

Course Description

2021: EPID 835 – Environmental Public Health

This course provides students with a foundation for understanding key areas of environmental health. Students will be provided with a general introduction to the core concepts of the Field (i.e. exposure assessment, toxicology, environmental epidemiology methods and risk assessment). Contaminants or agents of environmental disease are addressed and strategies for assessing and managing environmental hazards reviewed. Applications of environmental health including the assessment and communication of risks and standards in air, water and soil quality are introduced. Environmental health policy implications of critical global issues such as climate change are explored.

Time: Fall Term (2021), Tuesdays 1:00 pm to 4:00 pm

Location: Carruther's Hall, 3rd floor classroom

Instructor: Dr. Harriet Richardson, Dept. Public Health Sciences,

Queen's Cancer Research Institute (CRI), Room 220
Divisions of Canadian Cancer Trials Group and
Cancer Care and Epidemiology (hr1@queensu.ca)
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Prerequisites:

Those with little or no previous background in epidemiology are encouraged to refer to introductory epidemiology textbooks for basic concepts and terminology such as:

Essential Epidemiology: An Introduction for Students and Health Professionals – Second Edition by Penny Webb and Chris Bain (2011)

A Short Introduction to Epidemiology by Neil Pearce, 2005 may be useful and is available on-line (free). <http://publichealth.massey.ac.nz/publications/introepepi.pdf>

Readings:

Textbook: Howard Frumkin. *Environmental Health: From Global to Local*, 3rd edition (2016)

Supplemental readings, as appropriate, will be assigned one week prior to each class.

Rationale

Environmental health is that segment of public health that involves assessing, understanding and controlling the health impact of people on their environment and the impact of the environment on people. The field is defined by the problems it faces as well as the approaches it takes to assess, manage and communicate these. It encompasses the conventional concerns of public hygiene, such as the delivery of safe food and the purification of water, as well as long-range concerns about the effects of toxic chemicals, radioactive wastes and global warming.

The complexity of these issues requires multidisciplinary approaches from a range of experts. Public health practitioners need a sufficient, general grasp of the issues, tools of assessment, policy and program implications to facilitate investigation and action to protect public health.

Format

This course is divided into three main sections. The first section focuses on methods and tools for toxicological and hazardous risk assessment and regulatory standard setting. The rationale for establishing standards to limit exposures is explored and strategies for communicating risks about threshold exceedances are reviewed. This material is covered through traditional lectures blended with online resources and in-class exercises. Evaluation for this section will be based on two in-class quizzes and a final exam.

The second section focuses on environmental contaminants and students will participate in group presentations of selected agents of environmental disease. Critical overarching issues related to global warming, climate change and emergency preparedness will also be explored. The implications of local practice and policy on global environmental health matters will be considered.

The third section applies the tools and concepts covered in the first section to the analysis of major sources of contaminants and pollutants in air, water and soil. Regulatory standards, programs and policies to protect public health in the Canadian context are reviewed. Case studies of recent events where threshold exceedances possibly posed a risk to a population were investigated and mitigated are used to illustrate assessment and response strategies. Evaluation in section 3 will be based on a final exam.

The course is divided into twelve 3-hour sessions. In general the first half of each session is lecture-based learning and the second half involves interactive group learning around cases and discussion points. Occasional guest lecturers with expertise and experience in the topic will be invited to present.

Learning Outcomes

1. To demonstrate the principles of health hazard risk assessment and standards settings
2. To understand epidemiologic methods used in evaluating environmental health outcomes
3. To apply the principles of risk communication in the context of environmental exposures and the regulatory standards
4. To understand the principles of health protection and mitigation of risk pertaining to common chemical, biological and physical contaminants in air, water and soil

Assessment

Assignment	Description	Due	Weight
1	Class quizzes (2)		10%
2	Class participation & in-class activities		10%
2	Health Assessment of an Environmental Contamination		20%
3	Teaching assignment; Group presentations on an assigned environmental contaminant		20%
4	Final Exam		40%

