

Economics 377 (L01) (Economics and the Environment)

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Lecture Location: [ST 131](#)
Lecture Days/Time: TR 14:00 - 15:15

Office: ZOOM Delivery
Office Hours: R 15:30 – 16:30

Winter 2022

Course Description:

This course examines the links between economic activity and environmental degradation. Topics include the valuation of environmental amenities, the use of incentives in regulation, the economics and environmental effects of market failure and the rationale for government intervention.

Course Learning Outcomes:

At the end of the semester, students will be able to:

- i. Define and apply key terms in environmental and natural resource economics and policy
- ii. Explain how markets the benefits and limitations of markets in managing the environment
- iii. Discuss, evaluate, and compare key policy tools to efficiently manage pollution
- iv. Explain several revealed and stated preference non-market valuation techniques
- v. Discuss and distinguish types of value from the environment
- vi. Discuss non-efficiency objectives in environmental management
- vii. Assess the distribution of costs and benefits of environmental policy across society

Tentative Course Outline:

Math Review; Markets and Externalities

***Keohane & Olmstead Chapters 1 and 2

***Fullerton, Don and Robert Stavins (1998), "How economists see the environment," *Nature* 395(October): 433-434.

Arrow, Kenneth, et al. 1996. Is there a role for benefit-cost analysis in environmental, health, and safety regulation? *Science*, 12 April.

Coase and the Market Solution

***Keohane & Olmstead Chapters 4 and 5 and pages 125-129 (in first edition)/pages 139-143 (in second edition).

Coase, R. 1960. "The Problem of Social Cost" *Journal of Law and Economics* 3: 1-44.

Estimating the Demand for Environmental and Resource Amenities: Taxonomy of Value and Stated Preference Valuation

***Keohane & Olmstead Chapter 3

National Center for Environmental Economics, U.S. Environmental Protection Agency. 2010. Guidelines for Preparing Economic Analyses, Chapter 7 "Analyzing Benefits". See: <https://www.epa.gov/sites/default/files/2017-09/documents/ee-0568-07.pdf>.

Bockstael, Nancy E., A. Myrick Freeman, Raymond J. Kopp, Paul R. Portney and V. Kerry Smith (2000), "On Measuring Economic Values for Nature," *Environmental Science and Technology* 34: 1384-1389.

Arrow and Solow. "Report of the NOAA panel on contingent valuation." (1993): 4601-4614.

Carson, Richard T. (2000), "Contingent Valuation: A User's Guide," *Environmental Science and Technology* 34: 1413-1418.

Carson, R and Mitchell, R. 1993. "The Value of Clean Water: The Public's Willingness to Pay for Boatable, Fishable, and Swimmable Quality Water," *Water Resources Research*, 29: 2445-54.

Carson, Richard T., Robert C. Mitchell, Michael Hanemann, Raymond J. Kopp, Stanley Presser and Paul A. Ruud (2003), "Contingent Valuation and Lost Passive Use: Damages from the Exxon Valdez Oil Spill." *Environment and Resource Economics* 25: 257-286.

Diamond, P. A., & Hausman, J. A. (1993). On contingent valuation measurement of nonuse values. *Contingent valuation: A critical assessment*, 3-38.

Diamond, P. A., & Hausman, J. A. (1994). Contingent valuation: Is some number better than no number?. *The Journal of economic perspectives*, 45-64.

Kotchen, M. J. and S. D. Reiling, "Estimating and Questioning Economic Values for Endangered Species: An Application and Discussion," *Endangered Species Update*, 1998.

Estimating the Demand for Environmental and Resource Amenities: Revealed Preference Valuation

***Section 2.1 of Mendelsohn, Robert, and Sheila Olmstead. "The economic valuation of environmental amenities and disamenities: methods and applications." *Annual Review of Environment and Resources* 34 (2009): 325-347.

Bishop, K.C., Kuminoff, N.V., Banzhaf, H.S., Boyle, K.J., von Gravenitz, K., Pope, J.C., Smith, V.K. and Timmins, C.D., 2020. Best practices for using hedonic property value models to measure willingness to pay for environmental quality. *Review of Environmental Economics and Policy*, 14(2), pp.260-281.

Evans, M.F. and Taylor, L.O., 2020. Using revealed preference methods to estimate the value of reduced mortality risk: Best practice recommendations for the hedonic wage model. *Review of Environmental Economics and Policy*, 14(2), pp.282-301.

