Environment and Human Health Syllabus

Department of Health Promotion/Health and Human Performance

ENVS 3400/HPRO 3422 Winter 2026

Dalhousie University acknowledges that we are in Mi'kma'ki, the ancestral and unceded territory of the Mi'kmaq People and pays respect to the Indigenous knowledges held by the Mi'kmaq People, and to the wisdom of their Elders past and present. The Mi'kmaq People signed Peace and Friendship Treaties with the Crown, and section 35 of the Constitution Act, 1982 recognizes and affirms Aboriginal and Treaty rights. We are all Treaty people.

Dalhousie University also acknowledges the histories, contributions, and legacies of African Nova Scotians, who have been here for over 400 years.

Course Instructor

Name	Email	Office Hours
Abraham Munene	Abraham.Munene@dal.ca	Thursdays, 12.00-13.00

Course Teaching Assistant(s)

Name	Email	Office Hours
Alex Bevilacqua	Alex.Bevilacqua@dal.ca	Thursdays, 11.30-12.30
Arinze Uzoezie	Arinze.Uzoezie@dal.ca	Wednesdays, 12.00-13.00

Course Description

This course examines the relationships between the health of populations and health determinants in the context of environmental sustainability. Weekly laboratory exercises will teach students how epidemiology and geographic information science can be used to assess the links between the health of human populations and the health of the environment, and how to use these tools for environmental health research.

Course Prerequisites

Must be a third-year student or have permission of instructor.

Course Exclusions

None

Course Structure

Course Delivery

Lectures, journal clubs, and tutorials are to be delivered in-person (unless otherwise noted). Lectures will not be recorded, except for students requiring special academic accommodation.

Journal Club (40%)

A journal club is a regular gathering of people (generally in academic settings) who meet to discuss a reading or scientific paper found in a peer-reviewed research journal. A preassigned team will present a summary of a chosen paper that the whole group has read. Then, the discussion begins. Attendees ask clarifying questions, inquire about different aspects of the study design, critique the methods, and bring a healthy amount of constructive criticism and skepticism to the results. Each of you will be assigned to run journal club and as a group will assign responsibilities for summarizing the reading and developing questions to stimulate discussion. Please refer to the assignment's document on Brightspace for details.

Tutorials (30%):

Tutorials will be completed in the computer lab. The labs are designed to allow you to investigate the relationships between the environment and human health. The labs are GIS-focused. While some labs can usually be completed in the class time allotted, there will be occasions when you will need to complete the work outside of class time.

Access to ArcGIS or ArcGIS Pro™ 2.5 is required. Two access methods for ArcGIS Pro™ are provided in this class: 1) available to download through the Dalhousie Software resources to run on a Windows Operating System, or 2) Students are responsible for ensuring they have either an appropriate computing resource (*i.e.,* computer and internet)

Individual project (10%)

For this assignment you will analyze an environmental health issue or problem that is of interest to you. You may also choose to assess the impacts of a problem in a specific locality or geographic setting if relevant. Select a topic of interest, with approval from the course instructor. The term paper will follow the traditional style of a scientific article with an introduction, methods, results, discussion, and conclusions sections with a word count between 1000-1200 (excluding references). Details on what is expected within the term paper will be made available to you during lectures or on Brightspace.

Final exam (20%)

A final exam worth 20% of your grade will be held during the final exam period. You will have 1 hour to write a final exam designed to evaluate your understanding and synthesis of the

major topics and themes from the course. Exam questions will include materials from lectures, journal clubs and assigned readings. The final exam period is April 9 – 26, 2026. This is a closed or no book exam.

Assessment

Assignments

	HPRO 3422	Due date
Journal Club	40%	See class schedule
Tutorials (lab)	30%	See class schedule
Individual Project	10%	March 10th
Final Exam	20%	Between April 9th and 16th

All lab reports are to be submitted electronically through Brightspace or in person by the due date specified by the lab instructor. Late lab reports will not be accepted.

All submitted work must include your name and BOO# along with the assignment number and title

Conversion of numerical grades to final letter grades follows the Dalhousie Grade Scale

A+ (90-100)	B+ (77-79)	C+ (65-69)	D (50-54)
A (85-89)	B (73-76)	C (60-64)	F (0-49)
A- (80-84)	B- (70-72)	C- (55-59)	

Lecture location

Tuesdays and Thursdays from 8.35 am to 9.55 am, Studley LSC- Common area C244

Tutorials (labs) location

Thursdays from 10.05 am to 11.25am, in Studley Sir James Dunn Building 301A

Course Materials

There are no textbooks for this course. Only assigned readings.

