ARE 264: Environmental and Resource Economics
Course Syllabus: Spring 2022

Version: January 14, 2022

Instructor: James Sallee
Email: sallee@berkeley.edu
Office hours: Tu 3:30-4:30, or by appointment, Giannini 322, Zoom link for OH in case we schedule meetings remotely (https://berkeley.zoom.us/j/377786786)

Time: T Th 2:00-3:30
Location: Giannini 201
Note: In the event that we are forced to start class via Zoom Lectures will be recorded. Attending lecture indicates your consent to be recorded. Zoom link for class, just in case this happens (https://berkeley.zoom.us/j/94670812116)

This syllabus describes the first half of 264. The second half will be taught by Reed Walker.

Course description: This course is intended to prepare Ph.D. students to conduct original research in environmental economics. To do so, the course aims to expose students to classic insights and questions about the economics of resources and the environment, with a focus on the potential role of public policy to improve market outcomes where externalities are present.

This course is designed as a companion course to ARE 261, but it is possible to take this course without taking 261 first.

Key due dates:

- 2/1 Leaks paper idea due (11:59 pm)
- 2/13 Problem set 1 due (11:59 pm)
- 2/27 Writing assignment due (11:59 pm)
- 3/10 Problem set 2 due (11:59 pm)

Grading and assignments: The final grade in 264 will be based equally on this class portion and the portion taught by Professor Walker. For this class portion, the grade will be based on four assignments (listed above) and class participation. Each of these five factors counts equally.

Participation is based on class contributions and completion of bullet points submitted prior to lecture on selected papers. "Deliverables" required for each lecture will count equally on a complete/incomplete grading basis, with the exception of one presentation which will count for 5 points. Two relatively traditional problem sets are aimed at getting students to teach themselves additional results and to bring students into close contact with particular models. Students are encouraged to work together on problem sets, but each student must turn in an individual set of answers. Two

other assignments must be completed individually and will be explained further.

Text books: There is no required or comprehensive textbook for this course, largely because no single book (or no pair of books) covers enough material to compel its purchase. In lieu of textbook treatments, the reading list contains a number of survey articles. Beyond the ones listed here, there exist many useful chapters in the Elsevier Handbook series, as well as short articles in the *Review of Environmental Economics and Performance* covering many seminal topics.

Nevertheless, a few texts are listed here, which were used in the formation of the course and may be useful to some students. Kolstad *Environmental Economics* is a nice overview of environmental economics, but the presentation is at the undergraduate level. Baumol and Oates *The Theory of Environmental Policy* is a more technical treatment of core policy design issues, though the presentation is somewhat dated. Salanie *Microeconomics of Market Failures* is a useful primer for externalities and public goods. Phaneuf and Requate's *A Course in Environmental Economics* looks to be a comprehensive and recent resource.

Essential reading list (subject to update):
We will meet 14 times. The most important readings are listed in the table below for each of our meetings. For most lectures, you have a deliverable that is due before class. In the table below, deliverables are denoted in bold font with an asterisk. Deliverables are either with respect to a paper (in which case just the paper is listed in the table) or it is some other exercise, in which case it is denoted as **b(·)**.

Some deliverables are "think about this problem" prompts. The main idea there is to try to get you to spend 20-30 minutes thinking about an economic problem before we discuss a paper that treats that issue. Typically I want you to think about this issue and write out a brief note (say, one paragraph) before you do the associated reading. You turn this in to me via bCourses before class. Deliverables that are associated with a specific paper are for you to read the paper and then write out a few bullet points, turned in before class via bCourses. The point here is to get you prepared for discussion in class. There are a few other types of deliverables that will be explained below.

	Date	Title	Please read (* indicates deliverable required)
1	Tu Jan 18	The Pigouvian prescription	Cropper & Oates 1992, **b(intake*)**
2	Th Jan 20	Tradable permits	Goulder & Parry 2008, **b(criteria*)**
3	Tu Jan 25	Instrument choice	Pizer & Prest 2020, **Coase 1960***
4	Th Jan 27	Performance standards	**Jacobsen & van Benthem 2013***, Borenstein 2015
5	Tu Feb 1	Research workshop	**b(Leaks*)**, **b(Tarduno 2021*)**
6	Th Feb 3	Incidence and equity	Kaplow 2004, Fullerton 2011, **b(equity*)**
7	Tu Feb 8	Compensation and targeting	**b(Sallee 2020*)**, ALT 2018
8	Th Feb 10	Second-best (targeting)	Knittel & Sandler 2018, JKSvB, **b(hetero*)**
9	Tu Feb 15	Reviving the first-best	Segerson 1988, **b(ambient*)**
10	Th Feb 17	Modeling workshop	**b(upload notes*)**
11	Tu Feb 22	Second-best (fiscal)	Goulder 2013, Finkelstein & Hendren 2020
12	Th Feb 24	Second-best (other problems)	**Goulder, Hafstead & Williams 2016***
13	Tu Mar 1	Behavioral EEE I	**Myers, Puller and West 2020***, AMT 2014
14	Th Mar 3	Behavioral EEE II	Allcott and Kessler 2015, **b(WTP*)**

