

Environmental Methods and Analysis  
ENSC 2002 – Fall 2021

**SYLLABUS**

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**Class Schedule:** Tuesdays and Thursdays , 8:35am-9:55am, Room 101, Azrieli Theatre  
Lecture recordings (slides with audio recorded live in class) posted within 24hr of each lecture for students who cannot attend in person

**Virtual Office Hours:** by appointment (in-person or over Zoom)

**Text:** None. Readings will be assigned, mostly from the primary scientific literature and other relevant sources. Online discussion questions will be posted the evening before each lecture.

**Communication:** Messages regarding the course, as well as slides and video from lectures, will be posted on BrightSpace. If you have questions, email is the best way of getting a hold of us. Try to direct your questions to the lecturer who taught the lecture or topic your question concerns. We will endeavour to answer emails within 48 hours, but given the volume of emails we receive, please DO NOT count on this. If we email you a quick one-line reply, please don't take it personally – we are just trying to make sure we are answering emails as efficiently as possible.

**YOU MUST EMAIL US USING YOUR OFFICIAL STUDENT EMAIL ADDRESS (I.E., YOUR CMAIL ADDRESS). YOU MUST ALSO HAND IN YOUR ASSIGNMENTS BY UPLOADING TO BRIGHTSPACE.**

**Course Description and Objectives:**

This course focuses on the design, analysis and interpretation of environmental science research. Environmental science involves unique challenges owing to the complexity of the systems we study, and the lack of ability to conduct controlled, replicated laboratory studies. Students will learn to apply the scientific method to such unique and challenging conditions. Topics include: study and application of qualitative and quantitative techniques in environmental science, experimental design, data collection and assembly, data manipulation, data analysis, and interpreting and conveying scientific information.

At the end of the semester, students are expected to be able to:

1. Read, interpret, and summarize the key findings of scientific research.
2. Discuss and debate the quality of scientific evidence and interpretation thereof, as presented in scientific articles.
3. Design scientific studies relevant to environmental science and management.
4. Summarize and synthesize the best available science on environmental topics.

**General course policies:**

- 1) By hearing and appreciating different viewpoints or opinions (even if you personally disagree with them), you can often make your own arguments more convincing and successful. However, please remember to always treat others with respect—personal attacks and pejorative or discriminatory language will not be tolerated.
- 2) This course is participation-oriented, and 20% of the grade is for participation. As such, active participation is a prerequisite for success. Professionalism is expected of you in all aspects of this course, and promptness is expected for each class.
- 3) For students who are able to attend in-person lectures, be prepared for an in-class discussion during each lecture related to the assigned readings and discussion question. During discussions, we ask you to be mindful of your natural level of participation. If you're someone who has a tendency to dominate discussion, we ask that you're intentional about giving space for others to participate. If you have a tendency not to speak up, we ask that you try to be more intentional in sharing your thoughts. Nervousness during discussion will not be a reason for lost participation marks. Practice makes perfect - the more you push yourself to participate in discussions, the easier it will get!
- 4) If you are not able to attend a lecture in-person, we expect you to contribute to an online discussion board post related to the assigned readings and/or discussion question (which will be available before each lecture) sometime

during the week following the lecture. The same guidelines about respectful discussion apply to these posts.

**Late Policy:** The late policy for this course was changed in response to COVID, and we have decided to keep this change. There is NO penalty for late assignments for Assignments 1 and 2. *However, if an assignment is handed in late, we cannot guarantee that it will be marked quickly, or even before the final assignment is due. This means that you may not get feedback that could be useful in your final assignment.* **Assignments handed in after the final assignment due date will be given a zero.**

**Plagiarism and Academic Integrity:** You will be held to high standards of academic integrity (this is particularly important when reviewing and synthesizing other people's ideas). Academic misconduct related to plagiarism and academic integrity has serious consequences (see <https://carleton.ca/secretariat/wp-content/uploads/Academic-Integrity-Policy.pdf>).

