

University of Wisconsin-Madison  
*Agricultural & Applied Economics (A A E) 352*  
*Global Health: Economics, Natural Systems, and Policy*

**INSTRUCTOR**

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Office Hours: TBA

Teaching Assistant: TBA

**COURSE LOGISTICS**

<i>Lecture times</i>	three hours lecture per week (schedule TBD)
<i>Lecture meeting place</i>	TBD
<i>Discussion section times</i>	one hour discussion per week (schedule TBD)
<i>Discussion section meeting place</i>	TBD
<i>Instructional mode</i>	face-to-face only
<i>Credits</i>	4
<i>Attributes/Designations</i>	Social science; LAS Intermediate level
<i>Prerequisites</i>	Satisfied QR-A Requirement

***Credit hour determination***

Credit hours are based on the traditional Carnegie definition. For each one-hour (i.e. 50 minutes) block of classroom instruction you should expect a minimum of two hours of out of class work (i.e. reading, completing problem sets, studying, etc.) each week. Since this is a 4-credit class you should expect at least 8 hours of outside work during each of the 15 weeks of the semester. The sections that follow include more information on the out of class activities.

**COURSE DESCRIPTION**

Sustaining global health and well-being depends critically on interactions between human and natural systems at multiple spatial and temporal scales. Economics provides a useful paradigm for understanding these interactions and the pathways through which individual and societal decisions made in the face of scarce resources, and threats to the natural environment, generate health and well-being outcomes. Provides students with an opportunity to use basic economic and social science reasoning to describe global health challenges; understand the causes and consequences of health discrepancies; evaluate health and environmental policies; and appreciate the interconnectedness of planetary health and economic outcomes.

**LEARNING OUTCOMES**

Upon completion of the course students will be able to:

- Discuss the multitude of mechanisms through which human interactions with natural systems condition health and well-being outcomes in both developing and developed country contexts.
- Use positive (descriptive) economic reasoning to identify how individual and community decisions made in the face of income, political, policy, cultural, and environmental constraints lead to differential health and well-being outcomes.

- Use normative (prescriptive) economic reasoning to evaluate the efficacy of social, health, and environmental policies affecting human well-being.
- Demonstrate basic knowledge in challenge areas such air and water pollution, climate change, and fisheries depletion.

Students will also gain experience with current empirical research in economics and other fields related to planetary health.

### **CLASS FORMAT**

Most of the class time will be lecture-based, but I want to encourage your active participation. Please ask questions and respond to my queries! I will also design classroom exercises to get you actively engaged in discussing the material. Please plan to participate.

I will use a combination of handouts and board presentations. Any needed handouts will be posted by 8am the day of the lecture, so please plan to check the course website for material. More generally, I will use the class website site for posting materials and sharing information, so you should plan to interact with the site regularly.

### **DISCUSSION SECTION**

There will be a 50-minute discussion section each week, led by the TA. This time will be used for reviewing material and small group discussions.

### **TEXTBOOK**

There is no single textbook for this course. Instead, I will assign readings from a variety of sources. These will be made available to you on the course website.

### **GRADING**

Your course grade will be based on your performance on two midterm exams and one final exam, as well as quizzes and several homework assignments. The percentages are as follows:

Midterm Exams	40 percent (20 percent each)
Cumulative Final Exam	20 percent
Quizzes	15 percent
Homework Assignments	25 percent

I will determine your course grade based on the following percentages, which will arise from the numerical scores I assign to each assessment element:

$\geq 93\%$	A
$< 93\% \ \& \ \geq 88\%$	AB
$< 88\% \ \& \ \geq 83\%$	B
$< 83\% \ \& \ \geq 78\%$	BC
$< 78\% \ \& \ \geq 70\%$	C
$< 70\% \ \& \ \geq 60\%$	D
$< 59\%$	F

Note that this scale is not based on relative performance, and so grades are not based on a curve. Class attendance is not formally part of your grade. However, you will be responsible for the material discussed during lecture, much of which will be separate from the assigned readings.