Course Policies on Missed or Late Academic Requirements

Assignments are due on the date specified on the course schedule. If an assignment is not submitted by the specified time, 10% of the absolute grade for that assignment will be deducted. Additional 10% deductions will be added for each calendar day that the assignment is late.

In extraordinary circumstances, missed academic requirements will be considered on an individual basis. Please consult the latest university regulations on eligible leaves.

Course Policies related to Academic Integrity

Journal clubs are to be completed in teams. Students are expected to work together and make integral contributions to the team.

Tutorial projects are to be completed individually or in small teams.

Term papers are to be completed individually.

Plagiarism and/or collusion are not tolerated. Disciplinary action will be taken in violations of academic honesty. Any assignment in which academic dishonesty is detected will be automatically given a zero. Plagiarism software may be used in the evaluation of assignments. More information about university policies and statements are provided in this document.

We will not accept assignments produced by generative AI and large language models (e.g., ChatGPT).

Learning Objectives

• Describe concepts in environmental exposure science, epidemiology, and population health

• Acquire knowledge of major environmental health issues

• Critically evaluate environmental health issues from a systems perspective

• Learn and apply methods in epidemiology and spatial analysis to investigate and assess health risks and benefits associated with environmental exposures

• Develop an appreciation for the complexity of environmental health challenges

• Participate in active learning, teamwork, and self-directed learning beyond the classroom

Course Content

Class schedule Winter 2026

Week	Date	Topic, Readings, and Assignments
1	Thu 8 Jan	**Introductory Lecture, course orientation and syllabus review**
	Thu 8 Jan	**Readings for next week's lecture and journal club 0** Lecture reading for next week: McCally M. Environment, Health and Risk. In Life Support: The Environment and Human Health. Cambridge, Mass: MIT Press, 2002. pp. 1-14. JC readings: Primary Prevention of Cardiovascular Disease with a Mediterranean Diet. Estruch et al., 2013 New England Journal of Medicine. Accruing evidence on benefits of adherence to the Mediterranean diet on health: an updated systematic review and meta-analysis. Sofi et al., 2010 American Journal of Clinical Nutrition.
	Thu 8 Jan	**Tutorial 0** Lab 0 Accessing ArcGIS Pro and File Management **(not graded)**
2	Tue 13 Jan	**Environmental Health** Lecture reading for next week: The Practice of exposure assessment: A state-of-the-art review Paustenbach 2000 Journal of Toxicology and Environmental Health pages 178-189 only.
	Thu 15 Jan	**Tutorial 1** **Introduction to ArcGIS/ ArcGIS Pro**
	Thu 15 Jan	Journal club 0 **(not graded)**
3	Tue 20 Jan	**Exposure Assessment** Lecture reading for next week: Gordis reading pages 1-18.
	Thu 22 Jan	**Tutorial 1 work week**
	Thu 22 Jan	Journal club 1
4	Tue 27 Jan	**Epidemiology** Lecture reading for next week: Influences on domestic well water testing behavior in a Central Maine area with frequent groundwater arsenic occurrence Flanagan et al., 2015 Science of the Total Environment pages 1274-1281.

	Thu 29 Jan	**Tutorial 2** Databases in GIS: Queries and Joins (Lab 1 due)
	Thu 29 Jan	Journal club 2
5	Tue 03 Feb	**Water pollution** Lecture reading for next week: Exploring pathways linking greenspace to health: Theoretical and methodological guidance Markevych et al., 2017 Environmental Research pages 301-317.
	Thu 05 Feb	**Tutorial 2 work week**
	Thu 05 Feb	Journal club 3
6	Tue 10 Feb	**Green spaces** Lecture reading for next week: Assessment of the effect of cold and hot temperatures on mortality on Ontario, Canada: a population-based study Chen et al., 2016 Canadian Medical Association Journal Open pages 49-57.
	Thu 12 Feb	**Tutorial 3** Exploring variation in air pollution among elementary schools In Halifax (Lab 2 due)
		Journal club 4
7	**Feb 16- Feb20**	**NO CLASS: READING WEEK** **Tutorial 3 work week**
8	Tue 24 Feb	**Extreme temperatures** Lecture reading for next week: How well do people understand the climate impact of individual actions? Wynes et al., 2020 Climate Change pages 1521-1534.
	Thu 27 Feb	Journal club 5
	Thu 27 Feb	**Tutorial 4** Applying GIS to Climate Change: Sea Level Rise (Lab 3 due)
9	Tue 03 Mar	**Environmental psychology**