Course Schedule

Week of:	Topic
Sept 14	Introduction (Harriet Richardson) <ul style="list-style-type: none"> Review course objectives, syllabus and evaluation Introduction to environmental health, ecology and ecosystems
Sept 21	Environmental Epidemiology (Harriet Richardson) <ul style="list-style-type: none"> First half: Review causation and study designs, basic epidemiology measures of disease frequency and association Second half: Cancer clusters – lecture and case study (Will King)
Sept 28 (Quiz 1)	Exposure Assessment in Epidemiology (Harriet Richardson) <ul style="list-style-type: none"> First half: Environmental exposure assessment methods Second half: Geospatial data for environmental health
Oct 5	Toxicology and exposure calculations (Harriet Richardson) <ul style="list-style-type: none"> First half: Principles of toxicology and interpreting contaminant profiles Second half: Community exposure calculations and exercises
Oct 12	Occupational exposures and health outcomes (Harriet Richardson) <ul style="list-style-type: none"> First half: Occupational Epidemiology Guest speaker: Vikki Ho (Occupational exposure to endocrine disruptors)
Oct 19 (Quiz 2)	Risk assessment and communication (Erica Weir) <ul style="list-style-type: none"> First half: An approach to investigating human exposure to contaminants in the environment Second half: Theories and approaches to risk perception and communication, including communicating with the media
Oct 26	Environmental Disease Agents (Group teaching assignments) <ul style="list-style-type: none"> Zoonotic and vector borne diseases Toxic metals and elements Pesticides and other organic chemicals Ionizing and non-ionizing radiation
Nov 2	Climate change and human health (Harriet Richardson) <ul style="list-style-type: none"> Greenhouse gases; natural variability and human activities Climate related health risks and risk management of climate change
Nov 9	Water Quality <ul style="list-style-type: none"> First half: Overview of major sources of water contamination, management and protective interventions (Harriet Richardson) Guest lecturer: Natasha Prepas-Strobeck
Nov 16	Air Quality <ul style="list-style-type: none"> First half: Overview of major sources of air contamination, preventive and protective interventions (Harriet Richardson) Guest lecturer: Pierre Villeneuve (Air pollution and negative health outcomes)

Nov 23	Soil quality and waste management (Harriet Richardson) <ul style="list-style-type: none"> • Overview of major sources of soil contamination; preventive and protective interventions • Guest speaker: Élyse Caron-Beaudoin (Fracking in northern communities)
Nov 30	Emergency preparedness and public health response <ul style="list-style-type: none"> • Role of the Public Health Inspector (Guest speaker; Paula Muis) • Emergency preparedness (Erica Weir)
Dec 7	Final Exam -in class

Course objectives, reading materials, and lecture slides as presented in 2021 are available at onQ:

Academic Integrity

Queen’s students, faculty, administrators and staff all have responsibilities for upholding the fundamental values of academic integrity; honesty, trust, fairness, respect, responsibility and courage (see www.academicintegrity.org). These values are central to the building, nurturing and sustaining of an academic community in which all members of the community will thrive. Adherence to the values expressed through academic integrity forms a foundation for the “freedom of inquiry and exchange of ideas” essential to the intellectual life of the University (see the Senate Report on Principles and Priorities <http://www.queensu.ca/secretariat/policies/senate/report-principles-and-priorities>).

Students are responsible for familiarizing themselves with the regulations concerning academic integrity and for ensuring that their assignments and their behaviour conform to the principles of academic integrity. Information on academic integrity is available in the SGS Calendar (<https://www.queensu.ca/sgs/graduate-calendar/academic-integrity-policy>) and from the instructor of this course. Departures from academic integrity include plagiarism, use of unauthorized materials, facilitation, forgery, falsification and unauthorized use of intellectual property, and are antithetical to the development of an academic community at Queen’s. Given the seriousness of these matters, actions which contravene the regulation on academic integrity carry sanctions that can range from a warning or the loss of grades on an assignment to the failure of a course to a requirement to withdraw from the university.

