ENV4001H: Graduate Seminars in Environment and Health
Winter 2023

I. CONTACTS

Instructor: Prof. Clare Wiseman
Office: Earth Sciences, Rm. 2097
Virtual Office Hours: Scheduled as needed
Email: clare.wiseman@utoronto.ca

Student Seminars: Wednesdays, 4:00-7:00 PM (Location: PB 255)
Public Seminars: Wednesdays, 4:00-5:30 PM (to be held virtually using Zoom)

II. COURSE OVERVIEW

Course Description: There is a pressing need to study the complex relationships between the environment and human health, especially as we are increasingly challenged by environmental health issues. This course introduces students to various issues related to environment and health in providing an academic environment of inquiry and dialogue where graduate students from various disciplines can exchange ideas, information and insights. Through participation in the affiliated public environment and health seminar series and student-led seminars, the aim is to expose the students to the many ways that issues related to the environment and health are framed, examined, discussed and addressed. The course will stimulate students to reflect on this diverse discussion and to integrate their work into a broader context and perspective. Students will have the opportunity to explore linkages between environmental factors and health issues as these intersect with environmental and health policy, toxicological impacts, psychosocial factors, economic factors and ethical and legal issues.

Educational Objectives: Upon course completion, students will be expected to:

- Have an understanding of the complex, interdisciplinary nature of environment and health issues,
- Have an understanding of the importance of cross-disciplinary dialogue to fully comprehend how human health and the environment are interconnected and to develop effective interventions, and
- Have acquired the skills necessary to research and critically assess scholarly information on topics related to environment and health and to communicate them in a manner that fosters interdisciplinary dialogue and engagement.

III. HOW THE COURSE IS ORGANIZED

Course Delivery:

This course will be using a mixed in-person and online format for seminars. For student seminars, we will be meeting in person (PB 255). The public seminars will be held online using Zoom (links to be provided). Please refer to schedule at the end of syllabus for dates and seminars.

Please note: We will be meeting in PB 255 at 4:10 on the first day of class (January 11, 2023).

The course uses Quercus for the provision of course materials, submission and completion of assignments and important communications between instructor and students. To access the Quercus-based course website, go to the UofT portal login page at http://portal.utoronto.ca and log in using your UTORid and password.

The course content changes from year to year, as it is based on environment and health topics presented by invited experts (see the course schedule at the end of the syllabus for topics and dates). Speakers are chosen in a manner to ensure a breadth of topics of importance are presented from a range of disciplinary and interdisciplinary-based perspectives, spanning the natural sciences, social sciences and humanities. These talks are also open to the public and take place every two weeks, once the seminar series begins. Students enrolled in the course will choose one of the scheduled topics of interest to facilitate an in-class seminar (students and instructor only), which typically take place one week in advance of each respective public talk. **Please note: Students will need to choose a topic/seminar to facilitate an in-class discussion on the first day of class, as student-led seminars start already in the second week.**
These seminars will provide students the opportunity to more fully engage with various issues associated with the topical areas of focus in the public seminar series. As part of the student-led facilitation, students will be expected to identify readings for the respective topics for the rest of the class (to be approved by course instructor prior to the electronic links being posted on the course's website in Quercus). Students are encouraged to introduce or highlight related ideas, concepts, methodological/conceptual frameworks, etc. from their own respective disciplinary backgrounds to provide a forum of interdisciplinary exchange and discussion.
Depending on course enrollment numbers, students may need to be grouped together in groups of 3-5 individuals to organize and lead a seminar. Student-led seminars are held one week in advance of each respective public talk.

Please note that this is a seminar course. Students will be expected to attend all seminars and actively participate in classes. Students will be expected to be prepared for seminars (assigned readings have been completed and demonstrated thought has been given to the respective topics).