Longer reading list:
Readings are ordered by topic and listed in an order in which I think it makes most sense to read them. Readings marked with a B are more general background. Readings marked with a * are articles that we will read that required you to submit bullet points on before class. This extended reading list is meant to be a hybrid between our course plan and a reference guide for later use. I will plan to update the later material after we have decided on the additional topics to be covered in the second half.

I Introduction to externality-correcting policy (lectures 1-4)

I.i Pigouvian taxation (lecture 1)

B Cropper and Oates, 1992. "Environmental Economics: A Survey" *Journal of Economic Literature* v.30 (2), June, pp. 675-740.

B Helfand, Berck and Maull, 2003. "The Theory of Pollution Policy" *Handbook of Environmental Economics* v. 1, pp. 249-303.

B Chetty, 2009. "Sufficient Statistics for Welfare Analysis: A Bridge Between Structural and Reduced-Form Methods" *Annual Review of Economics* 1, pp. 451-487.

I.ii Tradable permits and introduction to instrument choice (lecture 2)

B Goulder and Parry, 2008. "Instrument Choice in Environmental Policy" *Review of Environmental Economics and Policy*

- Weitzman, 1974. "Prices vs. Quantities" *Review of Economic Studies* 41(4), October, pp. 477-491

- Fowlie and Perloff, 2013. "Distributing Pollution Rights in Cap-and-Trade Programs: Are Outcomes Independent of Allocation?" *Review of Economics and Statistics*

B Schmalensee and Stavins, 2015. "Lessons Learned from Three Decades of Experience with Cap-and-Trade" Working Paper.

B Tietenberg, 2002. "The Tradable Permits Approach to Protecting the Commons: What Have We Learned?" Working Paper.

- Montgomery, 1972. "Markets in Licenses and Efficient Pollution Control Programs" *Journal of Economic Theory* 5, pp. 395-418.

- Keohane, 2009. "Cap and Trade, Rehabilitated: Using Tradable Permits to Control U.S. Greenhouse Gases" *Review of Environmental Economics and Performance*

- Borenstein, Bushnell, Wolak and Zaragoza-Watkins, 2019. "Expecting the Unexpected: Emissions Uncertainty and Environmental Market Design" *American Economic Review*

I.iii More on instrument choice and the Coase Theorem (lecture 3)

* Coase, 1960. "The Problem of Social Cost" *Journal of Law and Economics*

- Usher, 1998. "The Coase Theorem is Tautological, Incoherent or Wrong" *Economics Letters*

* Pizer and Prest, 2019. "Prices versus Quantities with Policy Updating" *Journal of the Association of Environmental and Resource Economists*

- Helfand, 1991. "Standards versus Standards: The Effects of Different Pollution Restrictions" *American Economic Review*, 81(3), June, pp. 622-634.

- Montero, Juan-Pablo, 1999. "Voluntary Compliance with Market-Based Environmental Policy: Evidence from the U.S. Acid Rain Program" *Journal of Political Economy* 107(5), October, pp. 998-1033.

- Pizer, 2002. "Combining Price and Quantity Controls to Mitigate Global Climate Change" *Journal of Public Economics*, 85(3).

Ellickson (1991) on Coase theorem

Deryugina, Moore, and Tol

I.iv Performance standards (lecture 4)

B Borenstein, 2015. "A Microeconomic Framework for Evaluating Energy Efficiency Rebound and Some Implications" *Energy Journal* 36(1) January, pp. 1-21.

* Jacobsen and van Benthem, 2015. "Vehicle Scrappage and Gasoline Policy" *American Economic Review* 105 (3), pp. 1312-1338.

- Holland, Hughes and Knittel, 2009. "Greenhouse Gas Reductions Under Low Carbon Fuel Standards?" *American Economic Journal: Economic Policy* 1(1), February.

