ENV 338: Environmental Research Data and Decision-Making
FALL 2022

I CONTACTS

INSTRUCTOR
Name: Vianey Leos Barajas (Last names: Leos Barajas)
Email: vianey.leosbarajas@utoronto.ca
Office hours: Thursdays 1-2 pm (via zoom)

https://utoronto.zoom.us/j/81011275084
Meeting ID: 810 1127 5084
Passcode: 224849

TA
Name: Sarah Lavoie-Bernstein

II Location and Times

LECTURE
Earth Sciences, B142
10am-12pm

TUTORIAL
Astronomy & Astrophysics Building, 114
10-11am or 11am-12pm

II COURSE OVERVIEW

COURSE DESCRIPTION:
Understanding the natural world and human perturbations to it requires data. All data has inherent biases and constraints. In this class we will explore the world of environmental data from the perspective of those interested in affecting positive change. The class will use case studies and current research to explore topics such as: How do environmental scientists design studies or experiments to answer specific questions? How do we characterize the limitations of the data we have and work within these constraints to answer scientific questions and make informed and meaningful decisions?

STUDENT LEARNING OUTCOMES:
The major topics of the course will be:

- The process of experimental design from posing a research question to the collection and analysis of quantitative and qualitative data
- Considering the limits and constraints on data when answering research questions and making regulatory decisions
- Visualizing data both to explore trends and relationships as well as to communicate these relationships to readers (this will be done in Tableau)
- How data constraints, uncertainty and biases are communicated to readers

To explore these topics students will work in groups to collect their own data using sensors provided by the instructor.

MATERIALS:
Fundamentals of Data Visualization: https://clauswilke.com/dataviz/
Hand-on Data Visualization: https://handsondataviz.org
Tableau: https://mdl.library.utoronto.ca/technology/tutorials/installing-tableau-desktop

Other materials will be provided throughout the term.

III HOW THE COURSE IS ORGANIZED

This is an **in-person** course, with weekly meetings. However, lectures will be recorded and posted afterward on Quercus. The course consists primarily of lectures and tutorials, a group research project, homeworks and guest lectures.

PROPOSED COURSE SCHEDULE & RELEVANT SESSIONAL DATES*

DATES	WEEK	TOPICS	NOTES
Sept. 13	1	Introductions, working with Tableau	
Sept. 20	2	Data types and fundamentals of data visualization	
Sept. 27	3	Fundamentals of data visualization (cont.)	**Hwk 1 Due**
Oct. 4	4	Introduction to scientific inquiry	
Oct. 11	5	Environmental case studies and discussion	**Hwk 2 Due**
Oct. 18	6	Case studies and forming groups, specifying research question	
Oct. 25	7	Introduction to statistical methods and uncertainty	**Hwk 3 Due**

Nov. 1	8	Continuation of statistical models and uncertainty	
Nov. 8		*Fall Reading Week – no classes*	
Nov. 15	9	Decision making under uncertainty	**Hwk 4 Due**
Nov. 22	10	Biases and sampling issues – making decisions taking into account societal impact	
Nov. 29	11	From start to finish, the makings of a complete environmental data analysis	**Hwk 5 Due**
Dec. 6	12	Wrap-up and presentations	**Research Presentations**

*Modifications may apply as the term progresses; students will be notified in advance should any changes be made.

IV EVALUATION/GRADING SCHEME

HOMEWORKS, worth 15% each
GROUP RESEARCH PROJECT (GROUP), worth 25%

Note on grading of group work: an additional discretionary component **may** be applied to a student's grade for group work (up to ± 5 points). Students who fail to fulfill their commitments with fellow group members will have points deducted; group members whose contributions to the project are outstanding will have points added accordingly. This discretionary component will be determined at the end of the term through a peer and self assessment process (details will be explained in class); **these are not simply bonus points and will be applied at my discretion.** Please note that severe lack of participation in group work may lead to an individual zero grade on the group project.

GROUP RESEARCH PROJECT (total 25%)
Students are expected to conduct an independent group-based research project throughout the term. Inspired by the 'learning-by-doing' philosophy adopted for this course, this project as a whole aims to provide students with direct experience working collaboratively with their peers in the design, implementation, and communication of results of a project on a relevant environmental issue.