Muehlenbachs, L., Spiller, E. and Timmins, C., 2015. The housing market impacts of shale gas development. *American Economic Review*, 105(12), pp.3633-59.

Carr, L. and R. Mendelsohn. 2003. "Valuing Coral Reefs: A Travel Cost Analysis of the Great Barrier Reef" *Ambio* 32: 353-357.

U.S. Environmental Protection Agency. 2010. "Valuing Mortality Risk Reductions for Environmental Policy: A White Paper." Draft Paper.

Estimating Costs of Environmental Regulation

Pasurka, Carl. 2008. Perspectives on pollution abatement and competitiveness: theory, data, and analyses. *Review of Environmental Economics and Policy* 2: 194-218.

Porter, Michael E., and Claas van der Linde. 1995. Toward a new conception of the environment-competitiveness relationship. *Journal of Economic Perspectives* 9: 97-118.

Palmer, Karen, Wallace E. Oates, and Paul R. Portney. 1995. Tightening environmental standards: the benefit-cost or no-cost paradigm? *Journal of Economic Perspectives* 9: 119-132.

Policy Tools: Direct and Indirect Taxes and Subsidies

*** Keohane & Olmstead Chapters 8 and 9

Olmstead, Sheila, and Jiameng Zheng. "Water Pollution Control in Developing Countries: Policy Instruments and Empirical Evidence." *Review of Environmental Economics and Policy* 15, no. 2 (2021): 261-280.

Kotchen, M.J. and Segerson, K., 2020. The use of group-level approaches to environmental and natural resource policy. *Review of Environmental Economics and Policy*, 14(2), pp.173-193.

Policy Tools: Tradable Pollution Permits

*** Keohane & Olmstead Chapter 10

Joskow, P., R. Schmalensee, E. Bailey. 1998. "The Market for Sulfur Dioxide Emissions" *American Economics Review* 88: 669-685.

Muller, N. and R. Mendelsohn. 2009. "Efficient Pollution Regulation: Getting the Prices Right" *American Economic Review* 99: 1714-1739.

Tietenberg, T. 1980. "Transferable Discharge Permits and the Control of Stationary Source Air Pollution" *Land Economics* 5: 391-416.

Goulder, Lawrence H., and Ian W. H. Parry. 2008. Instrument choice in environmental policy. *Review of Environmental Economics and Policy* 2: 152-174.

Keohane, Nathaniel O. 2003. Cost savings from allowance trading in the 1990 Clean Air Act: estimates from a choice-based model. In: Freeman and Kolstad, eds., *Moving to Markets in Environmental Regulation: Lessons from Twenty Years of Experience*. New York: Oxford, pp. 194-229.

Fowlie, Meredith, and Nicholas Muller. 2013. Market-based emissions regulation when damages vary across sources: What are the gains from differentiation? NBER Working Paper No. 18801.

Decentralized Approaches (Information, Voluntary Compliance, and Liability)

Hamilton (1995), "Pollution as News: Media and Stock Market Reactions to TRI Data." *Journal of Environmental Economics and Management*. 28:98-113.

Arora and Cason (1995). "An Experiment in Voluntary Environmental Regulation: Participation in EPA's 33/50 Program." *Journal of Environmental Economics and Management*. 28:271-286.

Richardson. "US Oil Spill Law." RFF Policy Backgrounder.

Climate Change

Mendelsohn, R., A. Dinar, and L. Williams. 2006. "The Distributional Impact of Climate Change On Rich and Poor Countries" *Environment and Development Economics* 11: 1-20.

Nordhaus, W. D. 1991. 'To Slow or Not to Slow: The Economics of the Greenhouse Effect' *Economic Journal* 101: 920-937.

Nordhaus, William. 2007. Critical assumptions in the Stern Review on Climate Change. *Science* 317(5835): 201-202.

Stern, Nicholas, and Chris Taylor. 2007. Climate change: risk, ethics, and the Stern Review. *Science* 317(5835): 203-204.

Aldy, Joseph E., Alan J. Krupnick, Richard G. Newell, Ian W.H. Parry, and William A. Pizer. 2010. Designing climate mitigation policy. *Journal of Economic Literature* 48(4): 903-934.