- Goulder, Jacobsen and van Benthem, 2012. "Unintended Consequences from Nested State and Federal Regulations: The Case of the Pavley Greenhouse-Gas-Per-Mile Limits" *Journal of Environmental Economics and Management* 63, pp. 187-207.

B Anderson and Sallee, 2015. "Designing Policies to Make Cars Greener: A Review of the Literature" Working Paper.

B Gillingham, Rapson and Wagner, 2015. "The Rebound Effect and Energy Efficiency Policy" *Review of Environmental Economics and Policy.*

study Cash for Clunkers

- West, Hoekstra, Meer and Puller, 2017. "Vehicle Miles (Not) Traveled: Fuel Economy Requirements, Vehicle Characteristics, and Household Driving" *Journal of Public Economics.*

- Ito and Sallee, 2018. "The Economics of Attribute-Based Regulation: Theory and Evidence from Fuel-Economy Standards" *Review of Economics and Statistics*

II Research workshop (lecture 5)

* Tarduno, 2021. "For Whom the Bridge Tolls: Congestion, Air Pollution, and Second-Best Road Pricing."

* Taylor, 2020. "Writing the Intro to Your Economics Research Paper." (link)

• Bellemare, 2020. "How to Write Applied Papers in Economics."

B McCloskey, 1999. *Economical Writing* Revised Second Edition, Waveland Press.

III Incidence and equity (lectures 6-7)

III.i Incidence (lecture 6)

B Kotlikoff and Summers, 1987. "Tax Incidence" *Handbook of Public Economics* v.2, pp. 1043-1092.

B Fullerton, 2011. "Six Distributional Effects of Environmental Policy" *Risk Analysis* v.31(6), pp. 923-929.

* Kaplow, 2004. "On the (Ir)relevance of Distribution and Labor Supply Distortion to Government Policy" *Journal of Economic Perspectives*

• Weyl and Fabinger, 2013. "Pass-Through as an Economic Tool: Principles of Incidence under Imperfect Competition" *Journal of Political Economy* 121(3), June, pp. 528-583.

• Fullerton and Heutel, 2010. "The General Equilibrium Incidence of Environmental Taxes" *Journal of Public Economics*

• Fullerton and Heutel, 2010. "The General Equilibrium Incidence of Environmental Mandates" *American Economic Journal: Economic Policy* 2, August, pp. 64-89.

• Hassett, Mathur and Metcalf, 2009. "The Incidence of a U.S. Carbon Tax: A Lifecycle and Regional Analysis" *Energy Journal.*

• Borenstein and Davis, 2015. "The Distributional Effect of U.S. Clean Energy Tax Credits" *Tax Policy and the Economy* v.30.

III.ii Compensation (lecture 7)

* Sallee, 2019. "Pigou Creates Losers: On the Implausibility of Creating Pareto Improvements from Efficiency-Enhancing Policies" Working Paper.

• ALT "Ramsey Strikes Back"

• Allcott, Lockwood and Taubinsky, 2017. "Regressive Sin Taxes" NBER WP 23085.

IV Second-best policy (lectures 8-14)

IV.i Second-best policy when emissions are hard to target (lectures 8-9)

- Diamond, 1973. "Consumption Externalities and Imperfect Corrective Pricing" *Bell Journal of Economics and Management Science* 4(2), Autumn, pp. 526-538.

* Knittel and Sandler, 2018. "The Welfare Impact of Indirect Pigouvian Taxation: Evidence from Transportation" *American Economic Journal: Economic Policy.*

- Holland and Yates, 2015. "Optimal trading ratios for pollution permit markets" *Journal of Public Economics*

* Segerson, 1988. "Uncertainty and Incentives for Nonpoint Pollution Control" *Journal of Environmental Economics and Management*

- Kotchen and Segerson, 2018. "On the use of group performance and rights for environmental protection and resource management" *PNAS*

- Fullerton and Wolverton, 1997. "The Case for a Two-Part Instrument: Presumptive Tax and Environmental Subsidy" NBER Working Paper.

- Fullerton and Wolverton, 2005. "The two-part instrument in a second-best world" *Journal of Public Economics* 89, pp. 1961-1975.

B Bennear and Stavins, 2007. "Second-best Theory and the Use of Multiple Policy Instruments" *Environmental and Resource Economics* 37, pp. 111-129.

