

This is the syllabus for the Public Health Impacts of Climate Change class for which I served as a Teaching Scholar for at the Mailman School of Public Health three times. Although I am not the primary instructor of this course, I have made significant contributions to the development and execution of this course. In addition to writing exam questions and designing course activities, I actually facilitated more than half of the sessions in the entire course independently.

This is a graduate level course required for students pursuing the Climate and Health Certificate. However, given the content of the course and the fact that there are no prerequisites, this course gets enrollment across the entire university. Because of the diverse student background, this course has always placed a focus on groupwork and team-based learning. This intention is clearly reflected in the course design, including group quizzes, team-based learning activities, as well as group presentations and papers.

Over the years that I have been involved with the course, students have reviewed the course very favorably, expressing content with the group work format. I am confident that these aspects can be carried over into future courses that I teach as well.

P8304
Public Health Impacts of Climate Change
2019 Syllabus

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Learning Objectives:

Students who successfully complete this course will be able to:

- Draw from the tools of climate science, epidemiology and health impact assessment in analyzing health risks from climate change
- Appreciate the value and limitations of climate modeling data for health applications
- Assess factors that enhance population vulnerability to health risks from climate
- Project health impacts of climate change into the future
- Appreciate the relevance of health assessment to climate change adaptation and mitigation planning

Teams for the Semester:

This course involves team-based learning. At the beginning of the semester, generally starting in Week 2, students will be assigned to teams composed of individuals with different skill sets.

Wednesday Lecture:

Topics will be introduced via lectures on Wednesdays. The lectures will be given by experts in the relevant disciplines, at Columbia and beyond.

Monday Assessments and Team-Based Learning:

- Monday classes will be devoted to (A) assessing students' mastery of the material covered in the previous week's lecture and readings (~30 minutes of class devoted to this) as well as (B)

team-based work related to the new topic of the week, which will be introduced in the Wednesday lecture.

- The first 10 minutes of Monday classes will be devoted to the *Individual Readiness Assurance (IRA)* quiz, which will cover last week's topic. The quiz will contain questions regarding both the readings and the lecture from the previous week. The quiz will be 10 minutes and closed book, taken Monday sessions in Weeks 2 through 11. The IRA quiz is typically composed of multiple choice, True/False, and/or fill in the blank questions. The first quiz will not count towards the grade. *Students may drop one of the subsequent quizzes from their final grade.*
- Also on Mondays, following the IRA quiz will be the *Group Readiness Assurance (GRA)* quiz. This quiz is also 10 minutes, but is taken with your team (to which you have been assigned).
- Teams will work together to discuss the material covered in last week's lecture and readings and address any difficulties with the IRA questions. After reaching consensus, the group retakes the quiz—which has identical questions as the IRA quiz, but with one additional short-answer question—and submits a group answer sheet. Immediately following the GRA will be a 10-minute class discussion session in which feedback will be provided on the IRA/GRA.
- Taken together, the IRA quiz, the GRA quiz, and the discussion session is 30 minutes of Monday class time.
- The remaining 50 minutes of Monday class is dedicated to a Team-Based Learning (TBL) exercise. The Team Based Learning Activity will be used to introduce the new topic of the week (to be covered in the Wednesday lecture). Students will be provided with a TBL handout that they should read before class.

Group Presentation and Group Final paper:

A final paper for each group (c.30 pages, double-spaced) on a specific topic will be due at end of semester. Group member contributions should be included at the end of paper, and every member should contribute to at least 8 pages. Besides, a Group presentation describing the proposed topic, result, discussion and conclusion will be due at the final student presentations.

Class Preparation:

- In the time between Wednesday and Monday, students should
 - (1) Review the lecture slides from the previous week to be prepared for the Monday *IRA* quiz, which will cover last week's topic.
 - (2) Students should read the Team Based Learning Activity handout to be prepared for class on Monday.

Final Examination. A final examination will be given to demonstrate basic mastery of the material covered in the course.

Assessment. Your course grade will be based on:

IRAs	15%
GRAs	25%
Group Presentation	20%
Paper	20%
Group peer review	5%
Final	15%

Course Outline

Week 1 Jan 23 Course Overview and Introduction to Climate Change (Micaela Martinez)

Survey for topic interest

Reading: **Pages 1-6 of:** The Lancet Commissions: "Health and Climate Change: policy responses to protect public health", The Lancet, Vol. 386, No. 10006, June 23, 2015.
<http://www.thelancet.com/commissions/climate-change-2015>

Pages 1-16 of: World Health Organization: "Quantitative risk assessment of the effects of climate change on selected causes of death, 2030s and 2050s", 2014.
<http://www.who.int/globalchange/publications/quantitative-risk-assessment/en/>

Week 2 Jan 28 Assign groups. Individual and group "mock" quiz; small group work on weather and climate.

Jan 30 Lecture: Weather and Climate (Jeffrey Shaman)

Reading: **Pages 1-29 of:** IPCC, 2013: Summary for Policymakers. In: Climate Change 2013: The Physical Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change.

Week 3 Feb 4 IRA; GRA; Small group work on climate impact modeling
Feb 6 Lecture: Climate Modeling for Impact Assessment (Daniel Bader, Center for Climate System's Research, Columbia)

Week 4 Feb 11 IRA; GRA; Small group work on Public Health Approaches
Feb 13 Lecture: Public Health Approaches (Micaela Martinez)

Groups must submit their project topic Feb 15th by 5pm

Week 5 Feb 18 NO CLASSES – Presidents' Day Holiday
Feb 20 Lecture: Climate Interactions with Air Pollution and Health (Mike He)

Week 6 Feb 25 IRA; GRA for past two lectures; Small group work on air pollution
Feb 27 Lecture: Direct Temperature Effects (Micaela Martinez)

Paper outline due Friday Mar 1st at 5pm

Week 7 Mar 4 IRA; GRA; Small group work on temperature effects
Mar 6 Lecture: Vector-borne Disease (Nicholas DeFelice, Mt Sinai)

Week 8 Mar 11 IRA; GRA; Small group work on presentations
Mar 13 Lecture: Paleoclimate and Climate Models (Linda Sohl, Columbia University)

Spring Break

Week 9 Mar 25 IRA; GRA; Small group work on presentations
Mar 27 Lecture: Epidemiology and surveillance to inform local climate adaptation strategies (Kaz Ito and Kathryn Lane, New York City Department of Health and Mental Hygiene)

Week 10 Apr 1 IRA; GRA; Small group work on climate policy options
Apr 3 Lecture: Climate policy options (Matthew Neidell, HPM Dept)

Week 11 Apr 8 Student presentations
Apr 10 Lecture: City-centered perspective on strategies for climate and health (Tom Matte, Vital Strategies)

Week 12 Apr 15 Student presentations
Apr 17 Vulnerability perspective (Daniel Carrion; PhD Student, Columbia Climate and Health Program)

Week 13 Apr 22 Small group work on final paper
Apr 24 Lecture: NGO perspective on strategies for climate and health (Kim Knowlton, Natural Resources Defense Council)

Week 14 Apr 29 Small group work on final paper
May 1 Lecture: Health consequences of food insecurity (Alexander Ruane, NASA Goddard Institute for Space Studies)

Papers due on Friday May 3rd by 5pm

Week 15 May 6 IRA on Climate Policy Options, City-Centered Perspective, Vulnerabilities, NGOs, and Food Insecurity. Review answers to quiz then work as groups to prep for final. *Group Peer Review take home assignment*
May 13 *Final Exam Given*