

Fall 2024

Dr. Kohlhase
University of Houston

ECON 3363, Section 17101
ENVIRONMENTAL ECONOMICS
(Class meets in-person TTh 1-2:30pm in 127 Melcher Hall (M))

OFFICE: 201-H Teaching Unit 2 (TU2), 713-743-3799
email: jkohlhase@uh.edu
hours: by appointment in person or via Zoom (send email request with course name & number plus topic in subject line)
web page: <http://www.uh.edu/~kohlhase/>
CANVAS: <https://canvas.uh.edu/> (password access)

TA: Erika Callicott, a 5th year graduate student in economics; office 53 Teaching Unit 2 (TU2); email emcallic@cougarnet.uh.edu. Office hours by appointment (via TEAMS or in-person). To set up an appointment, send Erika an email request with course name & number plus topic in the subject line. TA office hours may be extended as semester progresses.

CLASS: The course is designed to teach students how to think about environmental issues using the framework of economics, especially microeconomics tools. We start with an analysis of market failures and externalities. Next we discuss potential policy approaches to environmental problems such as regulations, taxes, subsidies and marketable permits. We study methods to measure benefits and costs of environmental improvements. Then we apply these concepts to several applications including regional and local air quality and global climate change.

LEARNING OUTCOMES:

- Students will be able to use economic terminology and models of environmental issues appropriately and correctly.
- Students will be able to analyze and interpret quantitative data about the environment.
- Students will be able to organize and present material in a systematic framework based on environmental economics models.

LOGISTICS: Environmental economics will be taught face-to-face for Fall 2024. My lectures will be held in person in 127 Melcher Hall (MH) TTh 1-2:30pm. While most of my lectures will be delivered face-to-face, a few lectures may be delivered asynchronously online or synchronously online via Zoom depending on circumstances. To start the semester the TA will offer office hours by appointment in person or via Teams. As the semester progresses she may offer office hours via TEAMS in a synchronous format. She may also offer a few synchronous/asynchronous sessions to review the problem sets and exams. Supplemental course material will be posted on the class CANVAS site.

EXPECTATIONS: What do you need to do to successfully participate in class? You should attend all in-person lectures if you are feeling well. You should also be prepared to participate in Zoom or Teams synchronous lectures and be able to view asynchronous lectures recorded in Zoom or Teams. So please download video conferencing software to your devices. I will most likely use Zoom; and the TA will most likely use Teams. You must have a stable internet connection, a webcam and a microphone attached to the device you are using so that you can participate in synchronous meetings.

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PREREQUISITES:

The requirements are that you have taken introductory microeconomics (Econ 2302) at the college level, have credit for or concurrent enrollment in intermediate microeconomics (Econ 3332) and data analysis/statistics class (econ 3320) at the college level or permission from me.

REQUIRED TEXT:

(FF) Barry C. Field and Martha K. Field, *Environmental Economics: An Introduction* 2024 release, McGraw-Hill, 2024. This is the required text for the course. The ebook for this text is available via the BryteWave Course Materials tab on Canvas. A hard copy can be found at the UH Bookstore or through your preferred textbook retailer.

RECOMMENDED TEXTS:

Nathaniel O. Keohane and Sheila M. Olmstead, *Markets and the Environment*, 2nd edition 2016. Recommended. An intermediate-level treatment of environmental economics, more advanced than FF. Available online through the UH portal below. You must provide your CougarNet credentials to access:

https://uh.primo.exlibrisgroup.com/permalink/01UHO_INST/1m13ils/alma991033943488405701

Yoram Bauman and Grady Klein, *The Cartoon Introduction to Climate Change, Revised Edition, 2022*. A humorous but fact-filled look about Climate Change where the author Bauman is both a PhD economist and a stand-up comedian. Recommended. Available online through the UH portal below. You must provide your CougarNet credentials to access:

<https://ebookcentral.proquest.com/lib/uh/detail.action?docID=29133091&pq-origsite=primo>

COURSE EVALUATION:

- 25% Midterm 1 (Thurs. Sept. 19, 2024, in class)
- 25% Midterm 2 (Thurs. Oct 24, 2024, in class)
- 35% Final (Thurs. Dec. 5, 2024, 12pm-2pm, in-person)
- 15% Problem sets (3-4 assigned during term, due in person)

There are three in-person exams: two midterms and a final. The final exam is comprehensive, but the midterms cover selected materials. Exams consist of short problems with discussion. The problem sets ask you to solve problems relating to the economics of environmental issues. You may do *problem sets in groups of one to two*. All group members receive the same grade. All answers for exams, quizzes and problem sets must be original to you and written in your own words. We may play an in-class climate game. If so, I will let you know the date in advance and attendance would be mandatory.

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COURSE POLICIES: All assignments are required and must be completed and turned in on time in person in class.

NO MAKEUP EXAMS! I will follow the UH excused absence as policy outlined above. Any absence from an exam or quiz for medical reasons must be documented by your physician. Any other absence from an exam must be approved by me *in advance* in writing. Unapproved absence from any exam counts as a zero.

Classroom Conduct: I expect you to attend all classes and actively and politely engage in the discussions. I also expect you to arrive on time. Please turn off your mobile devices during class. Students are expected to abide by the University of Houston's Code of Student Conduct: (<http://www.uh.edu/dos/behavior-conduct/student-code-of-conduct/>)

Academic Honesty: To cultivate an environment of academic integrity, the University of Houston expects students to abide by the University's Undergraduate Academic Honesty Policy, found in the Undergraduate Catalog. <http://www.uh.edu/academic-honesty-undergraduate>. **All exams, quizzes and problem sets are covered by the UH Honesty policy.**

Counseling and Psychological Services: Counseling and Psychological Services (CAPS) -- www.uh.edu/caps-- are available for students having difficulties managing stress, adjusting to college, or feeling sad and hopeless. You can reach CAPS by calling 713-743-5454 during and after business hours for routine appointments or if you or somebody you know is in crisis. The "Let's Talk" program provides a drop-in consultation service at convenient locations and hours around campus. http://www.uh.edu/caps/outreach/lets_talk.html

Students with Disabilities: The College of Liberal Arts and Social Sciences, in accordance with 504/ADA guidelines, is committed to providing reasonable academic accommodations to students who request them. Students seeking accommodation must register with the Justin Dart, Jr. Student Accessibility Center 713-743-5400 and present approved documentation to me as soon as possible.

Required Information from the University of Houston

Mental Health and Wellness Resources

The University of Houston has a number of resources to support students' mental health and overall wellness, including [CoogsCARE](#) and the [UH Go App](#). UH [Counseling and Psychological Services \(CAPS\)](#) offers 24/7 mental health support for all students, addressing various concerns like stress, college adjustment and sadness. CAPS provides individual and couples counseling, group therapy, workshops and connections to other support services on and off-campus. For assistance visit uh.edu/caps, call 713-743-5454, or visit a [Let's Talk](#) location in-person or virtually. [Let's Talk](#) are daily, informal confidential consultations with CAPS therapists where no appointment or paperwork is needed.

Need Support Now?

If you or someone you know is struggling or in crisis, help is available. Call CAPS crisis support 24/7 at 713-743-5454, or the National Suicide and Crisis Lifeline: call or text [988](tel:988), or chat 988lifeline.org.

Title IX/Sexual Misconduct

Per the UHS Sexual Misconduct Policy, your instructor is a “responsible employee” for reporting purposes under Title IX regulations and state law and must report incidents of sexual misconduct (sexual harassment, non-consensual sexual contact, sexual assault, sexual exploitation, sexual intimidation, intimate partner violence, or stalking) about which they become aware to the Title IX office. Please know there are places on campus where you can make a report in confidence. You can find more information about resources on the Title IX website at <https://uh.edu/equal-opportunity/title-ix-sexual-misconduct/resources/>.

