

ENVR 2810 A01: ENVIRONMENTAL CRITICAL THINKING AND SCIENTIFIC RESEARCH

COURSE SYLLABUS: FALL 2026



Equity, Diversity and Inclusion Statement

I am committed to creating a welcoming and inclusive learning environment for all students. I acknowledge that the University of Manitoba campuses are located on the ancestral lands of the Anishinaabeg, Ininiwak, Anishininewuk, Dakota, and Dene peoples, and the homeland of the Métis Nation. I respect the treaties that were made on these territories and am committed to working towards reconciliation. I value diversity in all its forms and strive to create a classroom where everyone feels respected and supported. I will work to dismantle systemic barriers and ensure that all students have equitable access to learning opportunities

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Course Details

Course Title & Number:	ENVR 2810 Environmental Critical Thinking and Scientific Research
Number of Credit Hours:	3 credit hours
Class Times & Days of Week:	W 2:30 – 5:30 pm
Prerequisites:	ENVR 1000 or GEOG 1280 or GEOG 1290 or GEOG 1700 or GPE 1700 or consent of department.

Instructor Contact Information

Instructor(s) Name:	Dr. John Iacozza (he/him)
Preferred Form of Address:	John or Dr. Iacozza
Office Location:	250 Wallace Building
Office Hours or Availability:	Monday and Wednesday 1:00 – 2:00 pm. If you are unable to attend during these times, I am happy to meet by appointment. Please email me to arrange a mutually convenient time. I also welcome drop-in visits whenever my office door is open and my schedule permits. Whether you have questions about course material, assignments, or other academic matters, I encourage you to stop by; I look forward to meeting with you throughout the term.
Office Phone No.	204-474-8483
Email:	John.Iacozza@umanitoba.ca (preferred method of contact). I respond to emails and phone messages between 9:00 a.m. and 4:00 p.m., Monday through Friday. Every effort will be made to respond within 48 hours, excluding weekends and statutory holidays.

Course Description

Calendar Description: Course is designed to aid students in the development of a skeptical, scientific approach to thinking about environmental and geographical problems and issues, as well as applying that skepticism and critical thinking to develop well balanced research hypotheses and data collection methods.

Extended Description: In many situations, we accept information or rely on our existing beliefs without critically examining them. This information may come from classroom instruction, the media, friends, social media, or individuals regarded as experts. This course is designed to help students develop the skills to think critically about the information they encounter by applying logical, evidence-based reasoning to evaluate claims with scientific or objective foundations.

Critical thinking is not the same as being critical. Rather, it involves asking thoughtful questions, evaluating the quality of evidence, recognizing assumptions and biases, and drawing well-supported conclusions. Throughout the course, students are encouraged to question ideas presented by the instructor, their classmates, and other sources. Productive discussion, however, depends on maintaining respect, openness, and courtesy toward those with different perspectives. The goal is not simply to persuade others, but to better understand complex issues through reasoned, evidence-based dialogue.

Course Goals and Learning Objectives

This course is designed to develop students' ability to think critically about scientific claims and environmental issues while strengthening their research, analytical, and communication skills. Students will learn how scientific knowledge is developed, evaluated, and communicated, and will apply these skills to contemporary environmental and geographical problems.

By the end of this course, students will be able to:

- explain the principles of critical thinking, skepticism, and scientific reasoning.
- identify cognitive biases, logical fallacies, and common forms of scientific misinformation.
- evaluate the quality, reliability, and limitations of scientific evidence.
- critically assess primary scientific literature.
- develop clear research questions and testable scientific hypotheses.
- interpret scientific data and draw evidence-based conclusions.
- demonstrate ethical scientific practices, including reproducibility and research integrity.
- communicate scientific findings clearly using logical, evidence-based arguments.
- apply critical thinking skills to evaluate contemporary environmental and geographical issues.