#### **Grading:**

Assignment 1 – Strong Inference ( <b>Due Sept 30</b> )	10%
Assignment 2 - Precautionary principle ( <b>Due Oct 21</b> )	10%
Assignment 3 - Data analysis in R ( <b>Due Nov 16</b> )	10%
Participation in class discussions etc.	20%
Final combined assignment (see Notes B and C below, <b>Due Dec 9</b> )	50% without leaf data participation, 45% with leaf data participation (see Note E)

#### **Notes:**

- A) For participation in class discussions, we will be asking you questions on the reading assignments and class discussion topics. So you must have read assigned papers beforehand. Gathering and submitting leaf data (to be explained in class) will also count toward participation grades. Students can choose to participate in discussions online by posting to the course discussion board. Discussion board posts can either respond to the points raised in class on the lecture recording, or can raise new points. While discussion board posts must be posted within a week for participation credit, feel free to continue discussing these topics beyond the week deadline.

- B) For the final combined assignment, you will be summarizing a scientific article using different formats (including a presentation). You can choose any article related to ecology, conservation science, or environmental science, as long as it is 1) original research, and not a review/perspective; and 2) actually science (science with a social component is fine, but the study must be scientific research). 3) peer reviewed (not a preprint or blog post)
- C) The final combined assignment includes i) a tweet (worth 1% of the total grade); ii) a policy brief OR mock newspaper article (200 words max; worth 10% of final grade); iii) a scientific critique of the article, drawing on the broader literature (500 words max excluding references; worth 24% of final grade); iv) a 7 minute presentation summarizing the paper and its context (15% final grade). Parts i)-iii) must be submitted in a single document. More detailed instructions will be provided in class.
- D) There will be no exam. (How often do you have to write an exam in the real world? Almost never. While presentations are also nerve wracking, they are much more valuable in the long run and worth practicing.)
- E) Leaf data participation (Due **Nov 2**): If you choose to participate in Leaf data collection (more on this in class), 5% of your final combined assignment grade will be moved to leaf data, which will be graded complete/incomplete. Your critique from the final assignment will be down-weighted to 22% and your presentation will be down-weighted to 12%.

### Tips for Success:

- 1) Do the readings. We WILL ask you questions on the readings (We are going to ask questions of everyone in the class). If you've done the readings you'll look smart and get easy marks
- 2) Make sure you participate. This includes showing up for class, asking questions, and/or participating in the online discussion. Details will be on Brightspace and discussed in lecture
- 3) Do not leave assignments to the last minute, and hand them in on time. This means you will get timely and important feedback. The current number of assignments is half of what it was in previous versions of this course. That is because we are looking for quality and not quantity, and we are trying to make sure workload is manageable. We have also specified clear word limits. This is also more reflective of real-world scenarios, where wording around science interpretation and communication must be precise.
- 4) For your presentations, practice with friends beforehand. This can help to work out timing, awkward bits, and calm nerves. We have assigned presentations, because once you graduate we can almost guarantee you will be called upon to give

numerous presentations to your peers or the public. Some of these presentations may change the course of your career. By practicing presentation skills while you're in university, you will be better presenters when it really counts! **Plus, we will not mark you down for nervousness.**

### **Course adjustments since COVID**

While things are reopening across the country, we understand that life is still remarkably different for students since COVID, and that this semester will be unlike any before. Workload, time management and interactions are likely to remain more challenging – for students, TAs and profs. To make things easier for you, we have taken the following steps:

- 1) We have made sure content focuses on the essentials
- 2) We have added more discussion topics
- 3) We have made due dates optional (but note that you need to get your assignments in on time if you want timely feedback).
- 4) We are using an instruction model with lots of discussion, which we will explain in the first class.
- 5) We are using a blended approach, allowing both online and in-person participation. This includes the ability to do in-class assignments outside of class time by using the discussion board. The discussion board can also be a great place to troubleshoot assignments and difficult concepts with your fellow classmates.

### **Personal considerations**

We want you to be able to engage meaningfully with this course. Please let us know if there is anything we can do to help make this possible. This can include making us aware of your preferred pronouns, and letting us know about any accessibility barriers to either the online or in-person course content. We take our students' mental health as seriously as their physical health. If at any point you feel you need additional support, Carleton's Counselling Services is here to help: [carleton.ca/health/counselling-services/](https://carleton.ca/health/counselling-services/).

