

Environment and the Global Economy
(AAE/Env Studies 244)

3 Units – Face-to-Face, Traditional Lecture/Section Format

Course Website: Canvass

Tuesday and Thursdays, 11:00-12:15, 5106 Social Sciences
Office Hours – T 2:30-4:00pm; W 1:30-2:30, or by appointment.
422 Taylor Hall, bradford.barham@wisc.edu,

Teaching assistant: Nick Hudson
Office Hours – Th – 1:30-3:30 or by appointment.
312 Taylor Hall, nhudson@wisc.edu

Discussion sections: **Fridays** at following times and rooms
Section 301: 8:50-9:40, Russell Lb 150, Section 302: 9:55-10:45, Animal Science 209
Section 303: 11-11:50, Moore Hall 351, Section 304: 1:20-2:10, Nancy Nichols Hall

Course Description:

This introductory course will familiarize students the "economic way of thinking" about global and regional environmental issues. Topics include climate change, biodiversity preservation, ocean fisheries, environmental impacts of international trade, poverty and the environment, and sustainability.

Our learning outcome is as follows: students will learn the language of economics, diagnosing their source and investigating solutions.

Grading: 200 points – Close to a standard 90-100% scheme. I adjust the thresholds down a bit if necessary (e.g., 92-100 = A; 88-91.9 = AB).

Quizzes: 10@10 points = 100 pts; Problem sets: 10@5 points = 50 pts; Final: 50 pts

Important examples of the language of economics include *the law of demand*, *consumer surplus*, *economic efficiency*, *open access*, *public goods*, *technological change*, and *externality*. We will also think about how markets and politics can deliver different opportunities and challenges for the rich and the poor, the powerful and the disenfranchised, and strong and weak countries. We will examine how economists define environmental problems, and what they diagnose to be their source. We will investigate solutions, examining market-based, regulatory, and polycentric approaches. We will also entertain distinct views on controversial topics, and push one another to think and rethink the assumptions and logic of these views. This class is rooted in basic economic theory so you can expect some diagrams, algebraic equations, abstractions, and simplifications. But the purpose of the theory and mathematics is always to help us understand the real world. Economics will not provide us with “the right answer”, but it does offer useful tools and frameworks for thinking systematically about important environmental problems.

This class meets for two 75-minute class periods each week and carries the expectation that students will work on course learning activities for about 3 hours out of classroom for every class period. The syllabus includes more information about expectations for student work.

Note: *There are no economics prerequisites for this course, so I will assume that students have not had exposure to economics. The methods will be less demanding than other upper-division AAE courses, such as AAE 343, 374, or 474; it also addresses themes not covered in those courses.*

Required Text: Hawken, Paul (edited). 2017. *Drawdown: The Most Comprehensive Plan Ever Proposed to Reverse Global Warming*. Available at the book store or order on line (soon!).

Useful Texts: All of the relevant chapters are available on the course website.

Wheelan, Charles. 2010. *Naked Economics: Undressing the Dismal Science*. W.W. Norton & Company, New York. Mankiw, N. Gregory. 2007. *Principles of Economics*. South-Western. Field, Barry C. 2008. *Natural Resource Economics: An Introduction*. Waveland Press.

Supplementary Readings (on course website):

There will be several supplementary readings and podcasts. The readings will be a mix of journal articles, working papers, textbook chapters, newspaper blogs, and short essays.

Problem Sets:

There will be 10 problem sets. I will post these on Tuesdays (sometimes earlier), and give you one week to complete them. Class and discussion sections will offer opportunities to practice solving problems similar to those in the problem sets. The goal of the problem sets is to promote active engagement with the material and working together with other students is encouraged. Write up your homework in your own words. Each problem set is worth 5 points. You will earn two automatic points for attempting to answer all questions on a problem set. Then, a randomly chosen question will be graded for quality.

Quizzes:

There will be 12 quizzes, all given on Thursdays except for one on the Tuesday before spring break. You will have 12-15 minutes to complete the questions. The quizzes may contain problems and short-answer questions about assigned readings. You may be required to solve mathematical problems and interpret graphs. Quizzes build on classroom discussions and previous homework exercises. They are meant to help you identify when you are falling behind on the course content. I drop your two lowest scores, so that only your 10 best quizzes will count towards your final grade. I will not allow makeup quizzes unless there is a compelling reason. Because you can drop your lowest quiz scores, one/two absences on a quiz day will not be too consequential.

Exams: (Final Exam – Tuesday, May 7, 10:05am)

The final will build directly on the problem sets and quizzes. It will be two hours.

Procedure for Appealing Grades:

To appeal your score on a quiz or exam you should visit me during my office hours. To appeal your homework grade, please see the TA first.