Learning Activities

During this course, students are asked to participate in several learning activities:

- Attend lectures and take the appropriate notes (notes will be available online)
- Participate in active learning activities during the lectures, as well as after the lectures (more explanation provided in the lectures)
- Reading assigned course material, as well as viewing any animations/videos provided on UMLearn
- Demonstrate your learning through a variety of assessments, including assignments, quizzes and term paper designed to assess students' understanding of various aspects of the environmental issues.

What You Can Expect From Me

As your instructor, I am committed to the following:

- I will listen actively and foster a respectful and inclusive learning environment in accordance with the **Respectful Work and Learning Environment Policy**.
- I will maintain confidentiality by discussing ideas and concepts without sharing personal stories or identifying individuals.
- I will be punctual and well prepared for all lectures and scheduled meetings.
- I will be available to discuss course material, assessments, or other course-related questions during office hours or by appointment. Please feel free to stop by my office during office hours or email me to arrange a meeting. I am always happy to discuss the course material in greater detail.
- Assessments will normally be graded within **two weeks** of submission. Grades and feedback will be posted on UMLearn. If you have questions about your grade or feedback, I encourage you to meet with me in person, as it is often the most effective way to discuss your work and answer any questions.

What I Can Expect From You

As a student in this course, you are expected to:

- Treat your classmates, your instructor, and guest speakers with respect, in accordance with the **Respectful Work and Learning Environment Policy**.
- Recognize that learning involves asking questions and that it is perfectly acceptable not to know the answer. Be willing to seek clarification when needed and support others in their learning.
- Attend lectures, take meaningful notes, and actively participate in class discussions and learning activities.
- Read the assigned course materials before class whenever possible. Doing so will enhance your understanding of the lecture material and contribute to more engaging class discussions.
- Complete all assessments independently and submit them on time, unless otherwise instructed. While discussing course concepts with classmates is encouraged, all submitted work must represent your own understanding and be written in your own words.

How to Succeed In This Course

- Attend lectures and participate actively. Engage in discussions, ask questions, and contribute respectfully to class activities. Learning is enhanced through active participation.
- Complete the assigned readings. Reading the material before class will improve your understanding of lectures and help you participate more effectively in discussions.
- Think critically and use evidence. Evaluate ideas based on credible scientific evidence, logical reasoning, and the quality of the supporting information rather than personal opinions or assumptions.
- Stay organized and manage your time. Keep up with readings, monitor deadlines on UMLearn, and begin assignments and your term paper well before they are due.
- Seek help early. If you are having difficulty with the course material or an assessment, attend office hours or contact the instructor as soon as possible.
- Maintain academic integrity. Complete all assessments independently unless instructed otherwise, and ensure that all submitted work is your own.
- Be open to new ideas. Critical thinking involves questioning assumptions, considering alternative perspectives, and being willing to revise your conclusions when presented with stronger evidence.

Readings and Materials

Required Materials: There is no required textbook for this course. Instead, readings for each unit will be posted on UMLearn. All required readings are available through the University of Manitoba Libraries (<https://umanitoba.ca/libraries/>). If you experience any difficulty accessing the readings, please contact me and I will be happy to assist you.

Technology: Technology is an important component of this course and should be used responsibly and in accordance with University of Manitoba policies. All technology resources are expected to be used in a responsible, ethical, legal, and educational manner. The use of electronic devices during class is limited to course-related activities or accommodations approved through University of Manitoba Student Accessibility Services.

Students will be required to participate in in-class activities using Mentimeter (www.menti.com). Menti can be accessed using a laptop, tablet, or smartphone. Course materials, including lecture notes, readings, announcements, assignments, and grades, will be available through UMLearn, the University of Manitoba's learning management system. If you have any questions about accessing Menti or UMLearn, please contact me.

All students have access to Microsoft Office 365 through the University. You are strongly encouraged to save your work using OneDrive (cloud storage) to help prevent the loss of assignments due to computer or technology failures.

To minimize distractions during class, please ensure that your cell phone is set to silent or vibrate. If you need to make or answer a phone call, please leave the classroom before doing so.

