University of Toronto
School of the Environment
ENV 223H1: Environmental Research Skills
Fall 2019

Time: Thursdays 2:00-4:00 PM, Room: ES B142
Instructor: Brad Bass, Email: brad.bass@utoronto.ca
Office hours: [tentatively] Thursdays, 12:30-1:30 PM, 4:00 – 5:30 PM or by appointment
Teaching Assistant: Nicole Capicotto, Email: nicole.capicotto@mail.utoronto.ca

Course description
Environmental studies is an interdisciplinary field that looks at the interactions between humans and the environment. The nature of these interactions is inherently complex, and demands that environmental scholars and practitioners (such as you) have a sound and integrative understanding of natural sciences, social sciences, and the humanities with the capacity to navigate discussions in all of these areas. At the same time, massive amounts of information explaining how humans impact the environment are readily available and increasing at an alarming rate. Not only is this information available through scientific publications, but also through mainstream and social media outlets, websites and publications from special interest groups. Your future career may involve making or advising decisions or proposing changes to environmental policy and practice. In order for modern environmental professionals to be effective, they must know how to generate, evaluate, and communicate reliable and relevant information, either individually, as part of team or as a team leader.

This course is designed as a practical introduction to environmental studies research. More specifically, it aims to familiarize students with the methods and techniques used in environmental studies, allow them to develop a basic set of skills to write proposals to conduct research on topics of interest in this interdisciplinary field, to conduct research, work with other professionals from a myriad of disciplines with a myriad of tools, and communicate results to suitable audiences. The course is inspired by a philosophy of “learning by doing” and a professional approach. It emphasizes qualitative and quantitative methods and exposes students to the basics of “fieldwork”. The main topics discussed include: topic selection and the formulation of a research question, using the literature including articles outside of your expertise, data sources and information extraction, making sense of qualitative and quantitative data, qualitative and quantitative modelling, fieldwork, design thinking and communication skills for different audiences. The course consists primarily of lectures, a group research project, enhanced by active-learning activities and a field assignment.

Learning objectives
This course will allow students to develop basic skills that will enable them to locate and critically assess existing environmental research, as well as to design, conduct and report on a basic research project on a current environmental issue. More concretely, by the end of the course students should be able to:

• Understand how to develop a testable research question that can guide environmental research.
• Design an environmental research project.
• Identify available information and a suitable means for answering your question
• Synthesizing the available research literature
• Identify and evaluate different primary data gathering techniques and information extraction.
• Working with models and modellers.
• Conduct basic fieldwork.
• To communicate research results effectively through different forms (orally, written and visually).
• Develop the ability to work collaboratively and effectively in groups.
• Develop strong writing skills.

## Evaluation

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Assignment type</th>
<th>Due date*</th>
<th>Worth</th>
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<tbody>
<tr>
<td>Attendance, in-class activities &amp; participation in class including</td>
<td>Individual</td>
<td>Throughout term</td>
<td>20 %</td>
</tr>
<tr>
<td>• Cognitive Mapping of Ecological Footprint</td>
<td>Group</td>
<td></td>
<td>10%</td>
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<tr>
<td>Two page write up on Ecological Footprint</td>
<td>Individual</td>
<td>Sept 27</td>
<td>10%</td>
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<tr>
<td>Ecological Footprint Fieldwork report</td>
<td>Individual</td>
<td>Oct 10</td>
<td>20%</td>
</tr>
<tr>
<td>Analysis of two articles &amp; Ecosystem Simulation Model (4 page limit)</td>
<td>Group</td>
<td>Oct 24</td>
<td>20%</td>
</tr>
<tr>
<td>Group Research Proposals (6 pages)</td>
<td>Group</td>
<td>Dec 5</td>
<td>10%</td>
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<tr>
<td>1. Literature Review (3 pages)</td>
<td></td>
<td>Dec 5</td>
<td>10%</td>
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<tr>
<td>2. Proposal including methods (3 pages)</td>
<td></td>
<td>Nov 22 or Nov 29</td>
<td>10%</td>
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<td>3. Presentation</td>
<td></td>
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<tr>
<td>Total</td>
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<td>100%</td>
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*Note: deadlines for assignment submissions do not necessarily coincide with lecture dates.