Prerequisites: None

Enrolment Restrictions: Enrolment preference will be given to students who are enrolled in the Graduate Collaborative Specialization in Environment and Health, since ENV4001 serves as the core course for this specialization. Nevertheless, students from other graduate programmes who

have an interest in environment and health issues, and who are willing to share a collaborative learning experience, are also invited to enrol. For a description of the Environment and Health Specialization, please see: https://environment.utoronto.ca/graduate/collaborative-specializations/

Evaluation: Students are required to attend all of the public environment and health seminars scheduled between January and April, 2023. The evaluation break-down is as follows:

- Seminar participation (ongoing): 20%
- Literature review proposal (Due: Feb. 8, 2023): 15%
- Seminar presentation/facilitation (Date: TBD): 20%
- Oral presentation of research paper (Date: April 5, 2023): 15%
- Literature review paper (Due: April 5, 2023): 30%

Literature Review Proposal (Due: February 8, 2023): Students will identify an environment and health-related topic of interest that will be the focus of their literature review papers due at the end of the course. Students will prepare an initial literature search for their topics and submit a research paper proposal (electronically via Quercus) on or before February 8, 2023. Students are not restricted to topics addressed in the course, but they must be related to environment and health. The proposal will be approximately 3-4 pages in length (1.5 spacing) and will include the following information:

- A brief background to the topic of focus,
  - Provide a summary, including a description of main concepts of topic, which is detailed enough to inform reader about topic to be explored. This should include a description of topic's significance in an environmental health context (with reference to sources of information/peer reviewed literature)
- A succinct statement of purpose or goal or research question of focus;
- A description of the research strategy that was employed in the literature search, as follows
  - Identification of the keywords or parameters used in the search
  - Description of any limits applied such as year of publication, language, sources, as well as the rationale for these limits
  - Identification of the search engine(s) used/databases explored (e.g. Scopus, Medline, Web of Science)
  - A description of how the search was refined and narrowed;
- A summary of the results, including a description of the number of "hits" obtained and how this may have changed with the placement of additional search limits; and
- A list of the "top ten" articles or other scholarly sources chosen from the literature search as an initial starting point.

Commonly used conceptual frameworks in the public health sciences such as PIE (Population/Problem, Intervention/Issue, Evaluation/Effect) or PEO (Population, Exposure, Outcome) may be adopted for your literature research strategy. You may also find that a concept map/table is helpful, too. Please refer to the module Writing Resources in the modules section of

Quercus for further assistance.

Seminar Facilitation: The student-facilitated seminars (held each week in advance of the scheduled public talks listed at the end of this syllabus) provide an opportunity for the class to more fully explore the topics to be addressed (Dates: in accordance with choice of seminar topic). In consultation with the course instructor, student facilitators will choose relevant articles of interest to be read by the rest of class prior to the student seminars. Articles must be peer-reviewed and accessible via our electronic library system. Full article citations and links to readings (which should not exceed 30-40 pages in total) are to be made available a minimum of one week in advance of the student-led seminars to be posted on the course's website on Quercus. For the seminar facilitation, students are expected to:

- Choose quality and relevant articles for background reading (peer-reviewed);
- Make an attempt to identify important concepts or issues related to the topic presented by the speaker, and perhaps reflecting the position/approach of the disciplinary background of the respective students, to provide the focus of readings and discussion,
- Inform the course instructor of the chosen readings far enough in advance that they can be made accessible at least one week prior to the seminar;
- Make a brief informal presentation at the beginning of the student-led seminars;
- Suggest questions to stimulate and focus the discussion;
- Fully participate and help moderate in-class discussion, as well as helping to moderate break out groups that will be done as part of the public seminar talks (further details to be provided when the course begins).

PLEASE NOTE: **The first student-led seminar will take place on January 18, 2023**, focusing on the topic of the public seminar scheduled for the week thereafter (i.e. Jan. 25th). Given the short timeline for students to prepare for this, topics for student-led seminars will need to be decided on in the first class on January 11, 2023.