Course Schedule

The table below outlines the tentative schedule for the course, including the topics to be covered, important dates, and assessment deadlines. While every effort will be made to follow this schedule, it may be modified at the instructor's discretion to accommodate the pace of the class, unforeseen circumstances, or the learning needs of the students. Any changes to the schedule will be communicated during class and posted on UMLearn, where appropriate.

<i>DATE</i>	<i>TOPIC</i>	<i>EVALUATION (DUE DATE)</i>
SEPT 9	Lecture 1: Introduction to Critical Thinking and Skepticism in Environmental Science and Geography	
SEPT 16	Lecture 2: Logic and Scientific Reasoning	
SEPT 23	Lecture 3: Cognitive Bias and Decision Making	Quiz #1
SEPT 30	NO CLASSES – ORANGE SHIRT DAY	
OCT 7	Lecture 4: Logical Fallacies, Misinformation and Pseudoscience	Assignment #1
OCT 14	Lecture 5: Scientific Evidence and Evaluation of Research	Quiz #2
OCT 21	Lecture 6: Reading and Critiquing Scientific Literature	Term Paper Outline
OCT 28	Lecture 7: Developing Research Questions and Scientific Hypotheses	Assignment #2
NOV 4	Lecture 8: Interpreting Data and Drawing Scientific Conclusions	Quiz #3
NOV 11	NO CLASS – FALL BREAK	
NOV 18	Lecture 9: Ethics, Integrity and Reproducible Science	
NOV 25	Lecture 10: Scientific Communication: Writing and Presenting Evidence-Based Arguments	Assignment #3
DEC 2	Lecture 11: Applying Critical Thinking to Contemporary Environmental Issues	Quiz # 4
DEC 9	NO CLASS	Term Paper (at 11:59 pm)

Assessment Descriptions

Your performance in this course will be evaluated through five assessment categories assignments, quizzes, a paper outline, and a term paper, and participation. The following section provides a description of each assessment and its weighting toward the final course grade.

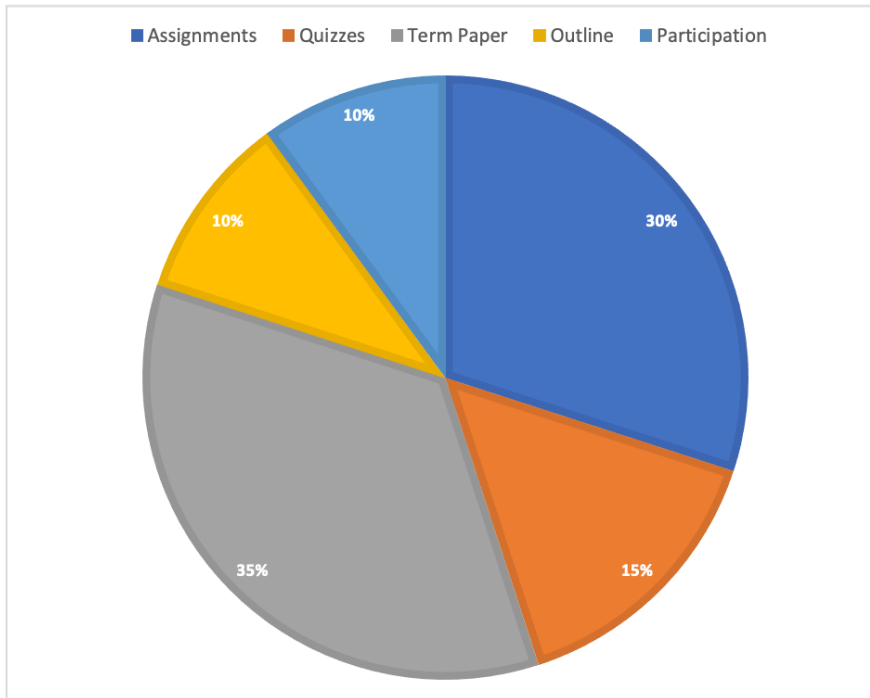


Figure 1. Breakdown of course assessments for ENVR 2810

Assignments (30% of final grade)

Three in-class assignments will be completed throughout the term. Each assignment is designed to assess your ability to apply the critical thinking principles and concepts discussed in the lectures.