		Lecture reading for next week: Why sustainable population growth is a key to climate change and public health equity Howat & Stoneham 2011, Health Promotion Journal of Australia, pages 34-38.
	Thu 05 Mar	**Tutorial 4 work week**
	Thu 05 Mar	Journal club 6
10	Tue 10 Mar	**Drivers of Environmental and Health Challenges** Lecture reading for next week: From "one medicine" to "one health" and systemic approaches to health and well-being Zinsstag et al., 2011, pages 148-156.
		Term essays due
	Thu 12 Mar	**Tutorial 5** Remote sensing and West Nile virus (Lab 4 due)
	Thu 12 Mar	Journal club 7
11	Tue 17 Mar	**One Health** Lecture reading for next week: Climate change and human health: present and future risks McMichael et al., 2006, Lancet pages 859-869
		Tutorial 5 work week
	Thu 19 Mar	Journal club 8
12	Tue 26 Mar	**Guest lecture by Dr. Sangay Rinchen** **(Charles Sturt University Australia)** Lecture reading for next week: Findings from the Series of Workshops In Whose Backyard? Exploring Toxic Legacies in Mi'kmaw and African Nova Scotian Communities Waldron, 2015, Environmental Justice pages 1-5.
	Thu 26 Mar	**Tutorial 6** Neighbourhood greenness and risk of chronic disease (Lab 5 due)
	Thu 27 Mar	Journal club 9
13	Tue 31 Mar	**Environmental Ethics and Justice** No reading
	Thu 02 Apr	Journal club 10
	Thu 02 Apr	**Tutorial 6 due**

	Tue 07 Apr	**Course review before final exam**

Student Resources

The following campus services are available to help students develop skills in library research, scientific writing, and effective study habits. The services are available to all Dalhousie students and, unless noted otherwise.

Service	Support Provided	Contact
General Academic Advising	Help with - understanding degree requirements and academic regulations - choosing your major - achieving your educational or career goals - dealing with academic or other difficulties	In person: Killam Library Rm G28 By appointment: - e-mail: advising@dal.ca - Phone: (902) 494-3077 Advising - Academic Support - Dalhousie University Indigenous Student Centre - Campus Life - Dalhousie University Black Student Advising Centre - Campus Life - Dalhousie University
Libraries - Dalhousie University	Help to find books and articles for assignments Help with citing sources in the text of your paper and preparation of bibliography	In person: Service Point (Ground floor) By appointment: Identify your Subject Liaison Directory - Libraries - Dalhousie University
Study Skills/Tutoring - Academic Support - Dalhousie University	Help to develop essential study skills through small group workshops or one-on-one coaching sessions Match to a tutor for help in course-specific content (for a reasonable fee)	To make an appointment: - Call (902) 494-3077 - email Coordinator at: sfs@dal.ca or - Simply drop in to see us during posted office hours
Writing Centre - Academic Support - Dalhousie University	Meet with a tutor to discuss writing assignments (e.g., lab report, research paper, thesis, poster) Learn to integrate source material into your own work appropriately	To make an appointment: - Visit the Centre (Rm G40C) and book an appointment - Call (902) 494-1963 - email: writingcentre@dal.ca

	Learn about disciplinary writing from a peer or	
Other supports Student Health & Wellness | Dalhousie University Dalhousie Student Advocacy Service — Dalhousie Student Union (dsu.ca) Ombudsperson - Student Rights & Responsibilities - Dalhousie University	Student wellness Student Advocacy Office of the Ombudsperson	

