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**SYLLABUS**

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**Understanding and Managing the Health Risks of Climate Change****GH/ENV H 418/518 (3 credits)****Lectures Mondays/Wednesdays – 2:30–3:50 pm****Clark Hall Rm 219**

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**Instructors:**

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**Teaching assistant:**

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Thursdays 11:30 am-1:00pm, Raitt Hall Room 229, Office B

or by appointment

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**Course description**

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Climate change is likely to be an increasing public health challenge this century, and the public health workforce is not adequately prepared. The current and projected human health consequences of climate change are diverse and wide-ranging, potentially altering the burden of any health outcome sensitive to weather or climate. In some cases, the alterations may be beneficial, but in most the net impacts are expected to be adverse. Climate variability and change can affect morbidity and mortality from extreme weather and climate events, and from changes in air quality arising from changing concentrations of ozone, particulate matter, or aeroallergens. Altering weather patterns and sea level rise also may facilitate changes in the geographic range, seasonality, and incidence of selected infectious diseases in some regions, such as malaria moving into highland areas in parts of sub-Saharan Africa. Changes in water availability and agricultural productivity could affect undernutrition, particularly in parts of Asia and Africa.

Adaptation (adjustments in response to actual or expected climatic shifts) and mitigation (efforts to reduce to the likelihood of dangerous climate change by limiting greenhouse gas emissions) are the primary policy responses to address the health risks of climate change. Health adaptation can reduce the current and projected burdens of climate-sensitive health outcomes over the short term in many countries, but the extent to which it could do so past mid-century will depend on emission and development pathways. Under high emission scenarios, climate change will be rapid and extensive, leading to fundamental shifts in the burden of climate-sensitive health outcomes that will be challenging for many countries to manage. Unmanaged disease burdens could

erode gains made in public health, economic development, and living standards worldwide. Sustainable development pathways could delay but not eliminate associated health burdens.

Students in this course will gain foundational knowledge in the health effects of climate change, health benefits of mitigation activities, adaptation needs and strategies, and methods for quantifying climate change health effects and mitigation co-benefits.

### **Overall learning objectives**

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Students will be able to:

- Identify the major health risks of climate variability and change, including the sources of vulnerability to those risks
- Analyze the methods and tools for assessing risks for specified populations domestically and in several global health settings
- Enumerate key issues in implementing, monitoring, evaluating, learning from, and continuously updating, adaptation policies and programs
- Outline the health co-benefits of mitigation policies to reduce greenhouse gas emissions
- **Graduate student only** - Evaluate policy options to address the health risks of climate variability and change

### **Required readings**

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Required readings will be posted on Canvas and will include:

Intergovernmental Panel on Climate Change 5<sup>th</sup> Assessment Report *Summary for Policy Makers* (2014)  
 Smith et al. 2014 (human health chapter of the IPCC 5<sup>th</sup> Assessment Report)  
 USGCRP 2016 *The Impacts of Climate Change on Human Health in the United States*  
 Watts et al. 2015 *Lancet Commission Health and Climate Change*

In addition, students will be assigned readings from the recent literature relevant to the course content.

### **Expectations of students**

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Students are expected to prepare for and participate in class discussions, demonstrate knowledge of assigned readings, and demonstrate teamwork/professionalism. Grades for each assignment will be posted online and accessible through the course website. (see *Grades* below)

### **Grades**

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- **40%** presentations and position papers
- **60%** independent project / paper

We will use the UW's grading guidelines, available at <http://depts.washington.edu/grading/practices/guidelines.html>. Grades for each assignment will be posted on Canvas. There is no final exam.

Presentation 1: Groups of two to three students will develop a presentation and position paper (1,500 – 2,000 words excluding references) on an aspect of the national or international political context for managing the health risks of climate variability and change. Grading will be based on a clear statement of the issue(s) chosen, a description of the background and arguments to support

a particular perspective, and the group assessment of the validity and robustness of the chosen issue. The position paper and a copy of the presentation will be due January 18th at noon. The presentation and position paper will be considered in grading and all members of a group will receive the same grade.

