SOCI 620: Quantitative Methods 2

Location	Onliine
Time	Winter 2022, Tue and Thu 4:05–5:25pm
Instructor	Peter McMahan (peter.mcmahan@mcgill.ca
Office hours	Wednesdays 1:30–3:00pm Zoom
Lab sessions	TBA
Syllabus	https://soci620.netlify.com/

Description

question, a brief description of the data that will be used, and an outline of the analytical strategy that will be employed. The purpose of the precis is to motivate the project and to establish its feasibility, not to perform any analyses or to answer any research questions.

2. Proposal (Due March 30): Based on the feedback received from the precis, the project proposal will give a more detailed account of the research project. A good proposal will give a thorough account of the data that is being used, including some preliminary summaries and analyses. It will also articulate the research question in terms of statistical models and will specify those models formally.
3. ~~Presentation (In class, April 8 and 13): Each student will give a brief, PechaKucha-style presentation of their final project in class, consisting of twenty slides that will automatically advance ever twenty seconds. The presentation should describe your research question succinctly, give a clear account of the statistical model(s) used, and briefly interpret the results in light of the research question.~~ Due to the shortened semester, the presentations are canceled.
4. Project rite-up (Due April 21): The writeup for the final project will take the form of a formal scholarly paper. This should go into careful detail about the project, including a full description of the data, exposition and motivation of the statistical models used, a summary of the estimation of the model parameters, and a careful, thorough interpretation of the results. It should include tables and figures to illustrate your analysis.

Each student should arrange a brief meeting with me early in the term to discuss ideas for their research project and the appropriateness for the course.

Evaluation

The evaluation components and due dates for this course are strict. If outside circumstances will make it difficult to meet a requirement *please raise the issue with me as soon as possible so we can find a solution*. Regular absences will affect your ability to do well on assignments and the final project.

Item	Due	Weight
Assignments	*due dates listed on schedule*	50% of final grade
Project precis	March 9	7.5% of final grade
Project Proposal	March 30	12.5% of final grade
Project riteup	April 21	30% of final grade

Accessibility

I strive to make the classroom as accessible as possible and to accommodate the particular needs of individual students. Students with disabilities in need of accommodation please contact the Office for Students with Disabilities

(http://www.mcgill.ca/osd/, phone 514-398-6009) to work out a plan for meeting the course requirements. Students are encouraged to contact me with any further issues they may have attending class or completing the work.

Academic integrity

McGill University values academic integrity. Therefore, all students must understand the meaning and consequences of cheating, plagiarism and other academic offenses under the Code of Student Conduct and Disciplinary Procedures (see http://www.mcgill.ca/students/srr/honest/ for more information). (approved by Senate on 29 January 2003)

L'université McGill attache une haute importance à l'honnêteté académique. Il incombe par conséquent à tous les étudiants de comprendre ce que l'on entend par tricherie, plagiat et autres infractions académiques, ainsi que les conséquences que peuvent avoir de telles actions, selon le Code de conduite de l'étudiant et des procédures disciplinaires (pour de plus amples renseignements, veuillez consulter le site http://www.mcgill.ca/students/srr/honest/).

Language of evaluation

In accord with McGill University's Charter of Students' Rights, students in this course have the right to submit in English or in French any written work that is to be graded. (approved by Senate on 21 January 2009)

Conformément à la Charte des droits de l'étudiant de l'Université McGill, chaque étudiant a le droit de soumettre en français ou en anglais tout travail écrit devant être noté (sauf dans le cas des cours dont l'un des objets est la maîtrise d'une langue).

Schedule

Background: probability and Bayesian statistics

Thu, Jan 7

Lecture: Introductions, course structure, syllabus

Lab:
Installing and testing software

Generalized linear models

Thu, Feb 4

Lecture: Logistic regression: motivation

Lab:
Intercept-only logistic regression

Required:
⋮ (McElreath 2020, Ch. 9 and Section 10.1)

Tue, Feb 9

Lecture: Logistic regression: methods and interpretation

Lab:
Prior-predictive simulation

Due:
⋮ HW 3

Thu, Feb 11

Lecture: Counts and rates

Lab:
Poisson regression in R

Required:
⋮

Data complications

Thu, Feb 25

Lecture: Missing data

Lab:
Imputing missing data with brms

Required:
⋮(McElreath 2020, Ch. 14)

Break

Tue, Mar 2

Spring break — no class

Thu, Mar 4

Spring break — no class

Data complications (continued)

Tue, Mar 9

Lecture: Non-uniform samples

Lab:
Weights and GLM in brms

Due:
⋮Final project precis

Multilevel models

Tue, Mar 16

Lecture: Random intercept models

Lab:
Random intercepts in R

Thu, Mar 18

Lecture: Estimation methods; introduction to random slopes

Required:
⋮(McElreath 2020, Ch. 13)

Tue, Mar 23

Lecture: Covariance of coefficients

Michael Betancourt. 2019. “Ordinal Regression.” May 2019. https://betanalpha.github.io/assets/case_studies/ordinal_regression.html.