Group Research Projects account for an important portion of your grade for this term. As such, it is expected that a considerable amount of work and time will be devoted to your group projects throughout the term. Each member is expected to engage fully in group work and commit with fellow group members to do their respective share of the work. Although projects receive a group grade, students who

fail to fulfill their obligations to their peers will be penalized (see note on grading group work above). Please note that some activities related to your group projects will be carried out in class. As such, your attendance and participation in such activities will be considered into your grade (see note on grading of group work on page 4 above). Still, much of the work will be done independently outside of class time. Detailed guidelines on each part of the Group Research Project will be provided in class and on Quercus.

CRITERIA FOR EVALUATING WORK

The primary criteria used in evaluating written work are the following:

1) **Mechanics**: Your work must be completely free of grammatical, spelling or major factual errors. Students are expected to include thorough, accurate and consistent references in APA academic referencing style that includes page numbering.
2) **Writing style**: Papers must be written in a clear and unambiguous style which assists, rather than impedes, communication with the reader.
3) **Structure**: Your written work should have a clear focus and organization. The logic of the structure is determined by the purpose, which is to test a hypothesis, answer a research question or defend a thesis statement.
4) **Precision and accuracy**: Precision means saying exactly and specifically what you mean, avoiding ambiguity and vague generalities. Accuracy refers to absence of major factual errors.
5) **Analysis**: Your analysis should display understanding of the topic and, based on that understanding, originality of thought. The proposal and term paper will be evaluated on the defensibility of their analysis in terms of their use of evidence and logical coherence.

The primary criteria used in evaluating presentations are the following:

1) **Success in communicating** key concepts succinctly and accurately, thereby demonstrating sound understanding of the work being presented, both in the poster and orally.
2) **Mechanics of communication**, such as manner of speaking (including good diction and tone), structure of the presentation and level of organization OF the poster and level of organization, neatness, effective use of color and visuals and proper referencing.
3) **Ability to respond** appropriately and fairly to questions and contribute to and stimulate unstructured discussion among peers.

V COURSE POLICIES

COMMUNICATION WITH INSTRUCTOR

I have designated a block of time for "virtual" student hours or drop-in sessions during which I am available to discuss with you course-related matters (for the hours, see the first page of the syllabus). It is time set aside for you-- take advantage

of it! Appointments may also be set for students who cannot attend scheduled student hours/drop-in sessions. For urgent matters or simple questions, you may also contact me via email, but the rule of thumb is that email should not be a substitute for these "live" sessions. Depending on the situation/issue, I may ask that we set up a virtual meeting.

Please note that I am not online 24/7 and thus may not be able to respond to your messages right away. I will make an effort to respond to you within 2 days during weekdays, but it will take longer during weekends as I remain offline to spend time with my family. Please make sure to use your UofT email account (i.e. @mail.utoronto.ca) and to include the course code "ENV338" and your name in the title box of your email for easier handling. Other e-mail addresses may be filtered as spam and thus I may be unable to respond to them.

LECTURES AND CLASSROOM POLICIES

- **A Positive Learning Environment:** "*The University of Toronto is committed to equity, human rights and respect for diversity. All members of the learning environment in this course should strive to create an atmosphere of mutual respect where all members of our community can express themselves, engage with each other, and respect one another's differences. U of T does not condone discrimination or harassment against any persons or communities*." This applies to all matters and interactions related to the course including participation in class, group work, field exercises, student presentations, communications with the teaching team regarding course content or evaluation, etc.

- **Etiquette regarding the use of computers and other electronic devices**: The use of computers and other electronic devices has become central to learning since the pandemic, still the use of electronics in class should be limited to activities related to the course. Other uses are disruptive for the instructor and peers and thus are unacceptable.

- **Course notes**: As a courtesy, I will be posting my powerpoint slides on Quercus **before** class. Please note that I am under no obligation to do so and that such notes are intended to assist you and not replace your personal notes. The instructor reserves the right to stop posting the slides at any time at their discretion.

WRITTEN ASSIGNMENTS

- **Submission guidelines:** Written assignments must be submitted electronically via Quercus by **11:59 pm** on the due date. It is recommended that you keep early drafts until you receive a graded copy of your assignment.

- **Late policy:** An automatic 1 week extension will be granted to any student on any piece of assessment as long as the student registers using the online form

before the assignment is due: https://forms.gle/YYH4dDts96yXfu4V7. You are eligible for one automatic extension per assignment. Further extensions will only be granted in exceptional circumstances and should be organized with the unit coordinator. Assignments not turned in after the extension will receive a zero. Note that there will not be any extensions given for the group project.