Reasonable Academic Adjustments/Auxiliary Aids

The University of Houston is committed to providing an academic environment and educational programs that are accessible for its students. Any student with a disability who is experiencing barriers to learning, assessment or participation is encouraged to contact the Justin Dart, Jr. Student Accessibility Center (Dart Center) to learn more about academic accommodations and support that may be available to them. Students seeking academic accommodations will need to register with the Dart Center as soon as possible to ensure timely implementation of approved accommodations. Please contact the Dart Center by visiting the website: <https://uh.edu/accessibility/> calling (713) 743-5400, or emailing jdcenter@Central.UH.EDU.

The [Student Health Center](#) offers a [Psychiatry Clinic](#) for enrolled UH students. Call 713-743-5149 during clinic hours, Monday through Friday 8 a.m. - 4:30 p.m. to schedule an appointment.

The [A.D. Bruce Religion Center](#) offers spiritual support and a variety of programs centered on well-being.

The [Center for Student Advocacy and Community \(CSAC\)](#) is where you can go if you need help but don't know where to start. CSAC is a “home away from home” and serves as a [resource hub](#) to help you get the resources needed to support academic and personal success. Through our [Cougar Cupboard](#), all students can get up to 30 lbs. of FREE groceries a week. Additionally, we provide 1:1 appointments to get you connected to on- and off-campus resources related to essential needs, safety and advocacy, and more. The [Cougar Closet](#) is a registered student organization advised by our office and offers free clothes to students so that all Coogs can feel good in their fit. We also host a series of cultural and community-based events that fosters social connection and helps the cougar community come closer together. Visit the CSAC homepage or follow us on Instagram: [@uh_CSAC](#) and [@uhcupbrd](#). YOU belong here.

Women and Gender Resource Center

The mission of the [WGRC](#) is to advance the University of Houston and promote the success of all students, faculty, and staff through educating, empowering, and supporting the UH community. The WGRC suite is open to you. Stop by the office for a study space, to take a break, grab a snack, or check out one of the WGRC programs or resources. Stop by Student Center South room B12 (Basement floor near Starbucks and down the hall from Creation Station) from 9 am to 5 pm Monday through Friday.

Academic Honesty Policy

High ethical standards are critical to the integrity of any institution, and bear directly on the ultimate value of conferred degrees. All UH community members are expected to contribute to an atmosphere of the highest possible ethical standards. Maintaining such an atmosphere requires that any instances of academic dishonesty be recognized and addressed. The [UH Academic Honesty Policy](#) is designed to handle those instances with fairness to all parties involved: the students, the instructors, and the University itself. All students and faculty of the University of Houston are responsible for being familiar with this policy.

Excused Absence Policy

Regular class attendance, participation, and engagement in coursework are important contributors to student success. Absences may be excused as provided in the University of Houston [Undergraduate Excused Absence Policy](#) and [Graduate Excused Absence Policy](#) for reasons including: medical illness of student or close relative, death of a close family member, legal or government proceeding that a student is obligated to attend, recognized professional and educational activities where the student is presenting, and University-sponsored activity or athletic competition. Under these policies, students with excused absences will be provided with an opportunity to make up any quiz, exam or other work that contributes to the course grade or a satisfactory alternative. Please read the full policy for details regarding reasons for excused absences, the approval process, and extended absences. Additional policies address absences related to [military service](#), [religious holy days](#), [pregnancy and related conditions](#), and [disability](#).

Recording of Class

Students may not record all or part of class, livestream all or part of class, or make/distribute screen captures, without advanced written consent of the instructor. If you have or think you may have a disability such that you need to record class-related activities, please contact the [Justin Dart, Jr. Student Accessibility Center](#). If you have an accommodation to record class-related activities, those recordings may not be shared with any other student, whether in this course or not, or with any other person or on any other platform. Classes may be recorded by the instructor. Students may use instructor's recordings for their own studying and notetaking. Instructor's recordings are not authorized to be shared with anyone without the prior written approval of the instructor. Failure to comply with requirements regarding recordings will result in a disciplinary referral to the Dean of Students Office and may result in disciplinary action.