Assignment questions will be distributed one week in advance to allow students time to reflect on the issues and prepare their ideas. On the scheduled assignment date, students must attend class and write their responses beginning at 2:30 p.m. Students will have 30 mins to write their answer to the question provided to them. Assignments are to be completed independently, without notes or the use of electronic devices. All work must represent the student's own understanding and comply with the course's academic integrity expectations (see the Academic Integrity section of this syllabus).

Quizzes (15% of final grade)

Students are required to complete four in-class quizzes during the term; however, only the best three quiz grades will be used in calculating the final course grade. Each counted quiz is worth 5% of the final grade. Quizzes are not cumulative and will assess material only from the lectures specified below:

- Quiz 1: Lectures 1 and 2
- Quiz 2: Lectures 3 and 4
- Quiz 3: Lectures 5, 6 and 7
- Quiz 4: Lectures 8 and 9

There is no quiz for Lectures 10 and 11.

The quizzes are intended to help students assess their understanding of the course material, including both lecture content and assigned readings. Each quiz will be written in class on the scheduled date, beginning at 2:30 p.m. Students will have 25 minutes to complete 20 multiple-choice or true/false questions.

Quizzes must be completed independently. The use of notes, textbooks, cell phones, smartwatches, calculators, or any other electronic or external resources is not permitted during the quiz.

Term Paper (35% of final grade)

Students are required to complete a term paper worth 35% of the final course grade. One of the primary goals of this course is to develop your ability to critically evaluate environmental issues using scientific evidence rather than personal opinion, ideology, or misinformation.

The paper should be written as a technical document that presents a clear thesis statement supported by credible scientific evidence, logical reasoning, and well-developed arguments. Students must select a topic from a list provided by the instructor by the end of the first week of classes. To encourage a broad range of topics, each student must choose a different topic. Unless explicitly authorized, generative AI tools may not be used to complete assessed work.

Detailed information about the purpose, objectives, formatting requirements, grading rubric, and submission procedures for the term paper will be provided on UMLearn. The term paper must be submitted by 11:59 p.m. on the due date listed in the Course Schedule section of this syllabus.

Term Paper Outline (10% of final grade)

Students are also required to submit a term paper outline worth 10% of the final course grade. The purpose of the outline is to develop a detailed plan for the final paper and to receive instructor feedback before beginning the writing process.

The outline is a required component of the term paper. Students who do not submit the outline by the specified deadline will receive a grade of 0 for both the outline and the final term paper.

Additional information regarding the term paper outline, including its purpose, requirements, formatting, grading criteria, and submission procedures, will be available on UMLearn. The outline must be submitted by 11:59 p.m. on the due date listed in the Course Schedule section of this syllabus.

Class Participation (10% of final grade)

The knowledge and skills developed in this course depend, in part, on active engagement with course material and participation in learning activities. The participation grade is based on class attendance (6%), engagement in class discussions and activities (4%).

At the beginning of each class, students will be asked to record their attendance by entering their University of Manitoba email address in Mentimeter. Students must use their official UM email address; submissions using other email addresses will not be accepted. If the login page is unavailable, students should restart their web browser and try again. Repeated lateness may affect participation credit since students will not be able to enter their UM email address in Mentimeter at the beginning of class.

I recognize that unforeseen circumstances may occasionally affect attendance. Students are therefore not required to attend every class to receive full participation marks. Consideration will be given for

documented or legitimate medical, compassionate, accessibility-related, or religious reasons that may prevent attendance.

Throughout lectures, students will be asked to respond to both closed- and open-ended questions using Mentimeter. These activities are intended to encourage engagement with course content and provide the instructor with opportunities to assess student understanding and address areas requiring clarification.

Grading Scale

The following table outlines the grading scale used in this course. Please note that extra credit opportunities are not available. However, not all assessments will be included in the calculation of your final grade (see the Assessments section for details). Final course grades are subject to approval by the Department of Environment and Geography.