### ***Exams***

Exams will include a combination of essay-style questions and analytical problems. They will be in-class and closed book. The following are the exam dates:

Midterm 1: TBD  
Midterm2: TBD  
Final Exam: TBD

If one of your midterm exams is worse than your final exam percentage, in assigning your final grade I will drop the bad midterm and increase the weight on the final exam accordingly. If you know you will miss an exam for a legitimate and previously scheduled activity, you may talk to me about taking it early. If you miss a midterm exam without prior notice I will assign a zero for your score and up-weight your final exam percentage.

### ***Quizzes***

I will use short quizzes at the start of classes to encourage you to keep up with the reading. These will be both announced and unannounced. There will be no makeup quizzes.

### ***Homework***

There will be 6 homework assignments during the semester. These will involve writing assignments and/or analytical exercises that will give you practice working with the economic models we will develop in the class. Completed homework assignments will be turned in online by the posted due date. I will not accept late assignments.

### **RULES, RIGHTS, AND RESPONSIBILITIES**

See: <https://guide.wisc.edu/undergraduate/#rulesrightsandresponsibilitiestext>

### **ACADEMIC CALENDAR AND RELIGIOUS OBSERVANCES**

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

### **ACADEMIC INTEGRITY**

By enrolling in this course, each student assumes the responsibilities of an active participant in UW-Madison's community of scholars in which everyone's academic work and behavior are held to the highest academic integrity standards. Academic misconduct compromises the integrity of the university. Cheating, fabrication, plagiarism, unauthorized collaboration, and helping others commit these acts are examples of academic misconduct, which can result in disciplinary action. This includes but is not limited to failure on the assignment/course, disciplinary probation, or suspension. Substantial or repeated cases of misconduct will be forwarded to the Office of Student Conduct & Community Standards for additional review. For more information, refer to <https://conduct.students.wisc.edu/academic-integrity/>

### **ACCOMMODATIONS OF STUDENTS WITH DISABILITIES**

#### ***McBurney Disability Resource Center syllabus 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.”  
<http://mcburney.wisc.edu/facstaffother/faculty/syllabus.php>

## **DIVERSITY AND INCLUSION**

### ***Institutional statement on diversity***

“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.” <https://diversity.wisc.edu/>

## OUTLINE OF TOPICS

### **PART I – INTRODUCTION**

#### **Week 1**

**Content** – Defining human well-being and assessing the relationship between well-being, health, and the environment

- Examine economic, human development, and health indicators of human welfare
- Examine subjective well-being indicators of human welfare
- Examine how the various measures of well-being correlate with social and environmental indicators.

#### ***Assignments***

- Pass out homework 1

#### ***Readings***

Deaton (2008), “Income, health, and well-being around the world: evidence from the Gallup World Poll,” *Journal of Economic Perspectives* 22: 53-72.

Kahneman and Krueger (2006), “Developments in the measurement of subjective well-being,” *Journal of Economic Perspectives* 20: 3-24.

Landrigan et al. (2018), “The *Lancet* commission on pollution and health,” *The Lancet Commissions* 391(10119): 462-512.

#### **Week 2**

**Content** – Quantifying the global economic burden of poor health and its distribution

- Consideration of overall determinants (medical, socio-economic, institutional, environmental) of poor health
- Understanding contributions from factors related to environmental and natural systems
- Macro-level assessment of the mechanisms linking human health/well-being and natural systems

#### ***Assignments***

- Continue work on homework 1

#### ***Readings***

Bloom and Canning (2000), “The health and wealth of nations,” *Science* 287:1207-1209.

Cutler et al. (2006), “The determinants of mortality,” *Journal of Economic Perspectives* 20: 97-210.

Lim et al. (2012), “A comparative risk assessment of burden of disease and injury attributable to 67 risk factors and risk factor clusters in 21 regions, 1990—2010: a systematic analysis for the Global Burden of Disease Study 2010.” *The Lancet* 380(9859): 2224-2260.