Other Recommended Information from the University of Houston

Resources for Online Learning

The University of Houston is committed to student success and provides information to optimize the online learning experience through our [Power-On](#) website. Please visit this website for a comprehensive set of resources, tools, and tips including: obtaining access to the internet, AccessUH, Blackboard, and Canvas; using your smartphone as a webcam; and downloading Microsoft Office 365 at no cost. For questions or assistance contact UHOnline@uh.edu.

UH Email

Please check and use your CougarNet email (ends in uh.edu) for communications related to this course. Faculty use their CougarNet email to respond to course-related inquiries such as grade queries or progress reports for reasons of FERPA. To access your CougarNet email, [login](#) to your Microsoft 365 account with your CougarNet credentials. Visit [University Information Technology \(UIT\)](#) for instructions on how to connect your CougarNet e-mail on a mobile device.

Syllabus Changes

For a variety of reasons, the instructor may need to make modifications to the course syllabus and may do so at any time. Notice of such changes will be announced as quickly as possible through announcements on Canvas and via group emails to your [CougarNet email account](#) (ends in uh.edu).

Webcams

Access to a webcam is required for students participating remotely in this course. Webcams must be turned on during synchronous lectures to ensure active participation in lectures.

Artificial Intelligence: Use only with acknowledgement

Students are allowed to use advanced automated tools (artificial intelligence (AI) or machine learning tools such as ChatGPT or Dall-E 2) on problem sets in this course only if that use is properly documented and credited. For example, text generated using ChatGPT-3 should include a citation such as: “Chat-GPT-3. (YYYY, Month DD of query). “Text of your query.” Generated using OpenAI. <https://chat.openai.com/>” Material generated using other tools should follow a similar citation convention. If the use of AI is not documented, the problem set may be scored as a zero. AI is forbidden to be used on exams.

Environmental Economics Course Details

Note: all readings are required unless marked “optional” with a superscript “T”

<u>TOPIC</u>	<u>FF TEXTBOOK/READING</u>
<i>I. Introduction</i>	
A. What is Environmental Economics?	ch. 1
B. Linking the Economy and the Environment	ch. 2
<i>II. Modeling Environmental Problems</i>	
A. Review of Market Models	ch. 3
B. Market Failures	ch. 4
Tragedy of the Commons, revisited	Frischmann (2018)
C. Economics of Environmental Quality	ch. 5
<i>III. Analytic Tools for Environmental Planning</i>	
A. Frameworks of Analysis	ch. 6
B. Assessing Benefits	ch. 7, Carson (2012)
Houston issues	Bishop (2017)
C. Assessing Costs	ch. 8
<i>IV. Modeling Solutions to Environmental Problems</i>	
A. Criteria for Evaluating Environmental Policies	ch. 9
B. Decentralized Policies	ch. 10, omit pp.171-174
C. Conventional Solutions: Command and Control Strategies	ch. 11
D. Economic Solutions: the Market Approach	
1. Charges (Taxes) & Subsidies	ch. 12
2. Market Trading Systems	ch. 13
	Schmalensee & Stavins (2013)
<i>V. Air Quality</i>	
A. Defining Air Quality Standards	ch. 15
Houston issues	Levin & Shelly (2015) ^T
	Forswall&Higgins (2005) ^T
B. Global Issues—Climate Change	ch. 18
1. Primer on Climate Change	CBO(2005), Stavins (2019)
	Stern (2007) ^T
2. Economic Effects of Climate Change	Tol (2009)

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3. IPCC Assessment Reports	IPCC (2007) ^T IPCC (2013) ^T IPCC (2023)-Summary for Policymakers NCA-5-overview (2023)
4. Treaties and Regulations	ch. 19, only pp. 359-369 UNFCCC (2008) ^T UNFCCC (2015) ^T
<i>VI. Other Topics (if time)</i>	
A. Water Issues	ch.14
B. State and Local Environmental Issues	ch. 17

***NOTE:** Journal articles and non-FF book chapters are posted on Canvas; a few additional readings may be assigned during the course. As instructor, I reserve the right to alter the course topics, readings and policies during the course and will announce changes in class, post on Canvas and send group emails to your UH CougarNet/exchange email address (ends in uh.edu). Students are expected to be aware of any of the changes presented by the instructor during the course.