- Plagiarism – including guides on how to use sources correctly.
 - *Regardless of how and where you retrieve information, the principles of academic integrity apply. Please visit these helpful websites to help you make sure that you are able to write things in your own words:*
 - <https://www.queensu.ca/academicintegrity/students/avoiding-plagiarismcheating>
 - <https://integrity.mit.edu/handbook/academic-writing/avoiding-plagiarism-paraphrasing>
 - http://writing.wisc.edu/Handbook/QPA_paraphrase.html
- Groupwork:
 - You are permitted to work with a partner or in groups of up to 3 to encourage collaboration, cooperation, and collective learning on lab assignments. You are not permitted to share answers among large groups or as a tutorial group. You must work independently on quizzes and “pop questions”.

Statement on Copyright of Course Materials

Course materials created by the course instructor, including all slides, presentations, handouts, tests, exams, and other similar course materials, are the intellectual property of the instructor. It is a departure from academic integrity to distribute, publicly post, sell or otherwise disseminate an instructor's course materials or to provide an instructor's course materials to anyone else for distribution, posting, sale or other means of dissemination, without the instructor's express consent. A student who engages in such conduct may be subject to penalty for a departure from academic integrity and may also face adverse legal consequences for infringement of intellectual property rights.

Statement on Academic Accommodations for Students with Disabilities

Queen's University is committed to achieving full accessibility for people with disabilities. Part of this commitment includes arranging academic accommodations for students with disabilities to ensure they have an equitable opportunity to participate in all of their academic activities. The Senate Policy for Accommodations for Students with Disabilities was approved at Senate in November 2016 (see <https://www.queensu.ca/secretariat/sites/webpublish.queensu.ca.uslwww/files/files/policies/senateandtrusteers/ACADACCOMMPOLICY2016.pdf>). If you are a student with a disability and think you may need academic accommodations, you are strongly encouraged to contact the **Queen's Student Accessibility Services (QSAS)** and register as early as possible. For more information, including important deadlines, please visit the QSAS website at: <http://www.queensu.ca/studentwellness/accessibility-services/>

Statement on Academic Consideration for Students with Extenuating Circumstances

Queen's University is committed to providing academic consideration to students experiencing extenuating circumstances that are beyond their control and are interfering with their ability to complete academic requirements related to a course for a short period of time. The Senate Policy on Academic Consideration for Students in Extenuating Circumstances is available at <http://www.queensu.ca/secretariat/sites/webpublish.queensu.ca.uslwww/files/files/policies/senateandtrusteers/Academic%20Considerations%20for%20Extenuating%20Circumstances%20Policy%20Final.pdf>

Each Faculty has developed a protocol to provide a consistent and equitable approach in dealing with requests for academic consideration for students facing extenuating circumstances. SGS students can find the Academic consideration information at: <https://www.queensu.ca/sgs/accommodation-and-academic-consideration>. If you need to request academic consideration for this course, you will be required to provide the name and email address of the instructor/coordinator. Please use the following:

- Instructor/Coordinator Name:
- Instructor/Coordinator email address:

[Statement on Use and Retention of Video Recording](#)

If / when Synchronous (live) classes are delivered in this course through a video conferencing platform, it will be supported by the University [MS Teams, Zoom]. Steps have been taken by the University to configure these platforms in a secure manner. Classes will be recorded with video and audio (and in some cases transcription) and will be made available to students in the course for the duration of the term. The recordings may capture your name, image or voice through the video and audio recordings. By attending these live classes, you are consenting to the collection of this information for the purposes of administering the class and associated coursework. If you are concerned about the collection of your name and other personal information in the class, please contact the course instructor to identify possible alternatives.

To learn more about how your personal information is collected, used and disclosed by Queen's University, please see the general [Notice of Collection, Use and Disclosure of Personal Information](#).