Presentation 2: Groups of two to three students will develop a presentation and position paper (1,500 – 2,000 words excluding references) on *either* an aspect of communicating the health risks of climate change and options to manage these risks within the context of a local or national case study *or* the health co-benefits of climate change mitigation and options for pursuing mitigation by emphasizing health co-benefits within the context of a local or national case study. Grading will be based on a clear statement of the case study chosen and why, a description of how the case study is an example of best practice or an example of where communication could improve understanding or action on managing the risks of climate change, and a discussion of specific approaches to improve communication, with an evaluation of their likely effectiveness. The position paper and a copy of the presentation will be due February 6th at noon. The presentation and position paper will be considered in grading and all members of a group will receive the same grade.

Independent project (undergraduate student only): Each student will develop an individual paper on some aspect of managing the health risks of climate variability and change. This can be a subject covered by the readings or some other aspect of climate change that is of particular interest. A one-paragraph summary of the topic for the individual project will be due February 2nd at noon. The paper will be 5-10 double-spaced pages and contain a minimum of 5 references that are peer-reviewed, scholarly articles found in scientific journals. The paper will be due March 7th at noon.

Independent project (graduate student only): Each student will develop an individual paper on some aspect of managing the health risks of climate variability and change. This can be a subject covered by the readings or some other aspect of climate change that is of particular interest. A one-paragraph summary of the topic for the individual project will be due February 2nd at noon. The paper will be 10-15 double-spaced pages and contain a minimum of 10 references that are peer-reviewed, scholarly articles found in scientific journals. In addition to the added length and number of references, it is expected that this paper reflects a level of thought and analysis reflective of a graduate student. In addition, the student will give a short presentation summarizing the case study for class discussion. The paper will be due March 7th at noon.

### **UW Disability Statement**

Access and Accommodations: Your experience in this class is important to us, and it is the policy and practice of the University of Washington to create inclusive and accessible learning environments consistent with federal and state law. If you experience barriers based on a disability or temporary health condition, please seek a meeting with DRS to discuss and address them. If you already established accommodations with DRS, please communicate your approved accommodations to your instructor at your earliest convenience so we can discuss your needs.

Disability Resources for Students (DRS) offers resources and coordinates reasonable accommodations for students with disabilities and/or temporary health conditions. Reasonable accommodations are established through an interactive process between you, your instructor(s) and DRS. If you have not yet established services through DRS, but have a temporary health condition or permanent disability that requires accommodations (this can include but not limited

to; mental health, attention-related, learning, vision, hearing, physical or health impacts), you are welcome to contact DRS at 206-543-8924 or [uwdrs@uw.edu](mailto:uwdrs@uw.edu) or [disability.uw.edu](http://disability.uw.edu)

### **Academic Integrity Statement**

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Students at the University of Washington (UW) are expected to maintain the highest standards of academic conduct, professional honesty, and personal integrity. The UW School of Public Health (SPH) is committed to upholding standards of academic integrity consistent with the academic and professional communities of which it is a part. Plagiarism, cheating, and other misconduct are serious violations of the University of Washington Student Conduct Code (WAC 478-120). We expect you to know and follow the university's policies on cheating and plagiarism, and the SPH Academic Integrity Policy. Any suspected cases of academic misconduct will be handled according to University of Washington regulations. For more information, see the University of Washington Community Standards and Student Conduct website.

### **Anti-Racism Commitment**

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Instructors are committed to creating a fully inclusive climate in this class. We strive to overcome systemic racism by creating an environment that reflects community and mutual caring, while we ally with others in combating all forms of social oppression. We will look for opportunities to improve our performance as we seek to break down institutional racism. This can include course readings, class interactions, faculty performance, and/or the institutional environment. We encourage students to talk to either faculty member, or the TA, and/or submit your comments in the end-of-course evaluation form.