REFERENCES FOR READINGS The following are available either online or via Canvas. (additional articles may be added during the course)

Richard C. Bishop *et al*, "Putting a Value on Injuries to Natural Assets: the BP Oil Spill, *Science*, 2017, 356(6335):253-254, available at <chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://epic.uchicago.edu/wp-content/uploads/2019/07/Publication-8.pdf>

Richard T. Carson, "Contingent Valuation: A Practical Alternative When Prices Aren't Available." *Journal of Economic Perspectives*, 2012, 26(4): 27-42, available at <https://www.aeaweb.org/articles?id=10.1257/jep.26.4.27>

CBO (Congressional Budget Office), "Limiting Carbon Dioxide Emissions: Prices Versus Caps," March 15, 2005, pp. 1-5, available to download at <https://www.cbo.gov/sites/default/files/109th-congress-2005-2006/reports/03-15-pricevsquantity.pdf>

Clayton D. Forswall and Kathryn E. Higgins, "Clean Air Act Implementation in Houston: An Historical Perspective 1970-2005," Feb. 2005 report, Shell Center for Sustainability, Environmental and Energy Systems Institute. Available to download at: <https://hdl.handle.net/1911/107669>

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Brett Frischmann, “The Tragedy of the Commons, Revisited,” *Scientific American, Observations*, November 19, 2018, available at <https://blogs.scientificamerican.com/observations/the-tragedy-of-the-commons-revisited/>

IPCC (Intergovernmental Panel on Climate Change), “Climate Change 2007: Synthesis Report Summary for Policy Makers,” 2007, available to download from https://www.ipcc.ch/site/assets/uploads/2018/02/ar4_syr_spm.pdf

IPCC (Intergovernmental Panel on Climate Change), “Climate Change 2013: Physical Science Basis, Technical Summary,” 2013, available to download from https://www.ipcc.ch/site/assets/uploads/2018/02/WG1AR5_TS_FINAL.pdf

IPCC (Intergovernmental Panel on Climate Change), “Summary for Policymakers.” In: “Climate Change 2023: Synthesis Report.” Contribution of Working Groups I, II and III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, H. Lee and J. Romero (eds.)]. IPCC, Geneva, Switzerland, pp. 1-34. Available to download from https://www.ipcc.ch/report/ar6/syr/downloads/report/IPCC_AR6_SYR_SPM.pdf

Ilan Levin and Adrian Shelley, “Houston Smog Levels Up in 2015,” *Environmental Integrity Project News*, Dec. 18, 2015, available to download from <https://www.environmentalintegrity.org/news/houston-smog-levels-up-in-2015/>

National Climate Assessment-V (NCA-5), 2023, Ch. 1. “Overview: Understanding Risks, Impacts, and Responses.” In: *Fifth National Climate Assessment*. Crimmins, A.R., C.W. Avery, D.R. Easterling, K.E. Kunkel, B.C. Stewart, and T.K. Maycock, Eds. U.S. Global Change Research Program, Washington, DC, USA. Available to download from <https://doi.org/10.7930/NCA5.2023.CHI> or from <https://nca2023.globalchange.gov/#overview>

Richard Schmalensee and Robert Stavins., "The SO2 Allowance Trading System: The Ironic History of a Grand Policy Experiment" *Journal of Economic Perspectives*, Winter 2013, 27(1): 103-122, available at <https://www.aeaweb.org/articles?id=10.1257/jep.27.1.103>

Nicholas Stern, *The Economics of Climate Change: The Stern Review*,” published for the Treasury of the United Kingdom, 2007, by Cambridge University Press, draft version available to download from https://webarchive.nationalarchives.gov.uk/20100407172811/http://www.hm-treasury.gov.uk/stern_review_report.htm