<i>LETTER GRADE</i>	<i>PERCENTAGE RANGE</i>	<i>DESCRIPTION</i>
A+	90-100	Exceptional
A	80-89.9	Excellent
B+	75-79.9	Very Good
B	70-74.9	Good
C+	65-69.9	Satisfactory
C	60-64.9	Adequate
D	50-59.9	Marginal
F	0-49.9	Failure

Course Policies

Assessment Extension and Late Penalty

Because the assignments are completed in class, students are expected to arrive on time. Additional writing time will not be provided to students who arrive late.

Extensions for in-class assignments may be granted only under exceptional circumstances (see the list of acceptable reasons below). Students must have received approval from the instructor at least **48 hours before** the scheduled assignment date. Requests for extensions made after the deadline, or within 48 hours of the deadline, will normally not be considered except in exceptional circumstances.

If an extension is approved, the student will be given a different assignment question on the Friday following the original assignment date and must complete the assignment in person on the following Monday at 2:30 p.m.

Extensions will not be granted for the term paper outline, as timely submission is necessary to allow sufficient time for instructor feedback before the final paper is written. Extension requests for the term paper will follow the same procedures and requirements as those outlined above for the in-class assignments.

To maintain academic integrity and fairness, no extensions or make-up quizzes will be provided. Students are permitted to miss one quiz for any reason, as only the best three of the four quizzes are used to calculate the final course grade. If a student misses a quiz, the remaining three quizzes will

each be worth 5%, for a total of 15% of the final grade. No additional accommodation will be provided for a second missed quiz, regardless of the reason.

Examples of acceptable reasons for an extension or deferred assessment include:

- a death or serious illness in the immediate family
- illness or medical circumstances affecting the student or a dependent
- required travel related to employment, varsity athletics, or other university-approved obligations
- compassionate or accessibility-related circumstances, including religious observances

Examples of unacceptable reasons for an extension include:

- having coursework due for another class on the same day
- personal travel, holidays, or vacations
- being too busy with other coursework or personal commitments
- failure to attend lectures or keep up with course material
- technical difficulties such as computer malfunctions, lost files, or internet issues
- transportation issues (e.g., vehicle breakdowns) that prevent timely submission
- any other reason deemed inappropriate by the instructor

Students are encouraged to plan ahead and maintain backup copies of all assessments to avoid preventable issues with submission.

Voluntary Withdrawal Date

The voluntary withdrawal date for this course is **November 24, 2026**, this is the last date for withdrawing from this course without academic penalty. Evaluative feedback will be provided prior to this date.

Academic Integrity

Academic Integrity: Academic dishonesty (plagiarism, cheating) is a very serious matter in any academic institution and is dealt with severely at the University of Manitoba.

Please refer to these specific course requirements for academic integrity for individual work in this course:

- i. Unless otherwise stated, complete the assessments for this class by yourself with no help from your class peers, family members, or from tutors that are not approved by me. If you need assistance, please contact me immediately for support and/or to arrange for approved supports.
- ii. Do not share course materials (e.g., lectures, notes, exam questions, assignment instructions, article) that have been created by me or were authored by another person. Unpermitted sharing of such materials with your peers or with note-sharing companies, such as One Class, Course Hero, or Chegg (or other similar websites), is a violation of Copyright Law.
- iii. Students can work in study groups and consult their peers regarding general questions about assessments; however, the submitted assessment must be original work by the student.
- iv. Do not submit assessments already graded in another course.

Plagiarism, duplicate submission, cheating on quizzes, tests, and exams, inappropriate collaboration, academic fraud, and personation are violations of the Student Discipline Bylaw and will lead to the serious disciplinary action. Visit the Academic Calendar, Student Advocacy, and Academic Integrity web pages for more information and support.

