Instructor:
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Office Hours: Tue, Thu, 10-11 a.m. in CAS 116D

Economics for Natural Resources and the Environment (ENST 387)
Location: WPH 207
12:30-1:50 pm Tuesday, Thursday
Fall 2017, 4 units

Course overview: This class will introduce students to the basic precepts of environmental and resource economics, with an eye toward the increasing influence of resource economics policy responses to environmental problems. The theoretical basis is then applied to such aspects as traditional and "green" energy, the energy-water nexus, air quality, and environmental management, with an emphasis on resource sustainability and conservation. This course offers a policy-oriented approach and introduces economic theory in the context of debates and empirical work from the field. Students complete the course with a global perspective of both environmental and natural resource economics.

This course is built both on lectures and on student discussion and debate. Students are expected to study the required text assignment before lectures. Students will be also asked to prepare short presentations on major issues discussed in the course.

Readings:
1. Textbook: Tietenberg & Lewis (T&L). *Environmental & Natural Resource Economics*, 10th edition. ISBN: 9780133479690. Other editions of the textbook are OK to use.

2. Other readings will be posted on the Blackboard on the weekly basis.

Course goals:
1. Be able to use critically the many sources of information about environmental economic policies to solve empirical problems.
2. Be able to use theoretical perspectives to identify and explain domestic and global environmental problems and the linkages among them.
3. Demonstrate the habit of accessing sources of environmental knowledge and the skill to critically interpret, assess and apply evidence.

Learning objectives:
- an interdisciplinary approach to complex environmental problems using basic tools of economics and international processes;
- the ability to work effectively as a member of an interdisciplinary team on complex problems involving multiple competing stakeholders and agendas;
- the ability to critically evaluate the economic and policy ramifications of diverse energy portfolios on air and water quality, climate, weapons proliferation and societal stability;
- an experience-based understanding of economic policies in California including water and energy needs, air quality, marine and coastal issues;
- the ability to write effectively about complex environmental problems and do so for both specialist and general audiences with equal facility; and
- the ability to apply quantitative reasoning skills to environmental problems including basic calculations related to sustainability issues and the use of quantitative methods in data analysis and argumentation.

Please refer to https://dornsife.usc.edu/environmental-studies/learning-objectives/ for more information.

Research paper:
The writing assignment of the course is an original research paper of **minimum 15 pages** (including bibliography, double-spaced, 1-inch margins). This will be on a topic of the student's choice, refined in collaboration with the instructors and reflecting the student's research interests. Please use; double-spaced. Required number of sources: **15 per paper**. The instructors will provide additional guidelines on the required diversity of sources. When you submit the paper, please give a hard copy to the instructor AND upload the paper on the Blackboard in "Assignments."

Grading

Midterm Exam 1	20%
Midterm Exam 2	20%
Final Exam	30%
Research Paper	15%
Quizzes/Homework/Presentations in class	15%

Academic Conduct
Plagiarism – presenting someone else's ideas as your own, either verbatim or recast in your own words – is a serious academic offense with serious consequences. Please familiarize yourself with the discussion of plagiarism in *SCampus* in Section 11, *Behavior Violating University Standards* https://scampus.usc.edu/1100-behavior-violating-university-standards-and-appropriate-sanctions/. Other forms of academic dishonesty are equally unacceptable. See additional information in *SCampus* and university policies on scientific misconduct, http://policy.usc.edu/scientific-misconduct/.

Discrimination, sexual assault, and harassment are not tolerated by the university. You are encouraged to report any incidents to the *Office of Equity and Diversity* http://equity.usc.edu/ or to the *Department of Public Safety* http://capsnet.usc.edu/department/department-public-safety/online-forms/contact-us. This is important for the safety whole USC community. Another member of the university community – such as a friend, classmate, advisor, or faculty member – can help initiate the report, or can initiate the report on behalf of another person. *The Center for Women and Men* http://www.usc.edu/student-affairs/cwm/ provides 24/7 confidential support, and the sexual assault resource center webpage sarc@usc.edu describes reporting options and other resources.