Oral Presentation of Literature Review Topic (Date: April 5, 2023): For the last class, students will each present a 5-minute synopsis of their literature review paper topic and its importance (akin to a 3MT presentation), with one PowerPoint slide. The presentation will be followed by 1-2 questions from the students and the course instructor. Students should adopt the same professionalism and discipline that they would follow if they were making a presentation at a scholarly conference. Each student will be evaluated on the following criteria:

- Timing – how well the student adhered to the limitations set for the presentation
- Clarity and organization of content presented (aimed at a non-specialist audience)
- Quality of the slide
- Quality of the responses to questions
- Speaker's demeanour – i.e., clarity of articulation, professionalism, confidence with material

Literature Review Paper (Date: April 5, 2023): The lit review paper, due on the date of the last class, will focus on an environment and health-related question or issue that relates to the student's area of research and/or academic interests. Papers should be 4,000-5,000 words (not

including references) and include the following:

- Introduction to the topic, including a description of its importance in an environment and health context. For this, it is expected that students provide a more detailed and rigorous discussion (including more references to literature) than that outlined in the initial proposal. The introduction should also include a clear statement regarding the paper's purpose, goal, or research question. This may be the same as that used in the proposal. However, in most cases, it is expected that the original stated the purpose, goal or research question has undergone refinement during the information gathering and analysis phase.
- Methods: Similar to that expected in the public health sciences, papers should include a method section that details the methods used to identify scholarly, literature sources for review, including a description of the keywords and databases which were used (e.g. Medline) and the inclusion/exclusion criteria employed to choose articles. The methods should be kept very brief and are expected to be more refined relative to those documented in the proposals submitted earlier in the course.
- Discussion: This section is expected to comprise the bulk of the paper; involving an in-depth examination, analysis and discussion of current (peer-reviewed) literature on the topic. Students are expected to not only assess the available evidence but also the current state of knowledge and scientific rigor on the chosen topic in a systematic, objective manner. Issues that may be addressed as part of the discussion include identified gaps in knowledge, strengths/limitation in policy/regulations, an identification of needs in terms of future research and political action, etc., as they relate to the specific topic areas.
- References Cited: Students must list the references cited in the paper in a separate section at the end, using a recognized format (see below for further details). This should ONLY include those references cited in the paper.

Papers are to be submitted electronically as a Microsoft Word (.doc and .docx) file or as a PDF via the course's website on Quercus on (or before) the due date (Deadline: 11:59 PM).

Please note: This course will be using **Ouriginal** for the submission of assignments on the course's website in Quercus. Normally, students will be required to submit their course essays to the University's plagiarism detection tool for a review of textual similarity and detection of possible plagiarism. In doing so, students will allow their essays to be included as source documents in the tool's reference database, where they will be used solely for the purpose of detecting plagiarism. The terms that apply to the University's use of this tool are described on the Centre for Teaching Support & Innovation web site (https://uoft.me/pdt-faq). If you object to using Ouriginal, please see the course instructor to establish appropriate alternative arrangements for submission of your written assignments prior to the submission deadline.

V. COURSE POLICIES

It is recommended that students pay attention to the announcements posted on the course's website on Quercus, as this will be the primary way the instructor will communicate important messages, including ones of an urgent matter should unexpected events occur.

Late Penalties and Deadline Extensions: Late papers will be reduced by 3% of the assignment grade per day (including weekends). Extenuating circumstances may arise that impact your ability to complete an assignment on time. Please discuss these issues with your instructor to make alternative arrangements for submission. Students are expected to discuss these issues with your instructor **before or on the assignment due date** to make alternative arrangements for submission. Students who are absent from class for any reason (e.g., COVID, other illness or injury, family situation) and who require consideration for missed academic work should report their absence through the online Absence Declaration Tool on ACORN (in the Profile and Settings menu). The decision to waive the penalty for late assignments for students that contact the instructor AFTER the deadline will be made at the instructor's discretion.

