



Department of Geography
Western University

Geography 3432
Environmental Hazards and Human Health

WINTER 2016

COURSE SYLLABUS

Class details:

<i>Location:</i>	<i>Social Science Centre (SSC) – Room 3028</i>
<i>Days and Hours:</i>	<i><u>Class:</u> Wednesdays 2:30-4:30</i> <i><u>Tutorial:</u> Thursdays 10:30-11:30am (TC 131) or 11:30-12:30am (SSC 3014)</i>

Instructor:

Chad Walker

PhD Candidate, Western University

Contact Information

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TA Information

TBD

A brief note...

This syllabus is "dynamic", it may change throughout the term. Though the basic structure of the course (e.g., weighting of evaluation components) will not change, topics and readings may need adjusting along the way.

Prerequisite

- none, but both Geog 3250 and Geog 2152 are assets
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Introduction

This is a survey course regarding the links between human health to environmental hazard exposure. Issues will include the health impacts of water pollution, air pollution, solid and hazardous waste, toxic substances, pesticides, climate change and radiation. The limitations of models and methods will be discussed.

This course consists of two lecture hours per week and one tutorial hour per week. The lecture hours will consist of a mixture of lectures and discussion. Some lecture class time may even be devoted to tutorial-style discussion. The tutorial will involve discussion of selected readings, these readings may be unique to the tutorial (see tutorial schedule) or may also be associated with the lectures (see lecture schedule). Though students are responsible for completing readings prior to each lecture and tutorial, this is especially true for the latter since this is where most of the participation marks will be awarded.

Evaluation

Component	Weight
Participation (tutorial and lecture)	10%
Assignments (two)	30%
Midterm Exam	20%
Photo-reflection assignment	5%
Final Exam	35%

You must complete all course components to pass the course.
No electronic devices - e.g., phones, calculators are allowed at the midterm or exam.

Course goals and objectives

- To help the student to understand the complexities of the connections between environmental hazards and human health
- To facilitate the student's ability to think and write critically about the environmental risks and solutions to them

Lecture Schedule

Date	Lecture topic	Required reading
Jan. 6 th	Scope of course; Syllabus clarifications and additions	None
Jan. 13 th	Introduction – Key Concepts (+ discussion of Assignment 1)	Moeller - Chapter 1
Jan. 20 th	Measuring Health-Environment Links: Toxicology	Moeller - Chapter 2
Jan. 27 th	Measuring Health-Environment Links: Epidemiology	Moeller - Chapter 3
Feb. 3 rd	Contaminants in Air	Moeller - Chapter 5
Feb. 10 th	Risk Assessment and Management (ASSIGNMENT 1 DUE)	None
Feb. 24 th	<u>Midterm Exam (in-class)</u>	None
March 2 nd	Built Environment and Health I (+discussion of Assignment 2)	Frank et al. - Chapters 1 & 3
March 9 th	Built Environment and Health II	Putnam (2000) Chapters 1 & 20
March 16 th	Environment and Health and the Media; Climate Change and Human Health (Course instructor evaluation)	Beseley and Shanahan (2004); Ki-Hyun et al. (2014)
March 23 rd	Environmental Equity and Policy	Cutter (1995)
March 30 th	Video - Nature of Things – Hot Times in the City (examinable) <u>Assignment 2 Due</u>	None
April 6 th	Review for the exam	
TBD	Final Exam (Photo Reflection due)	

Tutorial

Each student is required to complete the readings and have responses to the "think questions" posted by the TAs on WebCt. The think questions will be posted at least a day before tutorial. All are expected to participate in the tutorial discussions. In general you will be critically appraising the readings by summarizing key themes, findings, methods, deficiencies, and directions for future research. Avoid the pitfall of too much summary, focus on critical commentary (e.g., What might a different method reveal? Who was studied, and would it matter if a different group was studied? What is the strength of the evidence relative to the conclusions?)