- Larson, Helfand and House, 1996. "Second-best Tax Policies to Reduce Nonpoint Source Pollution" *American Journal of Agricultural Economics.*

* Jacobsen, Knittel, Sallee and van Benthem, 2018. "The Use of Regression Statistics to Analyze Imperfect Pricing Policies" Working Paper. (Get from my website, not older NBER version.)

- Mendelsohn, 1986. "Regulating Heterogeneous Emissions" *Journal of Environmental Economics and Management* 13, pp. 301-312.

IV.ii Modeling workshop (lecture 10)

IV.iii Second-best policy under fiscal distortions (lecture 11)

- Sandmo, 1975. "Optimal Taxation in the Presence of Externalities" *Swedish Journal of Economics* 77(1), March, pp.86-98.

- Kopczuk, 2003. "A Note on Optimal Taxation in the Presence of Externalities" *Economics Letters* 80, pp. 81-86.

B Goulder, 2013. "Fiscal Interactions and Climate Change Policy" *Energy Economics*, 40, December.

* Finkelstein and Hendren, 2020. "Welfare Analysis Meets Causal Inference" *Journal of Economic Perspectives*

- Mayshar, 1990. "On Measures of Excess Burden and their Applications" *Journal of Public Economics* 43(3), pp. 263-289.

- Bovenberg and de Mooij, 1994. "Environmental Levies and Distortionary Taxation" *American Economic Review*, September.

* Boomhower and Davis, 2014. "A Credible Approach for Measuring Inframarginal Participation in Energy Efficiency Programs" *Journal of Public Economics*, 113, pp. 67-79.

* Goulder, Hafstead and Williams, 2016. "General Equilibrium Impacts of a Federal Clean Energy Standard" *American Economic Journal: Economic Policy*, 8(2), pp. 186-218.

IV.iv Second-best policy when there are multiple distortions (lecture 12)

- Buchanan, 1969. "External Diseconomies, Corrective Taxes, and Market Structure" *American Economic Review* 59(1), pp. 174-177.

- Barnett, 1980. "The Pigouvian Tax Rule Under Monopoly" *American Economic Review* 70(5), December, pp. 1037-1041.

- Parry and Small, 2005. "Does Britain or the United States Have the Right Gasoline Tax? *American Economic Review* 95(4), September, pp. 1277-1289.

- Fowlie, Reguant and Ryan, 2016. "Market-Based Emissions Regulations and Industry Dynamics" *Journal of Political Economy*

* Fowlie and Mueller, 2019. "Market-Based Emissions Regulation When Damages Vary across Sources: What Are the Gains from Differentiation?" *Journal of the Association of Environmental and Resource Economists*

- Holland, 2012. "Emissions taxes versus intensity standards: Second-best environmental policies with incomplete regulation" *Journal of Environmental Economics and Management*

IV.v Behavioral economics and environmental policy (lectures 13-14)

B Allcott and Greenstone, 2012. "Is There an Energy Efficiency Gap?" *Journal of Economic Perspectives*, 26(1), Winter, pp. 3-28.

B Allcott, 2015. "Paternalism and Energy Efficiency: An Overview" *Annual Review of Economics.*

- Myers, 2019. "Asymmetric Information in Residential Rental Markets: Implications for the Energy Efficiency Gap" *American Economic Journal: Economic Policy.*

- Myers, Puller and West, 2020. "Mandatory Energy Efficiency Disclosure in Housing Markets" WP.

* Allcott, Mullainathan and Taubinsky, 2014. "Energy Policy with Externalities and Internalities" *Journal of Public Economics*, 112, April, pp. 72-88.

- Allcott and Kessler, 2015. "The Welfare Effects of Nudges: A Case Study of Energy Use Social Comparisons" Working Paper.

- Gillan, 2018. "Dynamic Pricing, Attention, and Automation: Evidence from a Field Experiment in Electricity Consumption" Working Paper.

- Davis and Metcalf, 2014. "Does Better Information Lead to Better Choices? Evidence from Energy-Efficiency Labels" Working Paper.

- Ito, Ida and Tanaka, 2018. "The Persistence of Moral Suasion and Economic Incentives: Field Experimental Evidence from Energy Demand" *American Economic Journal: Economic Policy*

* Houde, 2017. "How Consumers Respond to Environmental Certification and the Value of Energy Information" RAND.

* Berkouwer, 2020. "Credit and attention in the adoption of profitable energy efficient technologies in Kenya" WP.