Please note UofT's policy regarding online conduct and supporting 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. UofT does not condone discrimination or harassment against any persons or communities*."

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 (including the use of phrases verbatim without quotation marks, even if you provide the appropriate reference in brackets or as a footnote).
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.

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/).

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 register with Accessibility Services as soon as possible (https://studentlife.utoronto.ca/task/register-with-accessibility-services/).

Contact information: Accessibility Services Reception: 416-978-8060; Email: accessibility.services@utoronto.ca

Additional Services and Support: The School of Graduate Studies has a range of resources and supports for graduate students (see: https://www.sgs.utoronto.ca/gradhub/resources-supports/) Some of the following may be of particular interest:

- General student services and resources at Student Life
- Health and wellness services at https://studentlife.utoronto.ca/department/health-wellness/
- Full library service through University of Toronto Libraries
- Resources on conducting online research through University Libraries Research
- Graduate writing groups at https://studentlife.utoronto.ca/program/graduate-writing-groups/

Course Schedule 2023 (Subject to Change)

Dates	Seminar type/location	Topic/Seminar Title
Jan 11	Student Seminar (PB 255)	Course Introduction
Jan 18	Student seminar (PB 255)	Student-led discussion of topic to be presented by public speaker on Jan 25: *Using isotopes to apportion urban aerosols to chemically similar sources*
Jan 25	Public seminar (Zoom link to be provided in Quercus)	Title: *Using isotopes to apportion urban aerosols to chemically similar sources* Speaker: Dr. Sourav Das (See following table for speaker information and seminar abstract)
Feb 1	Student seminar (PB 255)	Student-led discussion of topic to be presented by public speaker on Feb 8: *The Minamata Convention on Mercury is Here! So Now What for the Environmental Health Sciences Community?*
Feb 8	Public seminar (Zoom link to be provided in Quercus)	Title: *The Minamata Convention on Mercury is Here! So Now What for the Environmental Health Sciences Community?* Speaker: Prof. Niladri Basu (See following table for speaker information and seminar abstract)
Feb 15	Student seminar (PB 255)	Student-led discussion of topic to be presented by public speaker on March 1: *The HealthyDesign.city initiative: Is your neighborhood good for your health?* (tentative title)
Feb 22	***Reading week***	
March 1	Public seminar	Title (tentative): *The HealthyDesign.city initiative: Is your neighborhood good for your health?* Speaker: Dr. Jeff Brook (See following table for speaker information and seminar abstract)
March 8	Student seminar (PB 255)	Student-led discussion of topic to be presented by public speaker on March 15: *Environmental Health in the One Health approach*
March 15	Public seminar	Title: *Environmental Health in the One Health approach* Speaker: Prof. Hélène Carabin

March 22	Student seminar (PB 255)	Student-led discussion of topic to be presented by public speaker on March 29: *Applying epidemiologic methods to tackle the climate crisis in BC*
March 29	Public seminar	Title (tentative): *Applying epidemiologic methods to tackle the climate crisis in BC.* Speaker: Shirley Chen
April 5	Student seminar (PB 255)	Student presentations of final papers