**Note on cognitive mapping:** Your grade for the cognitive mapping is part of your participation grade. You must bring your worksheets for the footprint to the cognitive mapping classes, as this exercise will be based on your footprints. Your work will not be formally graded, but incomplete work or being absent will result in a zero. Not participating in your group project will lower this participation mark. This exercise may allow some of you to participate in a larger-scale research project involving the development of multiple cognitive maps in a local application (participation in this larger effort will be voluntary).

**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 and, as such, likely a failing grade for the course. The modeling lab will be available to you on Mondays from 5:00 – 6:30/7:00 and Thursdays after the class. You are encouraged to take advantage of some of these times to deepen your understanding of modeling and of the software.
**Readings**

*Required text:*

*Recommended resource:*
Northey, M., Draper, D. and Knight, D.B. (2015). *Making sense: a student’s guide to research and writing: geography & environmental sciences* (6th ed.). Don Mills: Oxford University Press. This book contains information about taking notes, working in groups, writing in general, reporting on results, etc, and as such, it is a very handy resource for many of the activities you will be undertaking for this course.

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<thead>
<tr>
<th>Week</th>
<th>Topic</th>
<th>Notes</th>
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<tr>
<td>3 (Sept. 19):</td>
<td>How do we use the existing literature to develop research questions and as a source of data? How do we read difficult literature?</td>
<td>Group list, contract and general topic due.</td>
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<td>4 (Sept. 26):</td>
<td>Qualitative and Quantitative Types of Data. What is qualitative data? Does data have to be numerical? Qualitative analysis involve mathematics?</td>
<td>Reading: Qualitative Methods Chapter in text. One page write up on Ecological Footprint.</td>
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<td>6 (Oct. 10):</td>
<td>Introduction to Qualitative Agent-Based Simulation Modelling Gerstein Library Sessions. Modelling as a creative endeavor. Why modeling can be addictive.</td>
<td>Gerstein Library, second-floor instructional lab. Start-up guides will be provided.</td>
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<tr>
<td>7 (Oct. 17):</td>
<td>Tapping into expert knowledge of complex systems. Qualitative modeling with Cognitive maps.</td>
<td>Fieldwork write-up due.</td>
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<tr>
<td>8 (Oct. 24):</td>
<td>Cognitive maps continued</td>
<td>Write-up of modeling Due.</td>
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<tr>
<td>(Nov. 7)</td>
<td><strong>Fall Reading Week—no classes</strong></td>
<td></td>
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<tr>
<td>11 (Nov. 22):</td>
<td>Group Presentations</td>
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Both books are available for purchase at the UofT Bookstore; copies of the 4th and earlier editions of *Social Research Methods* ([http://go.utlib.ca/cat/10258595](http://go.utlib.ca/cat/10258595)) and of the 6th and earlier editions of *Making Sense* are also available through the UofT Library system ([http://go.utlib.ca/cat/8276083](http://go.utlib.ca/cat/8276083)). Another way to reduce your costs, is to use an earlier edition of the books, however, it will be your personal responsibility to figure out page and content compatibility. Additional readings from academic sources will be assigned; such readings will be made available through the course’s Quercus as a way to reduce paper use and to minimize your costs. Alternative arrangements will be made for readings that are not available in e-format.

**Proposed lecture schedule***

- NOTE: Modifications may apply as the term progresses; students will be notified in advance, should any changes be made.

**Fieldwork assignment**

The course includes an independent fieldwork exercise within farmers markets in Toronto/Milton, **outside of class time**. The assignment is intended to complement materials examined in class by providing students with basic hands-on experience with primary data collection. Please note that participation is **mandatory and counts towards your final grade**. Further details will be discussed in class.

