POP HLTH / ENVIR ST 739

Climate Change and Planetary Health

Syllabus – Spring 2023 Semester

Course Dates: Jan 24 – March 31, 2022 (Spring Semester)
Meeting Time(s) and Location: Online (via Canvas), asynchronous

Credits: 2 credits
Course Designations and Attributes: Graduate Course
Pre-requisites: Graduate/Professional student standing (upper lever undergraduates with instructor permission)
Instructional Modality: Entirely Online

Course Description:
POP HLTH/ENVIR ST 739 will provide tools to identify and address real-world global environmental health issues stemming from climate change, habitat destruction leading to disease spillover events, food insecurity, and urban design.

Course Overview:
We currently face unprecedented challenges stemming from the overlap between environmental degradation, climate change, and human health on both local and global scales. The newly defined *Planetary Health* framework calls for efforts to safeguard both human health and the natural systems that underpin it. Planetary Health brings inter- and intra-generational equity issues to the forefront and pushes for integrated approaches to address the economic, social, environmental, and health impacts of increasing pressures on the planet.

It is well established that human health and wellbeing fundamentally depend on the constancy and functioning of the Earth's ecosystems and ecological services—including its oceans, forests, biogeochemical cycles, atmosphere, and levels of biodiversity. Recent evidence also demonstrates that humans are influencing Earth systems in dramatic ways; we are the strongest drivers of global environmental change. Consequently, human activity is potentially pushing the planet into a new geological epoch (some have called it 'the Anthropocene'), where unsustainable resource utilization and consumption are stressing the Earth's resilience and ability to support human life. Looming questions regarding how human society can thrive and develop in this era (while remaining within *planetary boundaries*) represent the paramount issues of our time.

This interdisciplinary course will provide students with the background and tools to identify and address real-world global environmental health issues, especially stemming from climate

change, habitat destruction leading to disease spillover events, food insecurity, and urban design. In addition to reading and discussing subject content to assist in a comprehensive understanding of key issues, students will learn skills to optimize the likelihood of affecting policy change through the systems-based frameworks of: 1) Planetary Health; and 2) Health in All Policies. Students will also be pushed to consider ethics and risk assessment in decision making. Course module sections are dedicated to teaching skills in persuasive science communication and movement building.

How Credit Hours are Met by the Course

The credit standard for this course will be met through a total of 90 hours of student engagement with the course learning activities (at least 45 hours per credit). Engagement will involve participation in 21 discrete topic sessions, organized across eight modules. Learning activites will include video lectures provided by the instructors, supplemental video and audio content, reading materials, online discussions, writing assignments, project preparation, and studying for / taking quizzes. Each module will require approximately 11.25 hours of student attention (summing to 90 hours over the entire course).

Regular and Substantive Student-Instructor Interaction

As a student in this course, you will benefit from substantitve student-instructor interaction via personalized comments on assignments, instructor and grader activity in online discussion forums, instructor posts on Canvas, virtual office hours, and optional Zoom meetings every other week.

Course Instructor:

Professor Jonathan Patz
258 Enzyme Institute
1710 University Avenue
Madison, WI 53726
Email: patz@wisc.edu
Personal Zoom:
https://uwmadison.zoom.us/j/9688564361

Availability:

Wednesdays, 12pm to 1:00pm
Or by appointment. Office hours will be conducted remotely. Students should inform me if they intend to attend office hours or wish to meet.

Instructor Email/Preferred Contact

Email is the preferred mode of contact your instructor. We will respond to emails as soon as possible. But to reduce the likelihood of missing your email, when emailing **PLEASE i**nclude "**POPHLTH 739**" in subject line to help me search is see if I missed any class emails ☺

Course Learning Objectives

By the end of the course, students should be able to:

1. Demonstrate a basic understanding of climate change science and its impacts on health
2. Recognize how policies to mitigate climate change have implications for health (in other words, solutions to the climate crisis have health implications)
3. Define each of the nine planetary boundaries and describe their links to human health
4. Define and understand the Planetary Health framework and why it is relevant today
5. Demonstrate a basic understanding of the health implications of land-use change, agriculture, the built urban environment, biodiversity loss, and water quality
6. Learn and apply risk assessment and Health in All Policies approaches to demonstrate the value of more comprehensive, cross-sector disease prevention programs
7. Synthesize a clear understanding of Planetary Health Ethics and understand the basics of movement building
8. Demonstrate and apply effective risk and science communication related to environmental health

