AREC/ECON 540: Natural Resource Economics
Department of Agricultural and Resource Economics
Colorado State University
T-TH, 12:30-1:45, Eddy 106
Spring 2020

Course Syllabus

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OH: 11:30am-12:30 Mondays, 2-3 Tuesdays, or any time by appointment
Final Exam: take-home, due by Monday, 5/11, by 2pm.

NOTE: I will be taking family leave around the middle of April. This will not affect class assignments or expectations. Professor Stephan Kroll will ensure that the course continues as planned.

Course Description

This course is a second-year master's class that will make use of micro-economic theory and mathematical modeling tools to develop a rigorous understanding of the connection between human economic behavior and the natural environment. We will use mathematical techniques, including optimization tools, to examine problems related to pollution, environmental valuation, climate change, and the use of scarce natural resources over space and time. Concepts and mathematical tools introduced in AREC 540 will be further developed in AREC 740 (resource econ) and AREC 741 (environmental econ).

Course Objectives

My goal is to expose students to the major environmental and natural resource economics models while emphasizing the concepts and intuition of the models. Students should be able to extend these basic models to a wide variety of topics that we will not have time to cover in this class. I use class time to provide examples of applying economic theory to environmental and natural resource issues. If successful, these examples can inform model development for a master's thesis.

Prerequisites

I will assume everyone has taken a graduate level economics course and is comfortable with differential calculus and the basics of static optimization.

Recommended Texts and Readings

For this class, I will use the Perman et al. 4th edition textbook:

Perman, Roger, Yue Ma, Michael Common, David Maddison, and James McGilvray. *Natural Resource and Environmental Economics.* Prentice Hall; 4 edition (June 23, 2012)

This textbook provides a foundation but most of the reading in the class will come from journal articles posted online. The relevant references are listed in the topics below. I will use Canvas to share files, including readings and assignments.

Grading

Grades will come from a mid-term (15%), a final (20%), homework assignments (25%), a paper proposal (outline (10%) and final (10%), including presentation (5%)), and participation (5%). Finally, each student will lead a discussion of a paper that we cover in class (10%). The mid-term will be in class and the final, a take-home, will be due the afternoon of the scheduled exam day. There will be ~5 homework assignments and I will provide approximately 2 weeks per homework. You can collaborate on homework and turn in one problem set per 3 people but exams must be done entirely independently. I encourage you to come to me for help on homework as well. I will not accept late work.

I will give grades based on a percentage score but use a curve to ensure that the average grade is approximately a B+.

Class Topic Outline (subject to change)

Topic	***Readings***	***Important Dates***	***Perman Chapter(s)***
I. Course Introduction			
Course overview	Barbier2020 FullertonStavins1998 Tierney1990		
2. Natural Resource Economics			
Land: rents, scarcity, and land use	SchlenkerHanemannFisher2006 WuPlatinga2003 Angelsen2010		
Tragedy of the Commons: and institutions to correct	Gordon1954 Ostrom2002 Coase1960 Homans and Wilen 1997 AntinoriRausser2007 Jardinetal2014		
Forestry: Optimal timing	Hartman1976 McDermott2015		18
Nonrenewable Resources: sustainability and the optimal use over time	Hotelling1931 Barbier2016 SinnGreenParadox Andersonetal2018		15

Renewable Resources— The Fishery: Maximum economic yield Population models	Bromley2015 Costelloetal2016 Kroetzetal2017		17
Development and the environment: resource management and income	Samuelson 1974 Manningetal2016 JacobsenParker2014		
Empirical NR economics	CH 2 The Experimental Ideal Allcott2011 Novan2011 Smithetal2017 DrysdaleHendrix2018 PfaffRobalino2017 FerraroPrice2013	Spring Break: No Class 3/17 and 3/19	
3. Environmental Economics			
Introduction to environmental economics	Pierce2002	Midterm Exam (in class): 3/26	
Externalities			
Public goods			
Policies to correct market failures	GoulderParry 2008 Gillinghametal2013 SchmalenseeStavins2013 Walker2013 Hornbeck2010 Weitzman1974 Banzhafetal2019	Proposal outline due 4/1	5-7
Benefit-cost analysis			11
Environmental Valuation: revealed and stated preferences	Muehlenbachsetal2015 Johnstonetal2017		12
General equilibrium considerations	CarboneSmith2008 Cherniwchanetal2017		4,8, 10
Development and the environment: ecosystem services	Ferraroetal2012 Alix-Garciaetal2012 Andametal2010		
4. Climate change economics and the social cost of carbon	Weitzman2011 Kotchen2018 Klenertetal2018 WSJ2019 Stiglitz2019		9
Student Presentations		4/30, 5/5, and 5/7: present proposals	

Final Exam		Take-home, due May 11th by 2pm	