

Environmental Economics: Climate Change

2019-2020 Academic Year
Master of Research in Economics, Finance and Management

1. Description of the subject

1. Environmental Economics: Climate Change
2. Code: 32589
3. Total credits: 3 ECTS Workload: 75 hours
4. Term: 3rd
5. Type of subject: Optative
6. Department of Economics and Business
7. Teaching team: Humberto Llavador.

2. Teaching guide

◉ Introduction

Climate change is arguably the most complex and pressing environmental problem the world has ever faced. This course attacks the problem of climate change from the perspective of economics. It combines an introduction to the economics of climate change with an emphasis on some specific topics, like the social cost of carbon, international climate negotiations, or distributional equity issues. The aim is to provide you with an understanding of what are the relevant economic issues on climate change and the existing debates. Hopefully it will expand your view of economics and stimulate your own research ideas. The course is also open to MSc students.

◉ Teaching methodology

The course comprises an introduction to climate change economics with an emphasis on three or four topics. It is structured around 10 lectures with small group discussions around specific articles. The list below presents a list of potential topics with representative references. The content and the specific list of articles are susceptible of change.

◉ Contents

1. Introduction. Climate Change and the Economics of Climate Change
 - Nordhaus, W. Climate Change: The Ultimate Challenge for Economics. *Am. Econ. Rev.* 109, 1991–2014 (2019).
 - Stavins, R.N. “The Problem of the Commons: Still Unsettled after 100 Years” *American Economic Review* 101(1):81-82, 96-103 (2011).
2. Integrated Assessment Modeling
 - Dietz, S. & Venmans, F. Cumulative carbon emissions and economic policy: In search of general principles. *J. Environ. Econ. Manage.* 96, 108–129 (2019).
 - Nordhaus, W. Evolution of modeling of the economics of global warming: changes in the DICE model, 1992–2017. *Clim. Change* 148, 623–640 (2018).
 - Nordhaus, W. Integrated economic and climate modeling. in *Handbook of Computable General Equilibrium Modeling* 1, 1069–1131 (Elsevier B.V., 2013).
 - Pindyck, R. S. Climate Change Policy: What Do the Models Tell Us? *J. Econ. Lit.* 51, 1–23 (2013).
3. Equity and climate change
 - Broome, J. The ethics of Climate Change. *Sci. Am.* June, 96–102 (2008).
 - Llavador, H., Roemer, J. E. & Silvestre, J. *Sustainability for a Warming Planet*, Harvard University Press (2015).
 - Nordhaus, W. *A question of balance*, Yale University Press (2008)
 - Stern, N. *The Stern Review: The economics of climate change*, Cambridge University Press (2007)
4. Inequality and climate change: The global North and South
 - Bowen, A., Campiglio, E. & Martinez, S. H. An ‘equal effort’ approach to assessing the North–South climate finance gap. *Clim. Policy* (2015).
 - Chakravarty, S. et al. Sharing global CO₂ emission reductions among one billion high emitters. *Proc. Natl. Acad. Sci. U. S. A.* 106, 11884–11888 (2009).
 - Chancel, L. & Piketty, T. *Carbon and Inequality: from Kyoto to Paris*. *Paris Sch. Econ.* (2015).
 - Llavador, H., Roemer, J. E. & Silvestre, J. North–south convergence and the allocation of CO₂ emissions. *Clim. Change* 130, 383–395 (2015).

5. Damages or Impacts of Climate Change
 - Dennig, F., Budolfson, M. B., Fleurbaey, M., Siebert, A. & Socolow, R. H. Inequality, climate impacts on the future poor, and carbon prices. *Proc. Natl. Acad. Sci.* 112, 15827–15832 (2015).
 - Diaz, D. B. & Moore, F. C. Quantifying the Economic Risks of Climate Change. *Nat. Clim. Chang. Rev.* (2017). doi:10.1038/nclimate3411
 - Hsiang, S. et al. Estimating economic damage from climate change in the United States. *Science* 356, 1362–1369 (2017).
 - Revesz, R. L. et al. Global warming: Improve economic models of climate change. *Nature* 508, 173–175 (2014).

6. Carbon pricing and the Social Cost of Carbon
 - Fleurbaey, M., Ferranna, M., Budolfson, M., Denning, F., Mintz-Woo, K., Socolow, R., Spears, D., and Zuber, S. The Social Cost of Carbon: Valuing Inequality, Risk, and Population for Climate Policy. *The Monist*, Volume 102, Issue 1, January 2019, Pages 84–109
 - Nordhaus, W. D. Revisiting the social cost of carbon. *Proc. Natl. Acad. Sci.* 114, 1518–1523 (2017).
 - Ricke, K., Drouet, L., Caldeira, K. & Tavoni, M. Country-level social cost of carbon. *Nat. Clim. Chang.* 8, 895–900 (2018).

7. International agreements, cooperation and carbon markets
 - Gollier, C. and Tirole, J. “Negotiating effective institutions against climate change”, *Economics of Energy and Environmental Policy*, vol. 4, n. 2, June 2015, pp. 5–27.
 - Keohane, R. O. & Victor, D. G. Cooperation and discord in global climate policy. *Nat. Clim. Chang.* 6, 570–575 (2016).
 - Llavador, H. and Roemer, J. Global Unanimity Equilibrium on the Carbon Budget. Cowles Foundation Discussion Paper No. 2172
 - Nordhaus, B. W. Climate Clubs : Overcoming Free-riding in International Climate Policy. *Am. Econ. Rev.* 105, 1339–1370 (2015).
 - Weitzman, M. L. Can Negotiating a Uniform Carbon Price Help to Internalize the Global Warming Externality? *J. Assoc. Environ. Resour. Econ.* 1, 29–49 (2014).

🔗 Assessment and Grading System

Evaluation will be based on in-class participation and/or a presentation or a term-paper, depending on enrolment.

The course will be graded on a 0-10 scale:

0-4.5	Fail
5-6	C
6.5-7.5	B
8-9	A
9.5-10	A+