Grading

Grading is on the A-F scale and will not be curved. Grades will be assigned on the basis of 100 points allocated for performance on Quizzes, Discussion, and Portfolio assignments. There will be three 5-point quizzes (15%) and one 10-point final quiz (10%). Completion of an asynchronous discussions will account for 28% (4 points each for all 7 discussions). Additionally, there will be three portfolio assignments, two worth 15 points, and one worth 17 points (47%). A summary of the grade breakdown is listed below.

Quizzes (3x5 points; 1x10 points) = 25%
Discussions (7x4 points) = 28%
Portfolios (2x15 points; 1x17 points) = 47%

Grades will be assigned as follows: 100-93 = A, 88-92.9 = AB, 82-87.9= B, 77-81.9= BC, 70-76.9-70= C, 60-69.9= D, and anything below 60.0 = F

Course Website, Learning Management System & Digital Instructional Tools

This course will be run exclusively on Canvas. All assignments will be submitted via Canvas. We will use Zoom for optional synchronous course meetings. It is strongly suggested that students explore and become familiar not only with Canvas' site navigation but with content and resources available for the course as soon as possible.

Required Textbook, Software & Other Course Materials

There is NO required textbook for this course. All reading materials will be provided via Canvas.

There are two optional textbooks you may want as a reference:

1. *Climate Change and Public Health.* Eds. Levy and Patz, Oxford University Press, 2015.

2. *Planetary Health: Protecting Nature to Protect Ourselves*. Eds. Myers and Frumkin, Island Press, 2020.

Discussion Sessions (remote)

We're using an asynchronous discussion format for our class to help you stay with it. Your participation in the discussions will be graded. Students will be divided into smaller online discussion groups to provide a venue for connecting with others in the class for in-depth conversations about the course topics.

Guidance about discussion topics/clear discussion prompts will be posted on Fridays for discussion to take place the following week. Students are required to contribute at least twice to the weekly online course discussion forum. The first post (due Tuesdays) should directly address the questions posed by the instructors, and it should reference/link to at least one course reading. References to other resources are also encouraged. The second post (due Thursdays) should be a critical or reinforcing (always constructive and courteous) response to the initial post of another classmate. For these two posts, student should expect to write 1-2 thoughtful paragraphs. More guidelines will be provided on Canvas. Students are encouraged to participate more than twice in the discussion forum if they would like to.

The purpose of the discussion form is three-fold. First, it allows students and instructors to interact with one another, share ideas, debate, discuss, and contemplate core topics from the course. Second, discussions will enable students to build ethical and critical thinking skills and provide opportunities for collaborative learning. Third, discussion gives students an opportunity to demonstrate that they have completed the course readings and are engaged in the materials. Each mandatory post is worth 2 points. Grading of discussion posts will be as follows: 2=excellent/good, 1= satisfactory, 0 = unsatisfactory (no post or not relevant).

Homework & Assignments

Students will be expected to complete all required readings, view all required narrated lectures and external videos, and also complete all portfolio assignments. A course calendar, including assignment due dates, will be available on Canvas.

Inside each Module on Canvas, you will see a clear list of required readings, course lectures, other videos, and links to assignment instructions and rubrics. Optional materials will also be posted in Modules and clearly labeled. All assignments, including quizzes and portfolios will be submitted via Canvas. Late submissions will not be accepted unless there are extenuating circumstances.

> **Reading** – Both required and optional reading materials will be posted on Canvas. Reading materials are important resources to supplement course lectures, videos, and other class items. Required reading material will be covered on quizzes and should be referenced in your discussion posts.
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> **Portfolios** – Throughout the class, students will be required to complete three portfolio assignments. The first two (a group project and the EnROADs simulation model project)

are worth 15 points each; the third portfolio (writing an Op-ed and accompanying "message box") is worth 17 points. Portfolio assignments will introduce tools for critical thinking and systems thinking while emphasizing either analytical or communication skills. The format for these assignments will vary, but will include short written pieces (Op-Eds, personal reflections, or critiques), use of online tools, and the creation of a Message Box to demonstrate skills in persuasive communication. One portfolio will be a group assignment, whereby students will work with a small group of peers to review a planetary health case study and create a learning module based on the case study.

