THE GEORGE WASHINGTON UNIVERSITY
Department of Economics
Economics of the Environment and Natural Resources, ECON 6237
Fall 2024
Thursdays, 7:10-9:00 pm, Tompkins 303

PROFESSOR: Benjamin Simon
Office Hours: 6 - 7pm, Tuesdays and Thursdays and by appointment.
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Peer Educator: TBD

TEXTBOOKS and READINGS.

Readings are divided into two categories: required and optional. All required readings will be on available via Blackboard's electronic reserves. Students will be expected to have completed the readings before the class for the relevant topic related to the reading.

- Tietenberg and Lewis, *Environmental and Natural Resource Economics*, Routledge, 11th edition, 2018. Feel free to use an older, and cheaper edition.
- Readings from Alan Randall, *Resource Economics*, 2nd ed., John Wiley, 1987 are denoted with **AR**. These readings are on Bb.

Use of Electronic Course Materials and Class Recordings—Students are encouraged to use electronic course materials, including recorded class sessions, for private personal use in connection with their academic program of study. Electronic course materials and recorded class sessions should not be shared or used for non-course related purposes unless express permission has been granted by the instructor. Students who impermissibly share any electronic course materials are subject to discipline under the Student Code of Conduct. Please contact the instructor if you have questions regarding what constitutes permissible or impermissible use of electronic course materials and/or recorded class sessions. Please contact Disability Support Services at disabilitysupport.gwu.edu if you have questions or need assistance in accessing electronic course materials.

REQUIREMENTS AND GRADING.

Problem sets. There are eight problem sets. Several of the problem sets require using Excel (or statistical software of your choosing). The math review assignment is designed to review relevant math concepts and *will not be graded*.

- The problem sets will be posted on Blackboard in the "problem set" area. These assignments may be done in groups if you choose.
- ***Please turn in hard copies of your assignment on the due date***. There may be some situations where assignments are to be turned in online. I will let you know about this if necessary.
- Late assignments will only be accepted with the permission of the instructor.

Turning in assignments. Homework assignments are due in hard copy at the beginning of class unless otherwise indicated on Bb or in class.

Submission of Written Work Products Outside of the Classroom. It is your responsibility to ensure that I receive your assignment on time. It is not permissible to submit assignments electronically or through Blackboard unless I tell you so.

Collaboration on Assignments. You are encouraged to work in groups; however, you are expected to write-up your answers individually.

Late work will not be graded (unless an exception has been granted prior to the due date).

Tests. There is a midterm and a final exam. The midterm will be a take home exam; the final will be an in-class exam. **Quizzes**. There are eight quizzes. The quizzes are generally short and focused on the readings. All quizzes are on Bb and should be completed prior the class meeting when they are due.

Class participation. Classroom participation is strongly encouraged.

Grading. The course grade will be calculated using the following weights: midterm exam -- 25%; final exam -- 30%; quizzes – 10%; homework assignments – 30%; class participation -- 5%. I expect that you will come to class having read the assigned readings and prepared to engage with me and other students in discussing the material we are covering; class participation is more than just attendance.

- A (Excellent): Exceptional work for a graduate student. Shows a solid command of the material.
- (Very Good): Very strong work for a graduate student. Shows signs of a solid understanding of appropriate analytical approaches and meets professional standards.
- B+ (Good): Sound work for a graduate student. This grade indicates the student has fully accomplished the basic course objectives.
- B (Adequate): Competent work for a graduate student with some evident weaknesses. Demonstrates competency in the key course objectives but the understanding or application of some important issues is less than complete.
- (Inadequate): Weak work for a graduate student. Understanding of key issues is incomplete.

Late or Missed Class. If you are late or absent from class, it is your responsibility to obtain all announcements, assignments, and handouts from Blackboard or from your classmates.

Exam Dates. Please notify me in the first two weeks of class if you are aware of a pre-existing conflict, such as a religious holiday you observe, that will preclude you from taking either the midterm or final at the assigned time. To the extent possible, we will work together to reschedule the exam as close to the original date as possible.

Incompletes. You must consult with me to obtain an incomplete no later than the last day of classes in the semester. At that time, we will both sign the CCAS contract for incompletes and submit a copy to the School Director.

Changing Grades After Completion of Course. No changes can be made in grades after the conclusion of the semester, other than in cases of clerical error.