Support Systems
A number of USC's schools provide support for students who need help with scholarly writing. Check with your advisor or program staff to find out more. Students whose primary language is not English should check with the *American Language Institute* http://dornsife.usc.edu/ali, which sponsors courses and workshops specifically for international graduate students. *The Office of Disability Services and Programs* http://sait.usc.edu/academicsupport/centerprograms/dsp/home_index.htmlprovides certification for students with disabilities and helps arrange the relevant accommodations. If an officially declared emergency makes travel to campus infeasible, *USC Emergency Information* *http://emergency.usc.edu/*will provide safety and other updates, including ways in which instruction will be continued by means of blackboard, teleconferencing, and other technology.

Grading and Correction of Grades
Excerpts for this section have been taken from the University Grading Handbook, located at htttp://www.usc.edu/dept/ARR/grades/gradinghandbook/index.html. Please see the link for more details on this and any other grading concerns.

A grade of Missing Grade (MG) "should only be assigned in unique or unusual situations... for those cases in which a student does not complete work for the course before the semester ends. All missing

grades must be resolved by the instructor through the Correction of Grade Process. One calendar year is allowed to resolve a MG. If an MG is not resolved [within] one year the grade is changed to [Unofficial Withdrawal] UW and will be calculated into the grade point average a zero grade points.

A grade of Incomplete (IN) "is assigned when work is not completed because of documented illness or other 'emergency' occurring after the twelfth week of the semester (or 12th week equivalency for any course scheduled for less than 15 weeks)."

Course Schedule:

Week 1: August 22, 24

Introduction. Course Objectives and Structure.

T&L, Ch. 1. Visions of the Future

Week 2: August 29, 31

The Economic Approach: Property Rights, Externalities, and Environmental Problems

T&L, Ch. 2

Eve Bachrach , "Huge LA River Restoration Report Recommends $453MM Plan," Curbed Los Angeles, September 13th, 2013

Trieu Mai, Ryan Wiser, *et al*. "A Prospective Analysis of the Costs, Benefits, and Impacts of U.S. Renewable Portfolio Standards." A report by the National Renewable Energy Laboratory and the Lawrence Berkeley National Laboratory, December 2016.

"Los Angeles River Reconstruction," *The Los Angeles Times*, 2016

Week 3: September 5, 7

Evaluating Trade-Offs: Benefit-Cost Analysis and Other Decision-Making Metrics

T&L, Ch. 3

Hutton, G., & Menne, B. (2014). Economic evidence on the health impacts of climate change in Europe. *Environmental Health Insights*, 8, 43-52.

Brandt, S., Perez, L., Künzli, N., Lurmann, F., Wilson, J., Pastor, M., & McConnell, R. (2014). Cost of near-roadway and regional air pollution-attributable childhood asthma in Los Angeles County. *Journal of Allergy and Clinical Immunology*, 134(5), 1028-35.

Week 4: September 12, 14

Valuing the Environment: Methods

T&L, Ch. 4

Commonwealth of Australia. "The Benefits of Marine Protected Areas." Report. 2003

Case-Study: California High-Speed Rail Authority. "California High-Speed Rail Benefit-Cost Analysis (BCA)" Prepared by Parsons and Brinckerhoff. April 2012

Week 5: September 19, 21

Dynamic Efficiency and Sustainable Development.

T&L, Ch. 5, 8

Case-Study: Industrial Economics, Inc. "Final Report: Assessing the Economic Benefits of Reductions in Marine Debris: A Pilot Study of Beach Recreation in Orange County, California." Prepared for Marine Debris Division, National Oceanic and Atmospheric Administration, June 15, 2014.

Ai, N., PhD., & Leigh, Nancey Green,PhD., F.A.I.C.P. (2017). "Planning for Sustainable Material and Waste Management." Planning Advisory Service Report, (587), 1-98.