Heal, G. "Climate Economics: A Meta-Review and Some Suggestions for Future Research," *Review of Environmental Economics and Policy*, 2009.

Krugman, P. "Building a Green Economy," *New York Times Magazine*, April 7, 2010.

NOAA, "Restoration Economics: Discounting and Time Preference."

Pacala, S. and R. Socolow. 2004. "Stabilization Wedges: Solving the Climate Problem for the Next 50 Years with Current Technology" *Science* 305: 968-972.

Seo, N. and R. Mendelsohn. 2008. "A Ricardian Analysis of the Impact of Climate Change on South American Farms" *Chilean Journal of Agricultural Research* 68: 69-79.

Stavins, R. "The Real Options for U.S. Climate Policy," June 23, 2010.

Stavins, R. "Beware of Scorched-Earth Strategies in Climate Debates," July 27, 2010.

Weyant, J. 2000. *An Introduction to the Economics of Climate Change* Pew Center on Global Climate Change, Arlington.

Newell, Richard G., and William A. Pizer. "Discounting the distant future: how much do uncertain rates increase valuations?." *Journal of environmental economics and management* 46, no. 1 (2003): 52-71.

Integrated Assessment Models

***Carleton, Tamma, and Michael Greenstone. "Updating the United States government's social cost of carbon." University of Chicago, Becker Friedman Institute for Economics Working Paper 2021-04 (2021).

Muller and Mendelsohn. 2007. "Measuring The Aggregate Damages of Air Pollution in the United States" *Journal of Environmental Economics and Management* 54: 1-14.

Rowe, Robert, Ralph D'Arge and David Brookshire. 1980. "An Experiment on the Economic Value of Visibility." *Journal of Environmental Economics and Management*. 7: 1-19.

Forests and Non-Timber Forest Products

***Keohane & Olmstead , Chapter 7

***Druckenmiller, Hannah, "Estimating an Economic and Social Value for Healthy Forests: Evidence from Tree Mortality in the American West"

Field, B. Chapter 12: Forest Economics, in *Natural Resource Economics*, 2001.

Fisher, B., S. Polasky, and T. Sterner, "Conservation and Human Welfare: Economic Analysis of Ecosystem Services," *Environmental and Resource Economics* 48(2), 2011.

Polasky, S., E. Nelson, J. Camm, B. Csuti, P. Fackler, E. Lonsdorf, C. Montgomery, D. White, J. Arthur, Jeff; B. Garber-Yonts, R. Haight, J. Kagan, A. Starfield, C. Tobalske. 2008. "Where to put things? Spatial land management to sustain biodiversity and economic returns" *Biological Conservation*, v.141, June 2008, pp.1505-1524, 2008.

Rosser, B. 2003 "Complexities of Dynamic Forest Management" James Madison University.

Species Preservation and Biodiversity

Epanchin-Niell, R., McAusland, C., Liebhold, A., Mwebaze, P. and Springborn, M.R., 2021. Biological invasions and international trade: Managing a moving target. *Review of Environmental Economics and Policy*, 15(1), pp.180-190.

Westwood, Alana R., et al. "Protecting biodiversity in British Columbia: Recommendations for developing species at risk legislation." (2019): 136-160.

Ferris, A.E. and Frank, E.G., 2021. Labor market impacts of land protection: The Northern Spotted Owl. *Journal of Environmental Economics and Management*, p.102480.

Metrick, Andrew and Martin L. Weitzman. 1998. Conflicts and choices in biodiversity preservation. *Journal of Economic Perspectives* 12(3): 21-34.

Simpson, David R. 1997. Biodiversity prospecting: shopping the wilds is not the key to conservation. *Resources* 126 (Winter).

Langpap, Christian, and Joe Kerkvliet. 2012. Endangered species conservation on private land: Assessing the effectiveness of habitat conservation plans. *Journal of Environmental Economics and Management* 64(1): 1-15.

Natural Disasters

***Kousky, C. (2014). Informing climate adaptation: A review of the economic costs of natural disasters. *Energy economics*, 46, 576-592.

***Kousky, C. (2019). The role of natural disaster insurance in recovery and risk reduction. *Annual Review of Resource Economics*, 11, 399-418.

Michel-Kerjan, E. O. (2010). Catastrophe economics: the national flood insurance program. *Journal of economic perspectives*, 24(4), 165-86.