Technology. This class will take place in-person unless unforeseen personal circumstances or

university rules require me to teach online. However, office hours or other meetings may take place. Class meetings will also be recorded and available on Bb after class. Therefore, please ensure that you have the required technology to fully participate in the course. Ideally, you should be able to:

Accommodation for Students with Disabilities. If you need extra time on exams or assignments due to a disability, let me know in the first week of class. Receiving accommodations on the basis of disability, requires proper documentation from the Office of Disability Support Services, Marvin Center 436, 202-994-8250. Accommodations will be made based upon the recommendations of the DSS Office.

University Counseling Center. The University Counseling Center (UCC), 202-994-5300, offers 24/7 assistance and referral to address students' personal, social, career, and study skills problems. Services available for students include: crisis and emergency mental health consultations; confidential assessment, counseling services (individual and small group), and referrals

Religious Holidays. If you need to miss a class to observe a religious holiday, please notify me the first week of classes about any conflict; we will arrange an absence without penalty.

Academic Integrity. The George Washington University is guided by the standards of academic integrity. Students are reminded to honor the Code of Academic Integrity, which can be viewed at:

http://www.gwu.edu/~ntegrity/code.html

If you are not familiar with the Code, you should read through it carefully.

Topics, Readings, and Assignment Due Dates

Week number and date	**Topic**	***Due in class in hard copy unless otherwise noted***	**Read before class:**
Week 1 - 8/22	Course logistics; micro review/welfare econ; excel	• Quiz 1 - micro review; see Bb course content	1. AR, Chapter 5. [*Note: this material is quite technical; just read and try and get the general ideas*] 2. Fullerton, Don, and Stavins, R. 1998. "How Economists See the Environment," Nature, Vol. 395, October. 3. Read: Should we protect nature for its own sake? 4. Read: Preservation v. development 5. Watch: cost of air pollution
Week 2 - 8/29 – ***No Class***	Environmental justice	• Review the ppts posted to Bb • Quiz 2 • Problem set 1: supply and demand. Upload your answers to Bb.	1. Tietenberg and Lewis, Chapter 19; discounting on pp 49-51 and 60-64. 2. Banzhaf, S, et. al, 2019. *Environmental Justice: the economics of race, place and pollution*. Journal of Economic Perspectives, Vol 33, No. 3. Ando, A.W., et al., 2024. Environmental and Natural Resource Economics and Systemic Racism, *Review of Environmental Economics and Policy*, volume 18, number 1, winter. 4. Pastor, M., et al, 2001. *Which came first? Toxic Facilities, Minority Move-in, and Environmental Justice*. Journal of Urban Affairs, Vol 23, No. 1. 5. Read: https://energyathaas.wordpress.com/2021/03/29/environmental-markets-and-environmental-justice/ 6. Read: Pollution 7. Read: section 10, pp. 61-66, Draft Circular A-4 8. Listen: The economics of environmental justice 9. Listen: Building a movement (this is a nice podcast that explains how the EJ movement got started).
***Optional* session**— Sunday, 9/1, noon - 1pm; in person/virtual; Location TBD	Micro; Excel; regression review	Regression review material: see Bb week 1 course content. There are also lots of resources on the web, such as: regression	