**COURSE POLICIES AND STUDENT RESPONSABILITIES**

**Lectures and classroom policies**

- **Punctuality:** Class will start on time (i.e., 2:10 PM). If you have to come into class late, please do so in the least disruptive manner possible. **As a sign of respect to the instructor and the rest of the class, arrivals after 2:30 PM are discouraged.**

- **Attendance:** Students are expected to come to class regularly. The instructor will randomly select dates for which attendance will be formally counted. Please note that attendance during sessions devoted to cognitive mapping, simulation modeling and student presentations is particularly important and will count towards your grade.

- **Class preparation and student participation:** Physical presence in the classroom is not sufficient. Students are expected to engage in the course, do the assigned readings in advance and be prepared to participate in class and in-class activities. I want this class to foster an environment that encourages student participation and questions. Student participation in class and in-class activities counts towards your evaluation.

- **Course manners:** Students are expected to handle themselves with respect toward the instructor, teaching assistant, and your peers in all matters related to the course, including participation in class, group work, field exercises, student presentations, communications regarding course content or evaluation, etc.

- **Etiquette regarding the use of computers and other electronic devices:** The use of computers and other electronic devices in class should be limited to activities related to the course. Phones
ringing, earphones, web surfing, watching unrelated videos and texting are disruptive to your peers and the instructor. As such, they are unacceptable.

- **Copyright issues:** Lectures and course materials are considered intellectual property and are covered by the Canadian Copyright Act. Students will be allowed to record (audio or video) a lecture only with my permission. If granted, such permission is only for such student’s own study purposes or to share with other students in the class. You cannot distribute nor “publish” them online or in any other way without explicit permission. Please refer to the “Rules and Regulations” section of the printed version of the Faculty of Arts and Sciences Calendar for further details on UofT Copyright issues.

**Written assignments**

- **Formatting:** Coursework must be word processed double-spaced, 12 point font size, unless otherwise noted. Assignments must be proofread prior to submission to insure that they are free of grammatical and spelling errors, and must include a list of all references cited in the text, using the APA citation style (see “UofT Libraries Research Services” link in the resources section below). All coursework must also include the student’s name and the last 5 digits of your ID number, the course’s code and name and that of the instructor in order to avoid loss or improper identification. Note, however, that there is no need to use cover page to do so.

- **Green course:** This course has been recognized as a green course by the Sustainability Office. Green courses are intended to reduce paper use. As such, assignments must be submitted electronically (see submission guidelines below). Students are also encouraged to conserve paper by limiting their printing of course materials whenever possible, or printing double-sided. To learn how to print double-sided see: [http://utbeat.biology.utoronto.ca/doublesiding.html](http://utbeat.biology.utoronto.ca/doublesiding.html), or [http://www.printdoublesided.sa.utoronto.ca/Instructions%20-%201st%20page.htm](http://www.printdoublesided.sa.utoronto.ca/Instructions%20-%201st%20page.htm).

**Submission guidelines:**

- **Submission guidelines:** All assignments must be submitted electronically through Quercus by 11:59 PM on the date specified by the instructor, unless otherwise noted. It is recommended that you keep copies of your assignments and early drafts until you receive your graded assignment.

- **Late submissions:** Work submitted late will be accepted with a 5% daily penalty (including weekend days), up to seven days after the due date. If needed, you may submit your assignment during the weekend as a way to minimize late penalties. In such cases, the date/time of submission will be considered, using 11:59 PM as time of reference. In case of an outstanding valid situation you must contact me, preferably in advance. I cannot consider a particular situation unless I know about it, so do not wait until the end of the term to communicate with me if something did come up. For health reasons, a completed University of Toronto Verification of Student Illness or Injury form must be submitted ([http://www.illnessverification.utoronto.ca/](http://www.illnessverification.utoronto.ca/)); other proof may be required by the instructor for nonmedical reasons (see general guidelines and form put together by FAS available at: [http://www.artsci.utoronto.ca/current/petitions/process#documentation](http://www.artsci.utoronto.ca/current/petitions/process#documentation)). The required form must be submitted within a week of the missed deadline. No extensions will be granted unless you have communicated with the instructor and your reasons have been deemed valid.

