and giving this together with your original **unaltered** quiz/homework/test paper **to the professor** within one week of when the graded homework or test was first available. **Warning: your mark may end up going down rather than up.** (Note: for the final exam, a different Faculty-wide process is followed.)

This document is available at www.probability.ca/sta130 or permanently at www.probability.ca/jeff/teaching/1617/sta130/