### **PART II – ECONOMICS TOOLKIT**

#### **Week 3**

**Content** – Economic fundamentals

- Human decision making under scarcity
- Market behavior of individuals and firms
- Analytical models of market supply, demand, equilibrium
- Defining and measuring economic costs and economic benefits

**Assignments**

- Turn in homework 1
- Pass out homework 2

**Readings**

Chapters 1, 2, and 3 from Wheelan, *Naked Economics: Undressing the Dismal Science*, 3<sup>rd</sup> edition, Norton and Company, 2019.

Chapter 4 from Mankiw, *Principles of Microeconomics*, 7<sup>th</sup> edition, Cengage, 2014.

**Week 4**

**Content** – Continue economic fundamentals

- Economic concept of an efficient outcome
- Distinction and tension between economics efficiency and equity
- Distinguishing between market and nonmarket goods
- Externalities and public goods

**Assignments**

- Continue work on homework 2

**Readings**

Mankiw, Chapter 7

Chapters 4 and 5 from Keohane and Olmstead, *Markets and the Environment*, 2<sup>nd</sup> edition, Island Press, 2016.

**Week 5**

**Content** – Health economics fundamentals

- Health and human capital production models
- Health services demand models
- Models of public health provision

**Assignments**

- Turn in homework 2
- Exam 1

**Readings**

Wheelan, chapter 6

Chapter 1, 2, and 5 from Morris et al., *Economic Analysis in Health Care*, Wiley, 2007.

Chapters 3 and 6 from Olsen, *Principles in Health Economics and Policy*, 2<sup>nd</sup> edition, Oxford University Press, 2017.

Grossman (1972), “On the concept of health capital and the demand for health,” *Journal of Political Economy* 80: 223-255.

## **Week 6**

**Content** – Environmental and health economics fundamentals

- Defensive behavior models
- Models for understanding mortality risk tradeoffs
- Human capital and the environment

**Assignments**

- Pass out homework 3

**Readings**

Pattanayak et al. (2009), “Behavior, environment, and health in developing countries: evaluation and valuation,” *Annual Review of Resource Economics* 1:183–217

Graff Zivin and Neidell (2013), “Environment, health, and human capital,” *Journal of Economic Literature* 51: 689-730.

Graff Zivin and Neidell (2014), “Pollution and health,” *Encyclopedia of Health Economics* 3: 98-102.

## **PART III – APPLICATIONS IN DEVELOPING AND DEVELOPED COUNTRY CONTEXTS**

### **Week 7**

**Content** – Health and the environment in developing countries

- Economics of indoor air pollution and respiratory health
- Economics of water quality, sanitation, and digestive health

**Assignments**

- Continue work on homework 3

**Readings**

Duflo et al. (2008), “Indoor air pollution, health, and economic well-being,” *S.A.P.I.E.N.S* 1: 7-16.

Greenstone and Hana (2014), “Environmental regulations, air and water pollution, and infant mortality in India,” *American Economic Review* 104: 3038-72.

Jueland et al. (2015), “The economics of household air pollution,” *Annual Review of Resource Economics* 7: 81-108.

Schechter et al. (2019), “Externalities and spillovers from sanitation and waste management in urban and rural neighborhoods,” *Applied Economic Perspectives and Policy*, forthcoming.

## **Week 8**

**Content** – Continue health and the environment in developing countries

- Environmental migration
- Natural resource-related violent conflict

### ***Assignments***

- Turn in homework 3
- Pass out homework 4

### ***Readings***

Cattaneo et al. (2019), “Human migration in the era of climate change,” *Review of Environmental Economics and Policy* 13: 189-206.

Deschenes and Moretti (2009), “Extreme weather events, mortality, and migration,” *Review of Economics and Statistics* 91: 659-681.

Parker (2018), “The unintended consequences of US conflict mineral regulation,” PERC Policy Series, #58.

Wigley (2017), “The resource curse and child mortality 1961-2011,” *Social Science and Medicine* 176:142-148.

## **Week 9**

**Content** – Health and the environment in developed countries

- Economics of outdoor air pollution and respiratory health
- Economic analysis of the causes and consequences of environmental injustice

### ***Assignments***

- Continue work on homework 4

### ***Readings***

Banzhaf et al. (2019), “Environmental justice: the economics of race, place, and pollution,” *Journal of Economic Perspectives* 33: 185-208.