Bakkensen, L. A., & Ma, L. (2020). Sorting over flood risk and implications for policy reform. *Journal of Environmental Economics and Management*, 104, 102362.

Cavallo, Eduardo, and Ilan Noy. "Natural disasters and the economy—a survey." *International Review of Environmental and Resource Economics* 5, no. 1 (2011): 63-102.

Mendelsohn, R., Emanuel, K., Chonabayashi, S., & Bakkensen, L. (2012). The impact of climate change on global tropical cyclone damage. *Nature Climate Change*, 2(3), 205-209.

Prerequisites/corequisites:

Economics 201.

Required Textbook(s):

Keohane and Olmstead, Markets and the Environment (Second edition is available at the [bookstore](#) and online at the [library](#); First edition has the same chapter order).

Recommended Textbook(s):

Field and Field, Environmental Economics an Introduction (Physical copy on reserve at the library)

Books on Reserve:

Field and Field, Environmental Economics an Introduction (Physical copy on reserve at the library)

Desire2Learn:

This course will make use of the Desire2Learn (D2L) platform. Students who are registered in the course can log on at <http://d2l.ucalgary.ca> through their student centre. Please note that D2L features a class e-mail list that may be used to distribute course-related information. These e-mails go to your University of Calgary e-mail addresses only.

Grade Determination and Final Examination Details:

MIDTERM EXAM (FEB 17)	30%
ASSIGNMENTS (best 5 of 6)	25%
CLASS PARTICIPATION	5%
FINAL EXAMINATION	<u>40%</u>
	100%

The official grading system will be used. See <http://www.ucalgary.ca/pubs/calendar/current/f-1-1.html>.

A passing grade on minimum of 40% of the course work is required for a student to pass the course as a whole.

If a student's letter grade on the final exam exceeds their midterm(s) letter grade, the weight of the midterm(s) is (are) transferred to the final exam at the discretion of the instructor. The student must have written the midterm(s) or provided supporting documentation for the absence(s) such as a medical note or statutory declaration.

As per the Writing Across the Curriculum Statement in the Calendar, writing and grading thereof will be a factor in the evaluation of student work. See <https://www.ucalgary.ca/pubs/calendar/current/e-2.html>.

Course material dealing with a particular assignment will typically be covered in class at least 5 days before the assignment is due; thus, assignments can be completed at any time up to and including the due date. Given these factors, only situations where someone can document illness or domestic affliction for an extended period (i.e., the entire 5 days prior to the due date) would possibly warrant shifting the assignment weight to the final exam. Furthermore, technical problems can be expected to

occur with computer systems (and internet availability) so it may be a good idea to not wait until the last minute to submit your assignment.

Any student work which remains undistributed after the last day of classes will be available to students through the instructor's office during the instructor's office hours.

The final examination will be comprehensive, scheduled by the Registrar, held in a classroom, and last 2 hours. If a student cannot write their final exam on the date assigned by the Registrar's Office, they need to apply for a deferred exam <https://www.ucalgary.ca/pubs/calendar/current/g-6.html>. Under no circumstance will this be accommodated by the Department.

The in-class midterm will be held on February 17. This timed assessment will be available via D2L quiz at the beginning of class on February 17 at 2PM and will be available for 24 hours. When you access the assessment, you will have the length of the class [i.e., 75 minutes] to complete and submit it. This assessment will consist of written and multiple-choice questions. If you experience an issue that affects your ability to complete the assessment, which can include (but is not limited to) issues with technology, caregiving responsibilities, or distractions within your test-taking environment, you will need to contact your instructor as soon as possible to arrange an alternate or (in the case of technical issues) extended time to write the assessment.

Tests and exams will involve multiple choice questions.

Programmable calculators, cellphones, textbooks, course notes, and other electronic devices will not be allowed during the writing of tests or final examinations. Students are reminded that simply being able to access their cellphone during an exam is academic misconduct.

THERE WILL BE NO MAKEUP OR DEFERRED QUIZZES/TESTS/EXAMS under any circumstances, nor may the quizzes/tests/exams be written early. Students unable to write the quizzes/tests/exams because of documented illness, family emergency, religious observance, or university-sanctioned event will have the weight shifted to the final examination; otherwise a grade of zero will be assigned.

Notes:

1. Students are responsible for all assigned material, e.g., supplementary material posted on D2L, regardless of whether or not the material was covered in class.