Tutorial Schedule

Date	Topic	Reading
Jan. 7th	No tutorial	None
Jan. 14th	Introduction and ice-breaker, signup for tutorial facilitation	None
Jan. 21st	Epidemiology in Contaminated Communities (Case Study: Love Canal)	Heath et al. (1984) Bari Kolata (1980) Holden (1980)
Jan. 28th	Water Contamination by Pathogens (Case Study: Walkerton)	Hrudey et al. (2003), Parr (2005)
Feb. 4th	Limits to Epidemiology	Taubes (1995), Taubes (1997)
Feb. 11th	Work on assignment 1	None
Feb. 25th	Built Environment and health (obesity - Case Studies: USA vs Canada)	Morland and Evenson (2009); Seliske et al. (2009)
March 3rd	Built Environment and Health (social capital; Case Studies: Wales and Ireland)	Araya (2006); Leyden (2003)
March 10th	Pesticides and health - Case Study: Mexico	Guillette et al. (1998)
March 17th	Climate Change and Human Health	Hajat et al. (2014)

Examinations – General

There will be two formal examinations during the term (see schedule). The first will take place during regular class period and you will be given all of the time needed; up to 90 minutes.

The format of the midterm is mixed. To try and accommodate all learning styles, the exam will be split into three sections. There will be multiple choice, short answer, and an essay.

The format for the final examination is undecided at this point. It is very likely that it will follow a similar pattern as is described above for the midterm. More information concerning the format will be made available to students shortly. The final exam will focus on material from the second half of the course but will include important ideas and concepts from the entire term.

Missed Exams

If you are unable to take either examination on the date listed in this syllabus (or as in Western's final exam list) please notify myself AND the TA at least 2 weeks prior of your prior commitment. If accepted, you will be presented with an alternative examination to be completed before the regularly scheduled exam. Any other request made after the two week window will require official documentation in order to be excused and made available a new time to write your exam.

Midterm

Weight: 20%

Duration: 1.5 hours

Date: Feb. 24th

Location: SSC 3028

Possible Format: mixed, all answers on exam paper.

i. Multiple choice and true/false - 20

MC usually 1 of 5 choices (a - e)

NOT scantron, circle on exam paper

no "correction factor" (i.e., NO subtraction of incorrect answers from correct answers)

ii. Definitions

iii. Short Answer

Material Covered:

All lectures and readings up until the end of the class immediately prior to the midterm date. The focus will be on lectures, but the readings typically overlap the lectures considerably. Generally speaking you do not have to know specifics like who said what in what year for the multiple choice, but it could not hurt to know some of the more important figures mentioned in class to round out your definitions and short answer.

Final Exam

Weight: 35%

Duration: 3 hours

Date: TBD

Location: TBD

Format: mixed, all answers on exam paper. (100 marks)

i. Multiple choice and true/false - (15 marks)

- MC usually 1 of 5 choices (a - e)

- NOT scantron, circle on exam paper

- no "correction factor" (i.e., NO subtraction of incorrect answers from correct answers)

ii. Definitions

(25 marks)

- 5 marks ea.

- choice - you will choose 5 from at least 7

- identify what the thing is, why it is important, how it relates to other things in environment and health research and provide an example(s)

- I have been told by students that I, "expect a lot in a definition". I agree.

- only those definitions that include an example will receive full marks

- space - use only the space provided - approximately 1/5 of a page

iii. Short Answer

(30 marks)

- 10 marks ea.

- choice - you will choose 3 from at least 5

- address the question directly and include at least one example

- examples- only those short answers that include at least one example will receive full marks

space - use only the space provided - approximately 1/3 of a page

iv. Essay

(30 marks)

- choice - you will choose 1 from 2

- address the question directly and include examples

- space - use only the space provided - approximately 2 1/2 pages

- outline - though there are no marks explicitly awarded for this, sketch an outline on the extra sheet of paper provided (back of last page)

Material Covered:

All lectures and readings since the midterm date. You are also responsible for material you might use in an essay answer. That is, the essay question will be quite general and will allow you to draw on material from the entire course. The focus will be on lectures, but the readings typically overlap the lectures considerably. Generally speaking you do not have to know specifics like who said what in what year for the multiple choice, but it could not hurt to know some of the more important figures mentioned in class to round out your definitions and short answer.