Public Speakers		**Titles & Abstracts of Public Seminars**
Dr. Sourav Das Postdoctoral Fellow School of the Environment UofT	Dr. Sourav Das is a postdoctoral fellow in the School of Environment, working with Dr. Clare Wiseman. He graduated with a BTech (Hons.) in Civil Engineering from Indian Institute of Technology, Kharagpur in 2012 and a PhD in Environmental Engineering from Texas A&M University in 2021. His research work during his PhD had largely focused on developing methods to trace and quantify source contribution to airborne urban particulate matter using chemical characterization techniques. His current work focuses on the sources, elemental composition, and toxic potential of urban road dust.	Title: *Using isotopes to apportion urban aerosols to chemically similar sources* Abstract: Mineral dust arising from soil/road dust resuspension, construction activities, and long-range transport of crustal material is a major source of particulate matter (PM) of human health concern in many urban airsheds. Commonly applied techniques using elemental markers are often limited in the ability to trace and distinguish these sources, due to overlapping chemical profiles. It was hypothesized that coupled isotope ratios of Strontium-Neodymium-Hafnium (Sr-Nd-Hf) are superior to elemental markers in distinguishing these mineral sources of PM. For this reason, a novel high-yielding gravity flow column chromatography scheme was developed for facile and quantitative separation of Sr, Nd, and Hf, which facilitated precise and accurate measurements of their isotope ratios. The developed chromatography scheme was used to fingerprint five potential sources of Sr, Nd, and Hf namely (1) motor vehicles, (2) petroleum refining (3) local soil (4) concrete/cement dust from construction activities and (5) trans-Atlantic North African dust, a prominent summertime PM source in southeastern United States. A novel mass balance model was developed that combined 87Sr/86Sr, 143Nd/144Nd, and 176Hf/177Hf ratios with elemental concentrations to apportion PM2.5 in Houston, Texas to various sources during two North African dust events. The results demonstrate that the use of isotope ratios in aerosol research are better predictors for tracing and quantifying mineral sources of airborne PM2.5; highlighting their potential value in identifying local vs. long-

		distance sources of airborne PM emissions of health concern to help inform decision-making in support of improved air quality in urban environments.
Dr. Niladri Basu Professor, Canada Research Chair in Environmental Health Sciences Dept. of Natural Resource Sciences and School of Human Nutrition McGill University	Professor Niladri Basu holds a Canada Research Chair (CRC) in Environmental Health Sciences at McGill University where he is jointly appointed in the Department of Natural Resource Sciences and the School of Human Nutrition. The goal of Professor Basu's research is to design, validate, and apply innovative and sustainable approaches to address the most pressing societal concerns over toxic chemicals in our environment. Professor Basu's research is multidisciplinary (bridges environmental quality and human health), inter-sectoral (most projects driven by stakeholder needs, notably government and communities), and driven by environmental justice concerns. His team's work has been supported by more than $40M in research funding, resulted in >200 peer-reviewed papers, and afforded training opportunities to over 100 students including 18 postdoctoral fellows and 12 PhD students.	Title: *The Minamata Convention on Mercury is Here! So Now What for the Environmental Health Sciences Community?* Abstract: The Minamata Convention on Mercury is a multi-lateral environmental agreement that entered into force in 2017. The Convention signalled the global commitment by governments to reduce the use and environmental release of mercury in order to protect human health and the environment. With a global policy instrument now in place one may instinctively conclude that future research on mercury pollution is unwarranted. I challenge this notion and propose that now is the time to further escalate our research efforts so as to realize a wider range of benefits. By drawing on my own experiences, I will present on three topics as follows. First, the mercury knowledge base runs deep and wide, and from this base of knowledge the field has been able to break new frontiers not only in mercury sciences but across the environmental sciences. Second, despite a large knowledge base, there are several aspects concerning mercury pollution that remain relatively poorly understood. Notably there is a dearth of information from low- and middle-income countries even though these regions are amongst the most vulnerable to this chemical. Mercury continues to confound matters of public health (e.g., seafood consumption, amalgam) and economic prosperity (e.g., mining), and in doing so exemplifies our continual challenge with risk communication; few researchers are adequately trained on the matter and fewer social scientists are engaged. Finally, mercury cuts across all disciplines and sectors. Third, the onus now shifts from scientists to Parties to the Convention to develop and implement strategies and programs to identify and protect ecosystems and species that are particularly vulnerable, to set targets for mercury exposure reduction, and to develop means for assessing the effectiveness of control measures, for example by monitoring spatial and temporal trends using fish and wildlife indicators. However, to ensure that evidence-based decisions are being taken so as to help ensure that the primary goal of the Convention is met (i.e., Article 1), the environmental sciences community must remain engaged and vocal. This Abstract is based on the following publication: DOI: 10.1002/etc.4269