### **Specific Accommodation Requests**

You may need special arrangements to meet your academic obligations during the term. Here are some specific cases with a defined process:

#### **Pregnancy obligation**

Please contact your instructor with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details, visit the Equity Services website:

[carleton.ca/equity/wp-content/uploads/Student-Guide-to-Academic-Accommodation.pdf](https://carleton.ca/equity/wp-content/uploads/Student-Guide-to-Academic-Accommodation.pdf)

#### **Religious obligation**

Please contact your instructor with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details, visit the Equity Services website:

[carleton.ca/equity/wp-content/uploads/Student-Guide-to-Academic-Accommodation.pdf](https://carleton.ca/equity/wp-content/uploads/Student-Guide-to-Academic-Accommodation.pdf)

### **Academic Accommodations for Students with Disabilities**

The Paul Menton Centre for Students with Disabilities (PMC) provides services to students with Learning Disabilities (LD), psychiatric/mental health disabilities, Attention Deficit Hyperactivity Disorder (ADHD), Autism Spectrum Disorders (ASD), chronic medical conditions, and impairments in mobility, hearing, and vision. If you have a disability requiring academic accommodations in this course, please contact PMC at 613-520-6608 or [pmc@carleton.ca](mailto:pmc@carleton.ca) for a formal evaluation. If you are already registered with the PMC, contact your PMC coordinator to send us your **Letter of Accommodation** at the beginning of the term. **Requests made within two weeks will be reviewed on a case-by-case basis.** After requesting accommodation from PMC, please follow up with us to ensure accommodation arrangements are made.

[carleton.ca/pmc](https://carleton.ca/pmc)

### **Survivors of Sexual Violence**

As a community, Carleton University is committed to maintaining a positive learning, working and living environment where sexual violence will not be tolerated, and is survivors are supported through academic accommodations as per Carleton's Sexual Violence Policy. For more information about the services available at the university and to obtain information about sexual violence and/or support, visit:

[carleton.ca/sexual-violence-support](https://carleton.ca/sexual-violence-support)

### **Accommodation for Student Activities**

Carleton University recognizes the substantial benefits, both to the individual student and for the university, that result from a student participating in activities beyond the classroom experience. Reasonable accommodation must be provided to students who compete or perform at the national or international level. Please contact your instructor with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist.

<https://carleton.ca/senate/wp-content/uploads/Accommodation-for-Student-Activities-1.pdf>

For more information on academic accommodation, please contact the departmental administrator or visit: [students.carleton.ca/course-outline](https://students.carleton.ca/course-outline)

### **COVID-19 Protocols**

All members of the Carleton community are required to follow COVID-19 prevention measures and all mandatory public health requirements (e.g. wearing a mask, physical distancing, hand hygiene, respiratory and cough etiquette) and [mandatory self-screening](#) prior to coming to campus daily.

If you feel ill or exhibit COVID-19 symptoms while on campus or in class, please leave campus immediately, self-isolate, and complete the mandatory [symptom reporting tool](#). For purposes of contact tracing, attendance will be taken in all classes and labs. Participants can check in using posted QR codes through the cuScreen platform where provided. Students who do not have a smartphone will be required to complete a paper process as indicated on the [COVID-19 website](#).

All members of the Carleton community are required to follow guidelines regarding safe movement and seating on campus (e.g. directional arrows, designated entrances and exits, designated seats that maintain physical distancing). In order to avoid congestion, allow all previous occupants to fully vacate a classroom before entering. No food or drinks are permitted in any classrooms or labs.

For the most recent information about Carleton's COVID-19 response and required measures, please see the [University's COVID-19 webpage](#) and review the [Frequently Asked Questions \(FAQs\)](#). Should you have additional questions after reviewing, please contact [covidinfo@carleton.ca](mailto:covidinfo@carleton.ca)

Please note that failure to comply with University policies and mandatory public health requirements, and endangering the safety of others are considered misconduct under the [Student Rights and Responsibilities Policy](#). Failure to comply with Carleton's COVID-19 procedures may lead to supplementary action involving Campus Safety and/or Student Affairs.