Safety

Biosafety - Environmental Health and Safety - Dalhousie University

Chemical Safety - Environmental Health and Safety - Dalhousie University

Radiation Safety - Environmental Health and Safety - Dalhousie University

Scent Free - Environmental Health and Safety - Dalhousie University

University Policies and Statements

Recognition of Mi'kmaq Territory

Dalhousie University would like to acknowledge that the University is on Traditional Mi'kmaq Territory. The Elders in Residence program provides students with access to First Nations elders for guidance, counsel, and support. Visit or e-mail the Indigenous Student Centre at 1321 Edward St or elders@dal.ca. Additional information regarding the Indigenous Student Centre can be found at: https://www.dal.ca/campus_life/communities/indigenous.html

Internationalization

At Dalhousie, 'thinking and acting globally' enhances the quality and impact of education, supporting learning that is "interdisciplinary, cross-cultural, global in reach, and orientated toward solving problems that extend across national borders." Additional internationalization information can be found at: https://www.dal.ca/about-dal/internationalization.html

Academic Integrity

At Dalhousie University, we are guided in all our work by the values of academic integrity: honesty, trust, fairness, responsibility, and respect. As a student, you are required to demonstrate these values in all the work you do. The University provides policies and procedures that every member of the university community is required to follow to ensure academic integrity. Additional academic integrity information can be found at: https://www.dal.ca/dept/university_secretariat/academic-integrity.html

Accessibility

The Student Accessibility Centre is Dalhousie's centre of expertise for matters related to student accessibility and accommodation. If there are aspects of the design, instruction, and/or experiences within this course (online or in-person) that result in barriers to your inclusion, please contact the Student Accessibility Centre (https://www.dal.ca/campus_life/academic-support/accessibility.html) for all courses offered by Dalhousie with the exception of Truro. For courses offered by the Faculty of Agriculture, please contact the Student Success Centre in Truro (https://www.dal.ca/about-dal/agricultural-campus/student-success-centre.html)

Conduct in the Classroom – Culture of Respect

Substantial and constructive dialogue on challenging issues is an important part of academic inquiry and exchange. It requires willingness to listen and tolerance of opposing points of view. Consideration of individual differences and alternative viewpoints is required of all class members, towards each other, towards instructors, and towards guest speakers. While expressions of differing perspectives are welcome and encouraged, the words and language used should remain within acceptable bounds of civility and respect.

Diversity and Inclusion – Culture of Respect

Every person at Dalhousie has a right to be respected and safe. We believe inclusiveness is fundamental to education. We stand for equality. Dalhousie is strengthened in our diversity. We are a respectful and inclusive community. We are committed to being a place where everyone feels welcome and supported, which is why our Strategic Direction prioritizes fostering a culture of diversity and inclusiveness (Strategic Priority 5.2). Additional diversity and inclusion information can be found at: http://www.dal.ca/cultureofrespect.html

Student Code of Conduct

Everyone at Dalhousie is expected to treat others with dignity and respect. The Code of Student Conduct allows Dalhousie to take disciplinary action if students don't follow this community expectation. When appropriate, violations of the code can be resolved in a reasonable and informal manner - perhaps through a restorative justice process. If an informal resolution can't be reached, or would be inappropriate, procedures exist for formal dispute resolution. The full Code of Student Conduct can be found at:
https://www.dal.ca/dept/university_secretariat/policies/student-life/code-of-student-conduct.html

Fair Dealing Policy

The Dalhousie University Fair Dealing Policy provides guidance for the limited use of copyright protected material without the risk of infringement and without having to seek the permission of copyright owners. It is intended to provide a balance between the rights of creators and the rights of users at Dalhousie. Additional information regarding the Fair Dealing Policy can be found at: https://www.dal.ca/dept/university_secretariat/policies/academic/fair-dealing-policy-.html

Originality Checking Software

The course instructor may use Dalhousie's approved originality checking software and Google to check the originality of any work submitted for credit, in accordance with the Student Submission of Assignments and Use of Originality Checking Software Policy. Students are free,

without penalty of grade, to choose an alternative method of attesting to the authenticity of their work and must inform the instructor no later than the last day to add/drop classes of their intent to choose an alternate method.

Student Use of Course Materials

Course materials are designed for use as part of this course at Dalhousie University and are the property of the instructor unless otherwise stated. Third party copyrighted materials (such as books, journal articles, music, videos, etc.) have either been licensed for use in this course or fall under an exception or limitation in Canadian Copyright law. Copying this course material for distribution (e.g. uploading to a commercial third-party website) may lead to a violation of Copyright law.