Week number and date	**Topic**	***Due in class in hard copy unless otherwise noted***	**Read before class:**
Week 3 -- 9/5	Property rights/mkt failure, government failure	• Problem set 2 - EJ • Quiz 3: EJ quiz	1. Tietenberg and Lewis, Chapter 2 2. Farrell, Joseph. *Information and the Coase Theorem*. Journal of Economic Perspectives. Vol 1, No. 2, Fall 1987, pp. 113-129. 3. Read: Coase Theorem 4. Read: When one almond gulps 3.2 gallons of water 5. Watch: When one almond gulps water • 2003 Coase Lecture by Ronald Coase - Part 1/6 - YouTube (6 parts, no need to watch all; part 1 is enough!)) • Enforcement of property rights: John Dutton Confronts Bikers | Yellowstone - YouTube 6. Ostrom, E., et al., 1999. *Revisiting the Commons: Local Lessons, Global Challenges*. Science, Vol 284, No. 5412. 7. Winston, C., 2006. Government Failure versus Market Failure. AEI-Brookings Joint Center for Regulatory Studies, chapters 1, 2 and 4. 8. Listen to this podcast: Freakonomics radio—economics of saving the Amazon 9. ***Optional***: Daniel H. Cole, Pollution and Property: The Conceptual Framework, Chapter 1 in Pollution and Property, Cambridge University Press 2002. 10. ***Optional***: Davis, Lucas, 2013. The Economic Cost of Global Fuel Subsidies. Energy Institute at Haas (EI @ Haas) Working Paper 247. December. Available online at: https://ei.haas.berkeley.edu/research/working-papers.html. 11. ***Optional***: Do Markets Work for Bees? http://conversableeconomist.blogspot.com/2014/07/do-markets-work-for-bees.html; and Colony collapse disorder: The market response to bee Disease, https://perc.org/sites/default/files/ps50.pdf
***Optional* session**— Sunday, 9/8, noon - 1pm; in person/virtual; Location TBD	Micro; Excel; regression review	• Regression review material: see Bb week 1 course content. • There are also lots of resources on the web, such as: regression	
Week 4 -- 9/12	Property rights/market failure, government failure; intro to travel cost model	• Problem set 3: public goods • Quiz 4	
Week 5 -- 9/19	Property rights/mkt failure, government failure; into to travel cost method		
Week 6 -- 9/26	Benefit cost analysis	• Problem set 4: travel cost method • Listen to this podcast! The spreadsheet of life and death	1. Tietenberg and Lewis, Chapters 3, 4 2. Dudley, S, et al. 2017. *Consumer's Guide to Regulatory Impact Analysis: Ten Tips for Being an Informed Policy Maker*. J. Benefit Cost Anal. 1-18. 3. Loomis, John B., and Rosenberger, Randall S. 2006. "*Reducing barriers in future benefit transfers: Needed improvements in primary study design and reporting*." Ecological Economics, Vol. 60, pp. 343-350. 4. Aldy, Joseph, et al., 2020. *Deep Flaws in a mercury regulatory analysis*. Science, Vol 368, Number 6488.
Week 7 -- 10/3	Benefit cost analysis	**Mid-term distributed**	

Week number and date	Topic	*Due in class in hard copy unless otherwise noted*	Read before class:
			5. Hanley, N and Czajkowski, M., 2019. *The Role of Stated Preference Valuation Methods in Understanding Choices and Informing Policy*. Review of Environmental Economics and Policy. 6. Listen to this podcast! The spreadsheet of life and death 7. ***Optional***: Bishop, R. et al. 2017. Putting a value on injuries to natural assets: the BP oil Spill, Science, April 21, Vol 356, issue 6335. 8. ***Optional***: Herman Leonard and Richard Zeckhauser, *Cost-Benefit Analysis Defended*, Report from the Center for Philosophy and Public Policy, University of Maryland at College Park, Vol. 3, No. 3 (Summer 1983), pp. 6-9. Reprinted in The Environmental Ethics and Policy Book, 3rd ed. (D. VanDeVeer and C. Pierce, eds.), Wadsworth, 2003.
Fall Break 10/10, 10/11			
Week 8 -- 10/17	Instruments for pollution control	• Quiz 5	1. Tietenberg and Lewis, Chapters 14, 15, and 16 2. Goulder, Lawrence, and Parry, Ian W.H., 2008. Instrument Choice in Environmental Policy, Review of Environmental Economics and Policy, pp. 1-24, July. 3. Robert S. Pindyck, 2007. Uncertainty in Environmental Economics. Review of Environmental Economics and Policy, Vol. 1, issue 1, winter, pp 45-65. 4. ***Optional***: Ribaudo, M., 2017. Conservation Programs Can Accomplish More with Less by Improving Cost-Effectiveness. Volume 32, No. 4. 5. ***Optional:*** Schmalensee R. and Stavins, R. 2017. Lessons Learned from Three Decades of Experience with Cap and Trade. Review of Environmental Economics and Policy. Volume 11, Issue 1, Winter, Pages 59–79. 6. ***Optional:*** Karen Fisher-Vanden and Sheila Olmstead. 2013. "Moving Pollution Trading from Air to Water: Potential, Problems, and Prognosis." Journal of Economic Perspectives. Volume 27, Number 1. Pages 147–172. 7. ***Optional***: climate change Econofact. A very nice set of materials on various aspects of climate change.
Week 9 -- 10/24	Instruments for pollution control	• Problem set 5: efficient allocation of pollution	
Week 31 – 11/2	Enforcement/monitoring; VSL; climate change	• Quiz 6: Use the discount rate simulation to answer the discounting quiz questions	1. Tietenberg and Lewis, Chapter 17 2. Newell, Richard G., Pizer, William A., Raimi, Daniel. 2014. *Carbon Market Lessons and Global Policy Outlook*. Science, 21 March, Vol 343, p. 1316. 3. Social cost of GHGs