Quizzes and Exams

There will be 4 online quizzes (the first three are worth 5 points each, and the final quiz is worth 10 points) throughout the class. Quizzes are open book, but timed (you'll have 45 minutes once you've opened a quiz, so you need to take it in one sitting). You'll have 75 minutes for the last quiz. Quizzes will be posted on Thursdays and must be submitted by Sunday at 11:59 pm.

Quizzes are intended to measure comprehension of core course concepts and engagement with course materials. Students who have viewed lectures, read the required reading materials, viewed additional required module content, and participated in the discussions should not have trouble answering quiz questions. Most questions will be multiple choice. The quizzes will be spaced throughout the course and will cover materials from approximately two modules each, with the exception of the final quiz, which will be comprehensive.

NOTE: There are no exams in this course.

Extra Credit

There will be opportunities for a total of 2.5 points of extra credit:

- 1 point to watch (and answer questions related to) two of Dr. Patz' 20-minute lectures on "Intro to Environmental Epidemiology" at end of Module 2 (half point extra credit for each lecture) – especially recommended for non-health science students, but open to anyone
- 1 point to make a 2-minute "Flash Talk" of your final Portfolio assignment (the Op Ed and Message Box on topic of your choice)
- ½ point for entire class if more than 80% of students complete the course evaluation

Course Module Topics*

Module 0: Welcome and Class Orientation

Part 1: Welcome!

Module 1: Disease Emergence from Ecosystem Disruption & the Planetary Boundaries

Part 1: COVID-19 Case Study in Environmental Factors
Part 2: The Anthropocene & the Nine Planetary Boundaries

Part 3: Land-use Change and Disease Emergence

Module 2: Planetary Health, Risk Assessment, & Health In All Policies

Part 1: What is Planetary Health?
Part 2: Health in all Policies
Part 3: Risk Assessment
***Optional**: Introduction to Environmental Epidemiology*

Module 3: Climate Change & Health

Part 1: Climate change and health: Heatwaves, Storms, and Worker Health
Part 2: Climate change and health: Vector- and Water-borne Diseases
Part 3: Climate change and health: Mental Health

Module 4: Clean Energy, Persuasive Science Communication, & Sustainable Behavior Change

Part 1: Climate, Air Pollution and Health - Benefits from Clean Energy Policy
Part 2: Bridging the Science–Policy Gap: Persuasive Communication Techniques
Part 3: Sustainable Behavior Change

Module 5: The Big Food Questions

Part 1: Food Production: Where We Are and Why
Part 2 Climate Change and Agriculture: a Bidirectional Relationship Impacting Food Security
Part 3: How then Shall We Eat?

Modules 6: The Built Urban Environment and Health

Part 1: Urban Planning and Health Opportunities
Part 2: Urban Sprawl Problems and Health Opportunities from Alternative Transportation

Modules 7: Water, Biodiversity, & Intensified Risks across Sectors

Part 1: Freshwater, Marine Systems, and Synergies across Land/Climate/Water Exposures
Part 2: Biosphere Integrity / Biodiversity Loss

Module 8: Ethics, Movement Building, & Course Wrap Up

Part 1: Ethics and Planetary Health
Part 2 Movement Building and the Way Forward

***Note:** Course modules were developed by Drs. Jonathan Patz and Valerie Stull. Dr. Stull is not available to participate this year but has granted permission to use her online materials.

Privacy of Student Information & Digital Tools: Teaching & Learning Analytics

The privacy and security of faculty, staff and students' personal information is a top priority for UW-Madison. The university carefully reviews and vets all campus-supported digital tools used to support teaching and learning, to help support success through learning analytics, and to

enable proctoring capabilities. UW-Madison takes necessary steps to ensure that the providers of such tools prioritize proper handling of sensitive data in alignment with FERPA, industry standards and best practices.