Course Text:

Moeller, D. (2011) Environmental Health (Fourth Edition) Cambridge Mass: Harvard University Press. Other readings will be made available via the links in the schedule and/or WebCT Owl

Exam advice

Although I believe there are no 'secrets' for doing well on the exams in this course, I can offer the following short list of helpful hints:

1. **Attend lectures regularly and take good notes**
2. **Attend and actively participate in the tutorial sessions;** the TAs for the course have been instructed to introduce and review key concepts that may be helpful for your written assignments and/or examinations.
3. **Ask questions during lectures and tutorial that interest you.** Sparking interest in the course material is something I strive for and not only will this help make the class more enjoyable but you will very likely do better in the course as a result.
4. **Meet with fellow classmates** in between classes and particularly before the exams to go over material. Learning others' ideas on the issues brought forth in class may help your understanding.
5. **Visit office hours.** Both myself and the TA have set them up to help you. Please take advantage of this.

Assignments

Submission Policy and Late Policy:

Material will typically be handed in online through OWL (before class starts). There will be a 5%/day penalty for material handed in late (not including weekends, clock starts "ticking" at the START of class). I will not accept assignments once the papers are 'handed back' to the rest of the class.

Illness/Medical Absence

Please see the following policy:

http://www.uwo.ca/univsec/handbook/appeals/accommodation_medical.pdf

And now some messages from our lawyers... plagiarism and Turnitin.com

Plagiarism

The Department of Geography has a zero tolerance policy towards plagiarism. If a student commits plagiarism, the instructor will assign a grade of zero to the assignment. A second instance of plagiarism is regarded as a scholastic offense and will be dealt with according to The University of Western Ontario policy for Scholastic offenses. The most common offense is failing to cite properly - if you quote directly, cite the author! You do *not* get the benefit of the doubt (you are not presumed innocent until proven guilty) when such offenses are committed. That is, the burden of proof is reversed. Can you prove "it was an accident" (this is a rhetorical question)? The following is an excerpt from the university secretariat:

"Scholastic offences are taken seriously and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, at the following Web site: http://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_undergrad.pdf "

Turnitin.com

Unfortunately turnitin has "caught" offenders in this class, please do not be the next one - it is awkward for everyone involved. If you write and cite properly this tool ensures your paper is not marked relative to that of somebody who is plagiarizing. The university has provided this mandatory wording: "All required papers may be subject to submission for textual similarity review to the commercial plagiarism detection software under license to the University for the detection of plagiarism. All papers submitted will be included as source documents in the reference database for the purpose of detecting plagiarism of papers subsequently submitted to the system. Use of the service is subject to the licensing agreement, currently between The University of Western Ontario and [Turnitin.com](http://www.turnitin.com)"

Go to the [Timetable section](#) of the syllabus for turnitin login information.

Assignment 1: NPRI and Pollution over Time and Space

Due – February 10th 2016 (before class)

Objectives

The purpose of this assignment is to "explore" a chemical substance known to have serious health effects. You will become (more) familiar with the National Pollutant Release Inventory (NPRI) as an example of freely available government data. NPRI is a database of point source pollution in Canada. Since the mid 1990s the Canadian government has been collecting this data from companies, who are required by law to submit data on pollutant releases from their facilities. The data has both temporal and spatial dimensions that make it ideal for geographic study. You will extract data for whatever substance you choose to create a brief report on the distribution of the substance over space.

Tasks

1. Pick a substance

Choose a substance that interests you, but please select one that has potentially serious health effects. Visit the NPRI site, specifically the [substance information](#) link that provides links to such

lists as the [Environmental Defense Scorecard](#) site for pollution information site which includes a page specifically on [health effects](#) choose your "favourite" health impact (cancer, developmental, or reproductive), choose "recognized" and go to the substance list.

Some you might consider

- benzene
- styrene
- dioxin (e.g., Tetrachlorodibenzo-p-dioxin)
- furans (e.g., Tetrachlorodibenzofuran)
- mercury
- asbestos
- cadmium
- toluene

2. Get the data

You can get the data from the NPRI website in various forms (e.g., Microsoft Access database file), but perhaps the best way to do this is to copy and paste data from their "[Web Query](#)" form. The upside of this approach is that you only get the data you need and do not have to sort through multiple tabs that the Access database files contain once you convert them to Excel. The down side of the web query approach is that you can only get one year's data at a time, so you will have to do multiple queries.