To plagiarize is to take ideas or words of another person and pass them off as one's own. In short, it is stealing something intangible rather than an object. Plagiarism applies to any written work, in traditional or electronic format, as well as orally or verbally presented work. Obviously, it is not necessary to state the source of well-known or easily verifiable facts, but students are expected to appropriately acknowledge the sources of ideas and expressions they use in their written work, whether quoted directly or paraphrased. This applies to diagrams, statistical tables and the like, as well as to written material, and materials or information from Internet sources. **Students must use APA style to properly reference work. Students will be penalized 10% if another style or footnotes are used.**

Please familiarize yourself with the University policy on academic dishonesty found on the following website: <https://umanitoba.ca/student-supports/academic-supports/academic-integrity#:~:text=UM%20considers%20duplicate%20submission%20as,using%20a%20previously%20submitted%20paper>. When in doubt about any practice, ask me.

Students are encouraged to review the University policy on Responsibilities of Academic Staff with Regards to Students (ROASS):

<https://catalog.umanitoba.ca/undergraduate-studies/policies-procedures/responsibilities-academic-staff-regard-students-policy/>

Use of Artificial Intelligence

The use of artificial intelligence (AI) tools (e.g., ChatGPT, Gemini, Copilot, or similar generative AI applications) is not permitted for the completion of any course assessments unless explicitly authorized by the instructor in writing. All assignments, quizzes, reports, exams, and other submitted work must represent the student's own original work. Submissions that are generated in whole or in part using AI, or that rely on AI in a manner that violates course instructions, will receive a grade of zero (0). In addition, the use of unauthorized AI may be considered a breach of the University's Academic Integrity policy and may be reported as suspected academic dishonesty, which could result in further disciplinary action in accordance with University regulations. Students who are uncertain whether a particular use of AI is permitted are responsible for consulting the instructor before submitting their work.

Accessibility

The University of Manitoba is committed to providing an accessible academic community. Student Accessibility Services offers academic accommodation supports and services such as note-taking, interpreting, assistive technology and exam accommodations. Students who have, or think they may have, a disability (e.g., mental health, learning, medical, hearing, injury-related, visual) can contact SAS to arrange a confidential consultation.

SAS is located at 520 University Centre (Fort Garry Campus). You contact SAS in person, by phone (204 474 7423) or email (student_accessibility@umanitoba.ca).

Class Communication

You are required to obtain and use your University of Manitoba email account for all communication between yourself and the university. All communication must comply with the Electronic Communication with Student Policy:

http://umanitoba.ca/admin/governance/governing_documents/community/electronic_communication_with_students_policy.html.

Recording Class Lectures

The University of Manitoba and I hold copyright over the course materials, presentations and lectures which form part of this course. No audio or video recording of lectures or presentations is allowed in any format, openly or surreptitiously, in whole or in part without written permission from me.

Copyright Material

Students are expected to respect copyright. Copyrighted content used will be used in this course in accordance with copyright laws and university guidelines. Copyrighted works, including course materials created by me (such as PowerPoints, handouts, or notes), are made available for private study and research and must not be shared or distributed in any format without authorization (including to course note sharing or tutoring websites such as Course Hero, Chegg, etc.). Violating copyright can result in serious consequences for students at the UM, including (but not limited to) allegations of academic and non-academic misconduct. If you have questions or need help see the University's Copyright Office website (<http://umanitoba.ca/copyright/>) or contact um.copyright@umanitoba.ca.

Referencing Style

Assignments requiring references must use APA (7th edition) formatting unless otherwise specified. Information can also be found on the UM Libraries website:

<https://libguides.lib.umanitoba.ca/learning/citing>. Lecture notes are intended as learning resources and should not be used as sources for the case study or outline. Students are expected to cite the original peer-reviewed literature and other appropriate scholarly sources.

UM Policies and Resources

Students should familiarize themselves with the policies and resources at the University of Manitoba under ROASS (Responsibilities of Academic Staff with Regard to Students). A document has been prepared and is available in UMLearn under the Content Tab (titled - *ROASS Schedule A*). If you have any questions about the policies or resources, please contact me. I would be happy to help guide you through anything listed in the document.