Hsiang et al. (2019), “The distribution of environmental damages,” *Review of Environmental Economics and Policy* 13: 83-103.

Williams and Phaneuf (2019), “The morbidity costs of air pollution: evidence from spending on chronic respiratory conditions,” *Environmental and Resource Economics* 74: 571-603.

## **Week 10**

**Content** – Continue health and the environment in developed countries

- Pollution, human capital acquisition and discrepancies, and productivity

### ***Assignments***

- Turn in homework 4

- Exam 2

### **Readings**

Currie (2011), “Inequality at birth: some causes and consequences,” *American Economic Review* 101: 1-22.

Graff Zivin and Neidell (2013), “Environment, health, and human capital,” *Journal of Economic Literature* 51: 689-730.

Hill (2018), “Shale gas development and infant health: evidence from Pennsylvania,” *Journal of Health Economics* 61: 134-150.

## **PART IV – GLOBAL ENVIRONMENTAL CHALLENGES: CLIMATE AND FISHERIES**

### **Weeks 11 and 12**

**Content** – Climate change, agriculture, and nutrition

- Economics of global agricultural production
- Economics of global agricultural product demand
- Agricultural production, food demand, and climate change through the lens of economics

### **Assignments**

- Pass out homework 5

### **Readings**

Blanc and Schlenker (2017), “The use of panel models in assessments of climate impacts on agriculture,” *Review of Environmental Economics and Policy* 11: 258-279.

Brown et al. (2017), “Do markets and trade help or hurt the global food system adapt to climate change?” *Food Policy* 68: 154-159.

Hertel et al. (2016), “Predicting Long-Term Food Demand, Cropland Use, and Prices” *Annual Review of Resource Economics* 8: 417-41

Lobell et al. (2013), “The critical role of extreme heat for maize production in the United States,” *Nature Climate Change* 3: 497-501.

Mendelsohn and Massetti (2017), “The use of cross-sectional analysis to measure climate impacts on agriculture: theory and evidence,” *Review of Environmental Economics and Policy* 11: 280–298

Wang et al. (2019), “Impacts of Climate Change and Extreme Weather on US Agricultural Productivity: Evidence and Projection,” in *Agricultural productivity and producer behavior*, W. Schlenker, ed., University of Chicago Press.

### **Week 13**

**Content** – Climate change, human health, and productivity

- Models of adaptation to changing climate
- Understanding constraints on adaptation in different contexts

- Global distributional issues

### **Assignments**

- Turn in homework 5
- Pass out homework 6

### **Readings**

Anderson et al. (2019), “The critical role of markets in climate change adaptation,” *Climate Change Economics* 10: 1-17.

Barbier and Hochard (2018), “The impacts of climate change on the poor in disadvantaged regions,” *Review of Environmental Economics and Policy* 12: 26-47.

Barreca et al. (2016), “Adapting to climate change: the remarkable decline in the US temperature-mortality relationship over the twentieth century,” *Journal of Political Economy* 124: 105-59.

Grace (2017), “Considering climate in studies of fertility and reproductive health in poor countries,” *Nature Climate Change* 7: 479-485.

Hanna and Oliva (2016), “Implications of climate change for children in developing countries,” *Future of Children* 26: 115-132.

### **Weeks 14 and 15**

**Content** – Global fisheries and human well-being

- Economic analysis of overexploited fisheries
- Global demand for seafood
- Interaction between fisheries, pollution, climate, and nutrition

### **Assignments**

- Turn in homework 6

### **Readings**

Asche et al. (2018), “Three pillars of sustainability in fishers,” *Proceedings of the National Academy of Science* 115: 11221-11225.

Gaines et al. (2018), “Improved fisheries management could offset many negative effects of climate change,” *Science Advances* 4: eaao1378

Kroodsma et al. (2018), “Tracking the global footprint of fisheries,” *Science* 359: 904-908.

Smith (2012), “The new fisheries economics: incentives across many margins,” *Annual Review of Resource Economics* 4: 379-402.