Dr. Jeff Brook Associate Professor, Occupational and Environmental Health Division, Dalla Lana School of Public Health, UofT, Scientific Director and Nominated Principal Investigator, CANUE Co-Director, HealthyDesign.City	Jeffrey Brook has 25 years of experience as an Environment Canada scientist working at the science-policy interface. During this time, he spent 15 years as faculty at the University of Toronto, where he was involved in research, lecturing and graduate student training. He is one of Canada's leading experts in air quality, recognized at all levels of government and academically, including for his substantial contributions in air pollution health research. Dr. Brook has led scientific assessments to inform policy nationally and internationally, and advised multi-stakeholder groups shaping policy. He has led a variety of multi-disciplinary research teams in government, government-academic partnerships and in academia. Recently his efforts have expanded beyond air quality, for example for 8 years he has led the Environmental Working Group of the Canadian Health Infant Longitudinal Development (CHILD) study and co-led the Gene x Environment Research Platform within the AllerGen Network of Centres of Excellence.	*The HealthyDesign.city initiative: Is your neighborhood good for your health?* Abstract forthcoming
Dr. Hélène Carabin Professor, Department of Pathology and Microbiology at the Faculty of Veterinary Medicine, Department of Social and Preventive Medicine, School of Public Health, Université de Montréal	Dr. Hélène Carabin (DVM, MSc in Veterinary Epidemiology, PhD in Epidemiology and Biostatistics) is a Full Professor in the Department of Pathology and Microbiology at the Faculty of Veterinary Medicine and in the Department of Social and Preventive Medicine at the School of Public Health of the Université de Montréal. She holds the Tier 1 Canada Research Chair in Epidemiology and One Health. Her research programme focuses on the implementation of large-scale studies and intervention to better understand risk factors and burden of infectious diseases and to evaluate control programmes, with an emphasis on diseases affecting the most vulnerable populations,	Title: *Environmental Health in the One Health approach* Abstract forthcoming

	and zoonotic diseases, always adopting a One Health approach. She co-leads two pan-Canadian networks, one on One Health governance of infectious diseases and antimicrobial resistance (Global 1HN) and the other on modeling emerging infections (OMNI-RÉUNIS) while taking into account the One Health approach. She leads the Research group on the epidemiology of zoonoses and public health (GREZOSP), leads the "Global One Health" Pillar of the Centre de Recherche en Santé Publique (CReSP) and is a Commissioner on the One Health Lancet Commission. She has published 148 research articles, five letters to the Editor in peer-reviewed journals and 10 book chapters.	
Shirley Chen BC Centre for Disease Control	Shirley Chen is a Field Epidemiologist with the Canadian Field Epidemiology Program at the Public Health Agency of Canada. She is placed at the BC Centre for Disease Control in Environmental Health Services, where she works on a range of projects related to climate change and health. Her work has spanned a wide range of environmental health topics, from biomonitoring to emergence of zoonotic disease to climate and health. Shirley holds a Master of Public Health in Epidemiology with a Collaborative Specialization in Environment and Health from the Dalla Lana School of Public Health, where she once participated in ENV4001 as a student.	Title: *Applying epidemiologic methods to tackle the climate crisis in BC* Abstract: Climate change is the single greatest threat to human health in the 21st century. British Columbia (BC) is already seeing the effects of human-induced climate change. The past several years have been marked by an increase in the frequency and intensity of extreme weather events. Record-shattering temperatures, widespread flooding, and devastating wildfires have led to increased morbidity and mortality from heat-related illness, reduced air quality, and increased exposure to infectious diseases. Indirectly, climate change has impacted human health in BC through economic losses and disruptions in supply chains and infrastructure, widening existing health disparities, and by creating new challenges for already strained public health systems to respond to. In this seminar, I will present various projects currently being undertaken at the BC Centre for Disease Control to prepare for current and future threats to the health of BC residents from climate change.