Week number and date	**Topic**	***Due in class in hard copy unless otherwise noted***	**Read before class:**
Week 11 --11/7	Climate change	• Quiz 7: climate change	4. Stavins, R. 2019. *The Future of US Carbon Pricing Policy*. Prepared for NBER. Available online at: future of carbon pricing 5. Pindyck, R. 2013. *Climate Change Policy: What Do the Models Tell Us?* Journal of Economic Literature, September, Vol. 51, No. 3, pp. 860-872. 6. Listen: Nordhaus talk on climate change 7. Listen: Carbon tax! 8. Check out: this cool visualization of carbon emissions 9. Read: European ETS system allowance prices
Week 12 -- 11/14	Exhaustible resources	• Problem set 6: Hedonics	1. Tietenberg and Lewis, Chapters 5 and 6 2. Hamilton, James. 2011. "Oil Prices, Exhaustible Resources, and Economic Growth," Pp 1-17. 3. Covert, T., et al. 2016. Will We Ever Stop Using Fossil Fuels? *Journal of Economic Perspectives*, Vol. 30, no. 1, pp 117-138. 4. **Optiona**l: Krautkraemer, Jeffery A. 2005. Economics of Natural Resource Scarcity: The State of the Debate. April 2005 Resources for the Future Discussion Paper 05–14. Available online at: http://www.rff.org/rff/documents/rff-dp-05-14.pdf. 5. ***Optional***: Oli Tahvonen, A. Economic Sustainability and Scarcity of Natural Resources: A Brief Historical Review, Resources for the Future, June 2000. On Bb and available online at: http://www.rff.org/Documents/RFF-IB-00-tahvonen.pdf.
Week 13 -- 11/21	Exhaustible and renewable resources	• Problem set 7: municipal water block rate pricing • Check out these podcasts on water: ○ Water is cheap ○ Liquid markets ○ Lawns in Las Vegas ○ Parched	1. Tietenberg and Lewis, Chapters 9 and 11 2. Leonard, B, et.al, 2019. Expanding Water Markets in the Western United States: Barriers and Lessons from Other Natural Resource Markets. Review of *Environmental Economics and Policy*, Vol. 13, no. 1. 3. Schwabe, K., et al. 2020 Water Markets in the Western U.S.: Trends and Opportunities. *Water*, 12(1), 233. Available on Bb and at water markets in the wester US 4. Edwards, E. and Sutherland S., 2019. *A Guide to Municipal Water Conservation Pricing in Utah*. Utah State University, 2019-01. 5. ***Optional***: Carl Bauer, Marketing Water, Marketing Reform, Resources, Resources for the Future, Summer 2003. Available online at: www.rff.org/rff/Publications/Resource_Articles.cfm

Week number and date	Topic	*Due in class in hard copy unless otherwise noted*	Read before class:
			6. ***Optional***: Olmstead, Sheila M. and Stavins, Robert N. 2009. Comparing price and nonprice approaches to urban water conservation. Water Resources Research, Vol 45 W04301. 7. ***Optional***: Olmstead, Shelia M. 2010. The Economics of Managing Scarce Water Resources. Review of Environmental Economics and Policy Advance Access published June 24, 2010.
Thanksgiving Break – Monday 11/25 – Saturday 11/30			
Week 14 -- 12/5	Exhaustible and renewable resources	• Quiz 8 • Problem set 8: Exhaustible resources	
Week 15 -- 12/10 (potential make-up class)	Ecosystem services		1. Tietenberg and Lewis, Chapter 13 2. Dasgupta, P. 2023. The economics of biodiversity. Resources, no. 212, Spring 2023. 3. Proposed Changes Would Increase the Cost and Decrease the Benefit of Listing Species as Endangered, Choices, 2019 4. Langpap, Christian, et at. 2017. The Economics of the U.S. Endangered Species Act: A Review of Recent Developments. *Review of Environmental Economics and Policy*, pp. 1–23.
12/?		**Final Exam**	