Student Conduct/Academic Honesty:

Laptops are allowed, but their purpose is for taking notes (not browsing the internet, checking Facebook, twitter, etc). Cell phones, iPads, and other devices should not be out during class. All devices must be turned off and out of reach during exams and quizzes. If I catch you cheating on a quiz or exam, you will receive zero credit for the quiz, exam, or paper. I may also pursue harsher penalties through the University.

Guidelines for Doing Well in the Class:

- *Attend all classes* – quizzes, problem sets, and exams focus on material discussed in class, and some of the lecture material will not come from the readings.
- *Keep up with reading* – be “on same page” – or at least on same chapters.

• *Devote necessary time* – the typical student should devote 2-3 hours reading, doing assignments, and/or reviewing notes for each hour of class.

Schedule:

Week 1: Course Overview, Getting Started on Basic Economic Principles

Readings: Mankiw, Ch 1, Wheelan, Ch 1, Drawdown (pp. vii-xv; 216-224)

WATCH Planetary Boundaries, Sachs, Jeffrey

https://www.youtube.com/watch?v=cJYIA39UvNU&index=26&list=PLExYXELRcSgHwl28h9Oyipk_FmKd7nLby,

Math primer sections on Friday but nothing due Week 1

P Set 1 available: Tuesday, January 22 (on line), due Tuesday, January 29

Week 2: Free Markets and the Environment, Cooperation and the Environment

Readings: Mankiw, Ch 4 & 7, Peruse SR 1 (pages 641-648), Drawdown (pp. 164 and Women and Girls section)

P Set 1 due and P set 2 available: Tuesday, Jan 29

Quiz 1: Thursday, Jan 31

Week 3: Climate Change: Market Failure, Discounting, and Uncertainty

Readings: SR 2, SR 2A, Wheelan Ch 3, Drawdown (pp. 2-23: Read 3 or 4 examples including on-shore wind for sure)

P Set 2 Due and P Set 3 available: Tuesday, February 5,

Quiz 2: Thursday, February 7

Week 4: Climate Change: Incentives to Reduce Fuel Use & Technological change

Readings: Wheelan Ch 2, Mankiw Ch 5,6, SR 3, Drawdown (Transport)

P Set 3 Due and P Set 4 available: Tuesday, February 12,

Quiz 3: Thursday, February 14

Week 5: Climate Change: Government Failure and Global Coordination Challenges

Readings: Wheelan Ch 4, 8, SR 4,

P Set 4 Due and P Set 5 available: Tuesday, February 19,

Quiz 4: Thursday, February 21

Week 6: Population, Income Growth, and Environment: Malthus, Post-Malthus, Modern Growth, and Limits to Growth?

Readings: SR 5, SR 6, WATCH: Sachs, Jeffrey, Lect 3, Chs 1-3 starting from:

https://www.youtube.com/watch?v=PF_X3_gMqxo&index=11&list=PLExYXELRcSgHwl28h9Oyibipk_FmKd7nLby

P Set 5 Due and P Set 6 available: Tuesday, February 26

Quiz 5: Thursday, February 28

Week 7: Energy and Mineral Resources: Global Energy Issues and Local Curses

Readings: Drawdown (Select from Energy section) SR 7, See next page too

Watch: Sachs, Jeffrey, Lecture 6, Chapter 3

https://www.youtube.com/watch?v=dNrOxgABoA&index=28&list=PLExYXELRcSgHwl28h9Oyipk_FmKd7nLby

P Set 6 Due and P Set 7 available: Tuesday, March 5

Quiz 6: Thursday, March 7

Week 8: Food – Farm to Table (Transforming what we eat, how it's produced, and all that)

Readings: Drawdown, Food Section; SR 8, SR9

Watch: Sachs, Lecture 6, Chapter 4

https://www.youtube.com/watch?v=eDYLQ0WrNnY&index=29&list=PLExYXELRcSgHwl28h9Oyipk_FmKd7nLby

P Set 7 Due Tuesday, March 12

P Set 8 available (but not due till second week after break, April 2):

Quiz 7: Tuesday, March 12

Spring Break: March 16 – March 24

Week 9: Land Use and Deforestation: Drivers of Land Use Decisions

Readings: Drawdown (pp. 108-116; 124-127), SR 10,

Quiz 8: Thursday, March 28

Week 10: Land Use & Deforestation Cont. - Incentivizing Deforestation and/or Conservation

Readings: SR 11-15

P Set 8 – due April 2, P Set 9 available

Quiz 9: Thursday, April 4

Week 11: Global Fisheries: Regulating for Conservation, Profit, and Consumption

Readings: Field, Ch 13; SR 16

P Set 9 Due and P Set 10 available: Tuesday, April 9,

Quiz 10: Thursday, April 11

Week 12: Global Fisheries: Quotas, Cooperatives, and International Cooperation

Readings: SR 17-19

P Set 10 Due: Tuesday, April 16,

Quiz 11: Thursday, April 18

Week 13: Water Access and Conservation: The Common Pool

Readings: Field, Ch 15, SR 20-21,

Quiz 12: Thursday, April 26

Sample problems on water shared but not due as homework.