Robert Stavins, “The Future of US Carbon-Pricing Policies,” from his blog *An Economic View of the Environment*, May 30, 2019, available at

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<http://www.robertstavinsblog.org/2019/05/30/the-future-of-u-s-carbon-pricing-policy/>

Richard S. J. Tol, "The Economic Effects of Climate Change." *Journal of Economic Perspectives*, 2009, 23(2): 29-51, available at
<https://www.aeaweb.org/articles?id=10.1257/jep.23.2.29>

UNFCCC (United Nations Framework Convention on Climate Change), *Kyoto Protocol Reference Manual*, 2008 available to download from
https://unfccc.int/resource/docs/publications/08_unfccc_kp_ref_manual.pdf

UNFCCC (United Nations Framework Convention on Climate Change), "Adoption of the Paris Agreement," 2015, available to download from
<https://unfccc.int/resource/docs/2015/cop21/eng/109r01.pdf>

SELECTED INTERNET SITES -- ENVIRONMENTAL ISSUES

Government Agency Sites

<https://www.epa.gov/>

Operated by the U.S. Environmental Agency. Extensive data on all aspects of U.S. environmental issues. If you append "region6" to the address you will reach the EPA's Region 6, which includes Texas.

<https://www3.epa.gov/enviro/myenviro/>

Operated by the USEPA, MyEnvironment provides access to a cross-section of environmental data for any geographical location in the U.S.

<https://www.tceq.texas.gov/>

Operated by the Texas Commission on Environmental Quality (before 9/02 known as Texas Natural Resource Conservation Commission, TNRCC). Data on Texas pollution problems. Contains Houston's Clean Air Plans (also called Houston's State Implementation Plans).

https://www.tceq.texas.gov/airquality/monops/forecast_today.html

Also operated by the Texas Commission on Environmental Quality. This website has information on daily air quality by metropolitan areas in TX as well as data on historical air pollution and measurements.

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<http://www.greenhoustontx.gov/reports.html>

The Resilience and Sustainability Office operated by the City of Houston; “Green Houston Links” provides several links to local environmental issues.

Sites from independent, nonprofit research institutions

<https://www.rff.org/>

Resources for the Future, an independent nonprofit research center, analyzes the environment in the US. Especially useful is the online magazine, *Resources*. You can sign up for digital access to the radio podcast and weekly newsletters.

Environmental Activist Sites that contain some useful data

<https://j4502-fs18.github.io/Right-to-Know/index.html>

Hosted by the Houston Chronicle. The Right-to-Know network (established in 1989 under the Community Right to Know Act). Has various databases, including the Toxics Release Inventory (TRI), and provides links to other environmental web sites.

<http://www.cechouston.org>

Operated by the Citizen’s Environmental Coalition of Houston (CEC). The CEC has over 120 members and includes environmental nonprofits, government agencies & elected officials from the Houston-Galveston area. Directory includes profiles of members.

<https://airalliancehouston.org/>

Air Alliance Houston is the result of a merger between the Galveston-Houston Association for Smog Prevention (GHASP) and Mothers for Clean Air in 2010. Excellent coverage of local air issues.

Environmental Blogs by Nonprofits and Economics Professors

<https://www.resources.org/common-resources/>

Common Resources blog from the nonprofit Resources for the Future. Offers analysis and commentary about current environmental and energy issues.

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<https://www.env-econ.net/>

An environmental economics blog written by Profs. John Whitehead (OSU) and Tim Habib (Appalachian State Univ).

<https://matthewekahn.substack.com/>

Climate economics website about the microeconomic approach to climate change adaptation. Contains environmental and urban economics blog/podcasts by Prof. Matt Kahn of USC. Users can subscribe to get full access to the newsletter and website.

<http://www.robertstavinsblog.org/author/rstavins/>

Environmental economics blog written by Prof. Robert Stavins of Harvard University Kennedy School.