**Group projects**

Group research projects account for an important portion of your grade for this term (i.e., 50%). 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 to commit with fellow group members to do her/his 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 in page 3 above). Still much of the work will be done outside of class time. Further details will be discussed in class.

Communication with the instructor
My preference is to meet with you in person. I am not on campus full time. I will grant some unusual access if necessary, but I ask you to be flexible if you do need to speak with me. I have a lot of interest in new communication technologies, and I am willing to learn from you in this respect. I will make myself available for you on Monday evenings and after class, in the modeling lab at the Gerstein Library. For work on modeling, you will have access to the lab and to assistance at 5:00 PM, but might not have access for other issues until 6:30 PM. Appointments may also be set for students who cannot come during scheduled office hours. 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 office hours. I will make an effort to respond to you within 48 hours. You will find that I am very committed to your success and your ability to work through the course assignments.

Email
Please make sure to use your University of Toronto email account (i.e., @mail.utoronto.ca) and to include the course code “ENV223” 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.

Quercus
A Quercus site has been set for this course. I will use the site to post, additional readings, assignments and other useful materials. Quercus will also be used by the instructor to communicate with the class. Please make sure to check it regularly. To access the ENV223 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 ENV223 course (along with all your other Quercus-based courses).

Accessibility Needs
Accessibility Needs: The University of Toronto is committed to accessibility. If you require accommodations for a disability, or have any accessibility concerns about the course, the classroom or course materials, please contact Accessibility Services as soon as possible: disability.services@utoronto.ca or http://studentlife.utoronto.ca/as You may also want to contact 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.

Academic integrity
Academic integrity is fundamental to learning and scholarship at the University of Toronto. Participating honestly, respectfully, responsibly, and fairly in this academic community ensures that the U of T degree that you earn will be valued as a true indication of your individual academic achievement, and will continue to receive the respect and recognition it deserves. Familiarize yourself with the University of Toronto’s Code of Behaviour on Academic Matters [http://www.governingcouncil.utoronto.ca/policies/behaveac.htm It is the rule book for academic behaviour at the U of T, and you are expected to know the rules. Potential offences include, but are not limited to:

In papers and assignments:

- Using someone else’s ideas or words without appropriate acknowledgement
- Copying material word-for-word from a source (including lecture and study group notes) and not placing the words within quotation marks
- Submitting your own work in more than one course without the permission of the instructor
• Making up sources or facts
• Including references to sources that you did not use
• Obtaining or providing unauthorized assistance on any assignment including:
  o working in groups on assignments that are supposed to be individual work
  o having someone rewrite or add material to your work while “editing”
• Lending your work to a classmate who submits it as his/her own

Misrepresentation:
• Falsifying or altering any documentation required by the University, including doctor’s notes
• Falsifying institutional documents or grades

Please note that potential offences will be addressed in accordance with institutional procedures.

Useful UofT Resources
UofT Libraries
• Library Catalogue (search for books, journal articles, documents, databases): http://search1.library.utoronto.ca/UTL/search.jsp
• Research services for students (e.g., research guides, citation resources, refworks, etc.): https://onesearch.library.utoronto.ca/research

UofT Writing (for advice on: planning and organizing, reading and researching, using sources, types of writing, style and editing and English as a second language):
http://advice.writing.utoronto.ca/; http://writing.utoronto.ca/support/english-language-support/

Evaluation criteria for written work
The primary criteria used in evaluating written work are the following:
1. Mechanics: Your work must be completely free of grammatical and spelling errors. Students are expected to include thorough, accurate and consistent references in an established academic referencing style that includes page numbering.
2. Writing style: Your papers should be written in a clear, concise and unambiguous style, which assists, rather than impedes, communication with the reader.
3. Structure: Defined as coherence of the organization of the paper. 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 vague generalities. Accuracy refers to absence of major factual errors.
5. Analysis: Student essays are expected to include critical distance, reflection and originality of thought.

Evaluation criteria for presentations
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 poster and level of organization, neatness, effective use of color and visuals and proper referencing.
3. Ability to respond appropriately and fairly to questions.