- **Regrade Requests:** Students concerned about the assessment in assignments are invited to carefully read the feedback provided by the TA and/or instructor in written form and in the assignment rubric (where applicable). If you require clarification or feel that you have been unfairly assessed, please contact the TA or the instructor explaining the rationale for your request **within one week** of receiving the graded assignment. Please be aware that rereading the assignment does **not** necessarily translate into a higher grade. It is a reassessment and as such, the grade may remain, go up, or drop. Requests made after after one week may no longer be considered.

OTHER POLICIES

- **Declared absences:** In response to the effects of the pandemic, students are now required to submit an Absence Declaration Tool via ACORN to record any absence from academic work, whether for medical or non-medical reasons. You should complete the Absence Declaration anytime you are absent from academic work, not just when you have missed a specific course deadline. You should record each day of your absence as soon as it begins, up until the day before you return to classes or other academic activities. The University uses this information to consider students for academic accommodation and to monitor overall absences.

- **Quercus**: A *Quercus* site has been set for this course. PowerPoint slides, additional readings, assignments and other useful materials will be posted on it. *Quercus* will also be used by the instructor to communicate with the class as a whole and will serve as the platform for assignment submission. Please make sure to check it regularly. To access the ENV338 *Quercus*, go to the UofT login page at: https://q.utoronto.ca/ and login using your UTORid and password. Once you have logged in, click on the Dashboard module on the right margin of your screen. You will then be able to see the tab for ENV338 course (along with all your other *Quercus*-based courses).

VI INSTITUTIONAL POLICIES AND SUPPORT

ACADEMIC INTEGRITY

Academic integrity is essential to the pursuit of learning and scholarship in a university, and to ensuring that a degree from the University of Toronto is a strong signal of each student's individual academic achievement. As a result, the University

treats cases of cheating and plagiarism very seriously. The University of Toronto's Code of Behaviour on Academic Matters (https://governingcouncil.utoronto.ca/secretariat/policies/code-behaviour-academic-matters-july-1-2019) outlines the behaviours that constitute academic dishonesty and the processes for addressing academic offences. Potential offences include, but are not limited to:

In papers and assignments:

1. Using someone else's ideas or words without appropriate acknowledgement.
2. Submitting your own work in more than one course without the permission of the instructor.
3. Making up sources or facts.
4. Obtaining or providing unauthorized assistance on any assignment.

On tests and exams:

1. Using or possessing unauthorized aids.
2. Looking at someone else's answers during an exam or test.
3. Misrepresenting your identity.

In academic work:

1. Falsifying institutional documents or grades.
2. Falsifying or altering any documentation required by the University.

All suspected cases of academic dishonesty will be investigated following procedures outlined in the Code of Behaviour on Academic Matters. If you have questions or concerns about what constitutes appropriate academic behaviour or appropriate research and citation methods, you are expected to seek out additional information on academic integrity from your instructor or from other institutional resources (see https://www.academicintegrity.utoronto.ca/).

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Lectures and course materials are considered intellectual property of the Instructor and are covered by the Canadian Copyright Act. These materials are made available to students for personal study purposes only (i.e., they cannot be shared outside or 'published" in any way without prior written consent of the instructor). Lectures cannot be recorded without the instructor's written permission. Please be advised that posting course materials, or recordings to external websites (or in any other format) without explicit permission of the instructor, constitutes an infringement on the Canadian Copyright Act and is absolutely prohibited. More information regarding this is available here: https://teaching.utoronto.ca/ed-tech/audio-video/copyright-considerations/

ACCESSIBILITY NEEDS

Students with diverse learning styles and needs are welcome in this course. The University of Toronto is committed to accessibility: if you require accommodations for a disability, or have any other accessibility concerns about the course, please

contact Accessibility Services as soon as possible. You may also want to contact the Accessibility Services Office if you have problems arising from chronic issues or injuries sustained during the term that affect your ability to do tests or course work.

ADDITIONAL SERVICES and SUPPORT
The following are some important links to help you with academic and/or technical service and support

- General student services and resources at Student Life
- Services for your physical and mental health, and wellness programs can be found at: Health and Wellbeing
- Emergency support if you're feeling distressed
- Full library service through University of Toronto Libraries.
- Resources on conducting online research through University Libraries Resarch
- Resources on academic support from the Academic Success Centre
- Learner support at the Writing Centre
- Information for Technical Support/Quercus Support
- Services to assist students with English Learning are offered through English Language Learning (ELL)
- Stay on top of your work while connecting with your peers by creating a Recognized Study Group (RSG) or my joining a Meet to Complete online drop-in study session