Under the Family Educational Rights and Privacy Act (FERPA which protects the privacy of student education records), student consent is not required for the university to share with school officials those student education records necessary for carrying out those university functions in which they have legitimate educational interest. 34 CFR 99.31(a)(1)(i)(B). FERPA specifically allows universities to designate vendors such as digital tool providers as school officials, and accordingly to share with them personally identifiable information from student education records if they perform appropriate services for the university and are subject to all applicable requirements governing the use, disclosure and protection of student data.

Privacy of Student Records & the Use of Audio Recorded Lectures
See information about privacy of student records and the usage of audio-recorded lectures. Lecture materials and recordings for this course are protected intellectual property at UW-Madison. Students in this course may use the materials and recordings for their personal use related to participation in this class. Students may also take notes solely for their personal use.

If a lecture is not already recorded, you are not authorized to record class lectures without instructor permission unless you are considered by the university to be a qualified student with a disability requiring accommodation. [Regent Policy Document 4-1] Students may not copy or have lecture materials and recordings outside of class, including posting on internet sites or selling to commercial entities. Students are also prohibited from providing or selling their personal notes to anyone else or being paid for taking notes by any person or commercial firm without the instructor's express written permission. Unauthorized use of these copyrighted lecture materials and recordings constitutes copyright infringement and may be addressed under the university's policies, UWS Chapters 14 and 17, governing student academic and non-academic misconduct.

How to Succeed in This Course
This course is a high-level, graduate survey course. Students should be active participants, motivated, and ready to think critically about big picture, global issues that impact human health and the environment. To best succeed in this course, you need to keep up. We will move quickly, and each Module has several parts. We recommend planning and preparing for each assignment in advance and getting in the habit of actively engaging in the discussion forum. Here you will be able to learn and share ideas with both your peers and the instructors. If you face any unique circumstances that might impact your performance in this course, please communicate with us as soon as possible.

Course Evaluations
Students will be provided with an opportunity to evaluate this course and your learning experience. Student participation is an integral component of this course, and your confidential feedback is important to us. We strongly encourage you to participate in the course evaluation.

We will use the online course evaluation survey tool, AEFIS. In most instances, you will receive an official email two weeks prior to the end of the class indicating when your course evaluation is available. You will receive a link to log into the course evaluation with your NetID where you can complete the evaluation and submit it, anonymously. Your participation is an integral component of this course, and your feedback is important to us. We strongly encourage you to participate in the course evaluation. If >80% participation, 0.5 point extra credit assigned to all.

Diversity & Inclusion Statement

Diversity is a source of strength, creativity, and innovation for UW-Madison. We value the contributions of each person and respect the profound ways their identity, culture, background, experience, status, abilities, and opinion enrich the university community. We commit ourselves to the pursuit of excellence in teaching, research, outreach, and diversity as inextricably linked goals. The University of Wisconsin-Madison fulfills its public mission by creating a welcoming and inclusive community for people from every background – people who as students, faculty, and staff serve Wisconsin and the world.

Academic Integrity Statement

By virtue of enrollment, each student agrees to uphold the high academic standards of the University of Wisconsin-Madison; academic misconduct is behavior that negatively impacts the integrity of the institution. Cheating, fabrication, plagiarism, unauthorized collaboration, and helping others commit these previously listed acts are examples of misconduct which may result in disciplinary action. Examples of disciplinary action include, but is not limited to, failure on the assignment/course, written reprimand, disciplinary probation, suspension, or expulsion.

Accommodations for Students with Disabilities Statement

The University of Wisconsin-Madison supports the right of all enrolled students to a full and equal educational opportunity. The Americans with Disabilities Act (ADA), Wisconsin State Statute (36.12), and UW-Madison policy (Faculty Document 1071) require that students with disabilities be reasonably accommodated in instruction and campus life. Reasonable accommodations for students with disabilities is a shared faculty and student responsibility. Students are expected to inform faculty [me] of their need for instructional accommodations by the end of the third week of the semester, or as soon as possible after a disability has been incurred or recognized. Faculty [I], will work either directly with the student [you] or in coordination with the McBurney Center to identify and provide reasonable instructional accommodations. Disability information, including instructional accommodations as part of a student's educational record, is confidential and protected under FERPA. (See: McBurney Disability Resource Center)

UW Academic Calendar & Religious Observances

See: https://secfac.wisc.edu/academic-calendar/#religious-observances