You need to copy and paste a year's worth of data at a time into an Excel spreadsheet - but do this multiple times, one for each year. In the Web Query form, select a **substance**, and **year**, and switch from **all types** to **total releases**. Copy the resultant table of data from the web page and "paste special" as text (*not* the default, "as html") into Excel and the data should be formatted into columns. Add a year column and insert the year for the entries. Repeat this process for each year. Now you can sort by facility name, province, city, total releases, and year. The distinction between air, land and water is not necessary - most releases are by air (if this is not the case for your substance, it might be worth noting in your write-up. You should have **at least 5 years of data** to allow both a temporal and spatial analysis.

3. Summarize Temporal and Spatial Patterns (e.g, graph)

Manipulate the data to determine spatial (e.g., province) and temporal (i.e., year) patterns - e.g., % of total releases by province and year Graph it perhaps to see patterns more clearly. If you have taken the Geography of Hazards, this may start to sound very familiar.

Questions

Answer all of the following questions in your write-up:

1. What are the most serious health impacts of this substance and how do people typically get exposed to this substance? (3 marks)
2. What are the major sources of this substance (e.g., industries). (3 marks)

(The Scorecard site will help with the questions above, but I encourage you to find an academic journal reference to augment your answer to these questions)

3. Describe the spatial and temporal distribution of this substance. For example, is the substance concentrated in the Prairie Provinces or the Maritime Provinces? Is the substance used mainly in large urban areas? Have releases increased or decreased over time. (10 marks)
4. What are some potential policy implications of what you have found? (4 marks)

Submit

1. Summary graphs and/or tables from Excel spreadsheet (no page max. but be reasonable). We do not need to see the raw data
2. Answers to the above questions. Directly reference figures/tables by number. 1000 word max.
3. Your completed paper to Turnitin It is best to embed your graphs/tables into the text so Turnitin will accept the file.

Marking

30 marks 5 style + 25 content

style (5/30 marks)

- i. **title page** (-1)
- ii. **reference list** (-1)
- iii. **spelling/grammar** (-2 max) - up to two marks can be lost, the first few are free, from then on marks are deducted at the TA's discretion
- iv. **formal style** (-2 max) - other formal style issues (e.g., slang, acronyms, contractions) TA's discretion
- v. **content (25/30 marks)**
 - questions 1-4 (20 marks - breakdown above).
 - graphs and/or summary tables (5 marks)

Assignment 2: Evidence Linking Exposure and Outcome

Due

March 30th 2016 (before class)

Objectives

The purpose of this assignment is to investigate an environment and health issue in detail. You will write a critical essay which assesses the state of evidence on the link between an environmental "exposure" and a health outcome.

Tasks

1. **Pick a topic**

You may pick any topic that is relevant to the course. Here are some examples you might consider:

- health effects of wind turbines
- health, social capital and the built environment
- obesity and suburbanization
- breast cancer and organochlorines
- climate change (specific impact) and human health
- health effects of waste incinerators
- radon, lung cancer and risk communication
- air pollution and health
- health effects of the Sydney Tar Ponds
- health effects of the Chernobyl disaster
- health effects of pesticide X
- psychosocial impacts of noxious facilities

2. **Gather academic literature on the topic**

Focus on finding peer reviewed empirical research - i.e., journal articles and books. Websites typically are not peer reviewed. How much literature is enough? Once you have all the key pieces of writing on the topic you have enough ;)

3. **Assess The Strength of Evidence**

The focus of your search is "evidence", scientific evidence linking the exposure and outcome. Use the skills you have learned in lecture and tutorial to assess how strong various pieces of evidence are. Just because something is published does not mean it is strong evidence. Critically appraise the evidence in each article you read.

4. **Draw conclusions**

If you were in a position to directly affect decisions on controlling the exposure in question, what would you do? What research remains to be done?

Hints

1. Make use of the many journal databases at the library.
2. Google Scholar, is getting better every day.
3. Focus on the most recent papers and work backwards
4. Use the Web of Science Citation Indexes to determine how often particular papers have been cited by others in academia (this gives a sense of how important are the findings).
5. Try evaluating each paper to help you organize your thoughts.