Week 6: September 26, 28

Midterm Exam 1 – Thu, September 28

Overpopulation

Warner, K., Hamza, M., Oliver-smith, A., Renaud, F., & Julca, A. (2010). Climate change, environmental degradation and migration. *Natural Hazards*, 55(3), 689-715.

Week 7: October 3, 5

Depletable Resource Allocation: The Role of Longer Time Horizons, Substitutes, and Extraction Cost.
Energy: The Transition from Depletable to Renewable Resources

T&L, Ch. 6 and 7

Parish, E. S., Kline, K. L., Dale, V. H., Efroymson, R. A., Mcbride, A. C., Johnson, T. L., Bielicki, J. M. (2013). Comparing scales of environmental effects from gasoline and ethanol production. Environmental Management, 51(2), 307-38.

Week 8: October 10, 12

Water: A Confluence of Renewable and Depletable Resources.

T&L, Ch. 9

Kevin DeGood, "Clean Water Infrastructure: The Cost of Inaction," Center for American Progress, October 30, 2013

Famiglietti, J. S. (2014). The global groundwater crisis. Nature Climate Change, 4(11), 945-948.

Week 9: October 17, 19

A Locationally Fixed, Multipurpose Resource: Land

T&L, Ch. 10

Burge, G. S., & Ihlanfeldt, K. R. (2013). Promoting sustainable land development patterns through impact fee programs. *Cityscape*, 15(1), 83-105.

Week 10: October 24, 26

Storable, Renewable Resources: Forests. Common-Pool Resources: Commercially Valuable Fisheries

T&L, Ch. 11 and 12

Pitcher, Tony and William W.L. Cheun. "Fisheries: Hope or despair?" *Marine Pollution Bulletin* 74 (2013) 506–516

Week 11: October 31, November 2

MIDTERM II – November 2, Thursday

Recyclable Resources: Minerals, Paper, Bottles, and E-Waste

T&L, Ch. 8

Warner, B. M. (2010). Sacking the culture of convenience: Regulating plastic shopping bags to prevent further environmental harm. *The University of Memphis Law Review*, 40(3), 645-680.

Week 12: November 7, 9

Economics of Pollution Control: An Overview. Stationary-Source Local and Regional Air Pollution

T&L, Ch. 14 and 15

Ma, Q., Cai, S., Wang, S., Zhao, B., Martin, R. V., Brauer, M., . . . Burnett, R. T. (2017). Impacts of coal burning on ambient pollution in China. *Atmospheric Chemistry and Physics*, 17(7), 4477-4491.

Week 13: November 14, 16

Mobile-Source Air Pollution. Water Pollution

T&L, Ch. 17 and 18

Drevno, A. (2016). Policy tools for agricultural nonpoint source water pollution control in the U.S. and E.U. *Management of Environmental Quality*, 27(2), 106-123.

Grahame, T. J., & Schlesinger, R. B. (2010). Cardiovascular health and particulate vehicular emissions: A critical evaluation of the evidence. *Air Quality, Atmosphere, & Health*, 3(1), 3-27.

Week 14: November 21

Research Paper is Due

Ecosystem Goods and Services: Nature's Threatened Bounty. Toxic Substances and Environmental Justice

T&L, Ch. 13 and 19

Bateman, I. J., Mace, G. M., Fezzi, C., Atkinson, G., & Turner, K. (2011). Economic analysis for ecosystem service assessments. *Environmental and Resource Economics*, 48(2), 177-218.

Week 15: November 28, 30

Climate Change. The Quest for Sustainable Development. Visions of the Future Revisited

T&L, Ch. 16, 20, and 21

"Transforming our world: the 2030 Agenda for Sustainable Development." Resolution adopted by the General Assembly. United Nations. 25 September 2015

FINAL EXAM: Tuesday, December 12 from 11 a.m.-1 p.m. (the usual location of our lectures – WPH 207)