Week 14: Water Access and Conservation, plus wrap-up

Readings: SR 22, SR 23

No Quiz, Review in class on Thursday and in sections on Friday

Final Exam 10:05am Tuesday, May 7, 2019.

Supplemental Readings:

1. Ostrom, Elinor. 2010. Beyond Markets and States: Polycentric Governance of Complex Economic Systems. *American Economic Review* 100: 641–672
2. Roberts, David. 2012. Discount Rates: A Boring Thing you Should Know About. <http://grist.org/article/discount-rates-a-boring-thing-you-should-know-about-with-otters>
- 2A. Libecap, Gary D. 2014. Addressing Global Environmental Externalities: Transaction Costs Considerations. *Journal of Economic Literature* 52.2: 424-479.

3. Coady, D., Parry, I., Sears, L., Shang, B. 2017. How Large Are Global Fuel Subsidies. *World Development* 91: 11-27.
4. Ostrom, Elinor. 2014. A polycentric approach for coping with climate change. *Annals of Economic Finance* 15.1: 71-108.
5. http://www.ted.com/talks/hans_rosling_shows_the_best_stats_you_ve_ever_seen/transcript?language=en
6. Galor, Lecture 1 handout
7. Frankel, Jeffrey A. 2010. The Natural Resource Curse: A Survey. HKS Faculty Research Working Paper Series, RWP10-005.
8. Coomes, O. Barham, B., MacDonald, G., Ramankutty, N., and Chavas, J. 2019. Leveraging total factor productivity growth for sustainable and resilient farming. *Nature Sustainability* 2: 22-28.
9. **To be added.**
10. Coomes, O., Barham, B., and Takasaki, Y (2004). Targeting Conservation-Development Initiatives in Tropical Areas: Insights from Patterns of Resource Use and Reliance among Amazonian Peasants, *Ecological Economics* 51: 47-64
11. Barham, B., Callenes, M., Gitter, S., Lewis, J. and Weber, J. (2011). Fair Trade/Organic Coffee, Rural Livelihoods, and the 'Agrarian Question': Southern Mexican Coffee Farmers in Transition. *World Development*, 39, 1: 134-145.
12. Barham, B. and Weber J. (2012). The Economic Sustainability of Certified Coffee Schemes: Evidence from Mexico and Peru, *World Development*, 40(6): 1269-1279.
13. Leblois, A., Damette, O. and Wolfersberger, J. 2016. What Has Driven Deforestation in Developing Countries Since the 2000s? Evidence from New Remote-Sensing Data. *World Development* available line 2016.
14. Alston, L, Andersson, K., and Smith, S. 2013. Payment for Environmental Services: Hypotheses and Evidence. *Annual Review of Resource Economics* 5: 139-59.
15. Parker, D. and Thurman, W. 2013. Conservation Easements: Tools for Conserving and Enhancing Ecosystem Services. *Encyclopedia of Energy, Natural Resource, and Environmental Economics* 2: 133-143.
16. Gutierrez N., Valencia S., Branch T., Agnew D., Baum J.K, 2012. Eco-Label Conveys Reliable Information on Fish Stock Health to Seafood Consumers. *PLoS ONE* 7(8): e43765. doi:10.1371/journal.pone.0043765
17. Costello, C., Gaines, S., and Lynham, J. 2008. Can Catch Shares Prevent Fisheries Collapse? *Science* 321(5896): 1678-1681. Available at: <http://www.sciencemag.org/content/321/5896/1678.full>

18. Deacon, R. 2009. Creating Marine Assets: Property Rights in Ocean Fisheries. PERC Policy Series No. 43. Available at: <http://perc.org/sites/default/files/ps43.pdf>
19. Arnason, R., M. Kobayashi, and C. de Fontaubert. 2017. The Sunken Billions Revisited: Progress and Challenges in Global Marine Fisheries. *Washington DC: World Bank*. DOI: <http://dx.doi.org/10.1596/978-1-4648-0919-4>.
20. Woodhouse, P., & Muller, M. Water Governance—An Historical Perspective on Current Debates, *World Development* (2017): In press.
21. Famiglietti, J. S. (2014). The global groundwater crisis. *Nature Climate Change*, 4(11), 945-948.
22. Bauer, C. J. (2004). Results of Chilean water markets: Empirical research since 1990. *Water Resources Research*, 40(9).
23. Blackman, A., Corral, L., Lima, E. S., & Asner, G. P. (2017). Titling indigenous communities protects forests in the Peruvian Amazon. *Proceedings of the National Academy of Sciences*, 201603290.

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 studentconduct.wiscweb.wisc.edu/academic-integrity/.

Accommodations for 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 & 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/>