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2021-11-30

Reappraisal of Grades:

For Reappraisal of Graded Term Work, see Calendar I.2

<http://www.ucalgary.ca/pubs/calendar/current/i-2.html>

For Reappraisal of Final Grade, see Calendar I.3

<http://www.ucalgary.ca/pubs/calendar/current/i-3.html>

Academic Misconduct:

Academic Misconduct refers to student behavior that compromises proper assessment of students' academic activities and includes: cheating; fabrication; falsification; plagiarism; unauthorized assistance; failure to comply with an instructor's expectations regarding conduct required of students completing academic assessments in their courses; and failure to comply with exam regulations applied by the Registrar.

Student committing academic misconduct during the final exam will not receive a passing grade for the course.

For information on the Student Academic Misconduct Policy, Procedure and Academic Integrity, please visit: <https://www.ucalgary.ca/pubs/calendar/current/k-3.html>

Academic Accommodations:

Students seeking an accommodation based on disability or medical concerns should contact Student Accessibility Services. SAS will process the request and issue letters of accommodation to instructors. Students who require an accommodation in relation to their coursework based on a protected ground other than disability should communicate this need in writing to their instructor. The full policy on Student Accommodations is available at

<https://www.ucalgary.ca/legal-services/university-policies-procedures/accommodation-students-disabilities-procedure>

Freedom of Information and Protection of Privacy (FOIP) Act:

Personal information is collected in accordance with FOIP. Assignments can only be returned to the student and will be accessible only to authorized faculty and staff. For more information, see <https://www.ucalgary.ca/legal-services/access-information-privacy>

Copyright Legislation:

See the University of Calgary policy on Acceptable Use of Material Protected by Copyright at <https://www.ucalgary.ca/legal-services/university-policies-procedures/acceptable-use-material-protected-copyright-policy> Students who use material protected by copyright in violation of this policy may be disciplined under the Non-Academic Misconduct Policy.

Course materials created by instructors (including presentations and posted notes, labs, case studies, assignments and exams) remain the intellectual property of the instructor. These materials may NOT be reproduced, redistributed or copied without the explicit consent of the instructor. The posting of course materials to third party websites such as note-sharing sites without permission is prohibited. Sharing of extracts of these course materials with other students enrolled in the course at the same time may be allowed under fair dealing.

Recording of Lectures:

Recording of lectures is prohibited, except for audio recordings authorized as an accommodation by SAS or an audio recording for individual private study and only with the written permission of the instructor. Any unauthorized electronic or mechanical recording of lectures, their transcription, copying, or

distribution, constitutes academic misconduct. See <https://www.ucalgary.ca/pubs/calendar/current/e-6.html>.

Important Dates:

Please check: <http://www.ucalgary.ca/pubs/calendar/current/academic-schedule.html>.

Student Organizations:

Faculty of Arts Students' Association (F.A.S.A.):
Economics Department Representative
E-mail: econrep@fasaucalgary.ca
Website: www.fasaucalgary.ca.

Society of Undergraduates in Economics: <https://www.ucalgarysue.com/>.

Society of Undergraduates in Economics is a student run organization whose main purpose is to assist undergraduate economics students to succeed both academically and socially at the University of Calgary. Services include access to the exam bank, career events such as Industry Night and information sessions, mentorship programs, and social events for members. They invite you to join by contacting SUE at societyofundergradsineconomics@gmail.com.

Faculty of Arts Program Advising and Student Information Resources:

- Have a question, but not sure where to start? The Arts Students' Centre is your information resource for everything in Arts! Drop in at SS102, call them at 403-220-3580, or email them at artsads@ucalgary.ca. You can also visit the Faculty of Arts website at <http://arts.ucalgary.ca/undergraduate>, which has detailed information on common academic concerns, including program planning and advice.
- For registration (add/drop/swap), paying fees and assistance with your Student Centre, contact Enrolment Services at 403-210-ROCK [7625] or visit them in the MacKimmie Tower.

Student Support and Resources:

- See <https://www.ucalgary.ca/registrar/registration/course-outlines> for information on campus mental health resources, the Student Ombuds Office, Student Success Centre, Safewalk, and Emergency Evacuation and Assembly.
- Online writing resources are available at <https://ucalgary.ca/student-services/student-success/writing-support>.

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