**Course session schedule**

<b>Class</b>	<b>Instructor</b>	<b>Topic</b>	<b>Assigned Readings</b>
<b>WEEK 1</b> (Class 1) WED 1/3	Ebi	Introduction and overview	IPCC AR5 Chap 11 <i>Human Health</i> USGCRP <i>The Impacts of Climate Change on Health in the United States: Executive Summary</i> Watts et al. 2015
<b>WEEK 2</b> (Class 2) MON 1/8	Bond	Weather, climate, climate variability, and climate change	IPCC AR5 SPM Working Group I USCRP <i>Executive Summary Climate Science Special Report</i>
<b>WEEK 2</b> (Class 3) WED 1/10	Sellers	Political context for climate science, process for international assessments, and progress toward mitigation goals	<a href="http://www.iisd.ca/climate/cop21/">http://www.iisd.ca/climate/cop21/</a> <a href="http://www.cop21.gouv.fr/en/learn/">http://www.cop21.gouv.fr/en/learn/</a> UNFCCC Paris Agreement
<b>WEEK 3</b> (Class 4) MON 1/15	No class	Martin Luther King Day	
<b>WEEK 3</b> (Class 5) WED 1/17	Ebi	Framework for understanding and managing risks; assessing current and future vulnerability and risks	Ebi et al 2006 Ebi and Villalobos 2015 McMichael & Lindgren 2011 Xun et al. 2010
<b>WEEK 4</b> (Class 6) MON 1/22	Sellers	Student presentations on political context (2-3 teams)	
<b>WEEK 4</b> (Class 7) WED 1/24	Hess	Health and risk communication	Jang_CC_Frames_Twitter 2014 Maibach_CCHH_UC_2015 Six Americas
<b>WEEK 5</b> (Class 8) MON 1/29	Hess	Methods for assessing and projecting health risks of climate change	WHO 2014: Exec Summary, Ch. 1, Ch. 8
<b>WEEK 5</b> (Class 9) WED 1/31	Hess	Thermal extremes and their health impacts	Arbuthnott et al. 2016 Bunker et al. 2016 Gasparrini et al. 2015 Hess & Ebi 2016 Sanderson et al. 2017
<b>WEEK 6</b> (Class 10)	Ebi	Extreme weather and climate events and their	Keim 2011 Schmitt et al. 2016

MON 2/5		health impacts / disaster risk management	SREX SPM 2012 Yusa et al. 2015
<b>WEEK 6</b> (Class 11) WED 2/7	Ebi	Air quality and its health impacts	D'Amato et al. 2016 Reid et al. 2016 Slovic et al. 2015 Sujaritpong et al. 2014
<b>WEEK 7</b> (Class 12) MON 2/12	Ebi	Student presentations on communication	
<b>WEEK 7</b> (Class 13) WED 2/14	Ebi	Food security	Lloyd et al. 2011 (food security) Lobell & Gourdjji 2012 (crop yields) Myers et al. 2014 (micronutrients) Wheeler & von Braun 2013 (food security)
<b>WEEK 8</b> (Class 14) MON 2/19	No class	President's Day	
<b>WEEK 8</b> (Class 15) WED 2/21	Morin	Infectious diseases	Liang and Gong 2017 Wu et al 2016
<b>WEEK 9</b> (Class 16) MON 2/26	Ebi	Public health adaptation to climate change	Bowen 2013 (governance adaptation) Ebi 2011 (adaptive management) Hess et al. 2011 (adaptive management) Hess and Ebi 2016 (early warning systems) Hess et al. 2014 (evidence based adaptation)
<b>WEEK 9</b> (Class 17) WED 2/28	Ebi	Mitigation and health co-benefits	Chang et al. 2017 Quam et al. 2017 IPCC AR5 WGIII SPM
<b>WEEK 10</b> (Class 18) MON 3/5		Student presentations of individual projects	
<b>WEEK 10</b> (Class 19) WED 3/7		Student presentations of individual projects	
		NO Final Exam	