Submit

1. A formal essay, 10 pages max, double spaced, 12 point font, reasonable margins
2. Final paper to Turnitin.

Marking

20 marks 3 style + 17 content

style (3/15 marks)

- i. **title page** (-1)
- ii. **reference list** (-1)
- iii. **spelling/grammar** (-2 max) - up to two marks can be lost, the first few are free, from then on marks are lost at the TA's discretion
- iv. **formal style** (-2 max) - other formal style issues (e.g., slang, acronyms, contractions) TA's discretion

content (17/20 marks)

3. Photo-Reflection

This will be the last (minor) assignment of the term and will represent 5% of your overall grade in the course. It is intended to provide a chance for you to summarize a concept of the course through creative and dynamic means. The idea of this assignment was created by a former colleague Dr. Beth Hundey in 2011. Her value seen in the project is that it:

"...engages alternate learning styles and encourages students to engage with the material more closely and with a greater understanding by applying concepts to their own experiences".

A detailed description is listed below (with permission from Dr. Hundey) and can be taken as the general guidelines for the project. While the project was originally designed for an Introductory Physical Geography class, the same ideas will be used with reference to hazards and human health in this class. You may choose to focus on the physical processes and/or cultural/social/political effects you find important. **NOTE: for this class, you are only to submit one photo and keep your commentary to less than 500 words.** Details about how to submit will be explained later.

Marking (out of 5)

Your job is to convince me that you understand the potential relationships between risk/exposure and health in your photographs, *not* that you can simply research and regurgitate information about a phenomenon or place. To illustrate the depth of your understanding, focus on what can be seen in the photograph and make specific reference when possible to

DESCRIPTION OF PHOTO-REFLECTION ASSIGNMENT

This description is an abbreviated version of what the students will receive at the beginning of the course. The assignment will be handed in at the end of term, with the intention that they will try to relate concepts in lectures and labs to their own experiences throughout the course. See Appendix for one example photo-reflection.

Introduction:

In your day-to-day life and in your travels, you have likely been intrigued by interesting landscapes, landforms, weather patterns, etc. in your surroundings. An understanding of Physical Geography allows us to appreciate these phenomena in a different way, as we begin to understand the processes that create the features that we see. Whether it be an opportunistic plant taking root in a crack in the pavement, a magnificent canyon with layers upon layers of striations, or rain that falls but never quite reaches the ground, Physical Geography is everywhere. In this assignment, you creatively apply the concepts you have learned in any component of Geography 1300b.

Deliverables:

Compile or take 4 *original* photographs that you find interesting and that remind you of something you have learned in Geography 1300b. With each photo, include a typed description of the components/ processes of physical geography as you perceive them in the photograph.

Format:

Acceptable formats include:

- Printed photos with descriptions
- Photoblog with text (e.g. tumblr or other blog site), or
- Other – check with your TA.

components within the photo (picture quality and originality, /2; commentary /3= 5 total).

Mental Health

If you or someone you know is experiencing distress, there are several resources here at Western to assist you. Please visit the site below for more information on mental health resources:

<http://www.uwo.ca/uwocom/mentalhealth/>.

Western's commitment to accessibility- The University of Western Ontario is committed to achieving barrier free accessibility for persons studying, visiting and working at Western. Please contact the course instructor if you require material in an alternate format or if you require any other arrangements to make this course more accessible to you. You may also wish to contact Services for Students with Disabilities (SSD) at 661-2111 x 82147 or visit http://www.uwo.ca/univsec/pdf/academic_policies/appeals/accommodation_medical.pdf for any specific question regarding an accommodation.

Extra Credit - There will be absolutely no opportunity for extra credit in this course. If you are having difficulty and especially if you are fearing failing the course it is best if you come see me and/or the TA as soon as possible.

Classroom Etiquette- It is expected that you will show up to class ready and able to participate each day while remaining respectful of others in the class and their feelings and beliefs. Cell phones will be absolutely banned from use during lectures and tutorial sessions. Please turn all devices to silent or off prior to the start of class and if you are expecting a call/text that is important please notify the TA or myself prior to and we will be glad to accommodate. If you are late for class and wish to enter lecture or tutorial please do so quietly and never in the middle of a group's presentation. It is distracting to others and disrespectful to the educational goals of your classmates.