

## ADVANCED ENVIRONMENTAL AND RESOURCE ECONOMICS

AREC 440  
MWF 10:00 – 10:50am

Spring 2018  
Eddy 8

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**Instructor:** Jordan Suter

**E-mail:** jordan.suter@colostate.edu

**Office Hours (B-306 Clark):** Tues. 2–3pm, Thurs. 10– 11am and by appointment

### **Description:**

This course uses microeconomic techniques to rigorously explore decision-making and policy applied to environmental and natural resource problems. Specifically, the course will focus on economic issues related to the development of effective policy for managing open space land, water resources, energy development and climate. The course will involve a focus on solving analytical problems in the field, critical thinking as it pertains to the development of policy, and research on the tradeoffs associated with solutions to challenging environmental and natural resource problems.

**Learning Outcomes** (the underlined text comes from DARE's stated student learning objectives):

- (1) Refine problem-solving skills by critically assessing the economic and distributional impacts of competing policies aimed at addressing environmental and natural resource challenges.
- (2) Enhance technical competence by applying analytical, empirical, and computational tools to rigorously analyze research questions related to natural resource management.
- (3) Engage in professional development by interacting directly with practitioners working in the primary course content areas (land use, water, and energy/climate).
- (4) Build communication and leadership skills by working on group projects in the three course content areas, each of which culminate in a written report and presentation.

### **Readings:**

The readings will come from content made available through Canvas. The readings that are required for a given class are indicated in the course schedule and will be announced in class. All documents, including the course schedule, problem sets, and exams will be posted on Canvas.

### **Grading** (out of 100%):

Problem sets (15%) – You will be given one week to complete each problem set. You are allowed to work on the assignment with one other student. If you choose to work with another student, *please turn in one assignment* with each of your names at the top. I expect each individual to fully understand all solutions provided. Problem sets are due at the beginning of class and late assignments will be assessed a 10 point reduction for each day that they are late. Late assignments will not be accepted once I have provided the solutions.

Group projects (30%) – You will have three opportunities to work in groups during the semester, coinciding with the primary subject areas covered in the course. Groups will be shuffled for each assignment so that you work with different class members. For each project, groups will be asked to turn in a report of their work. In addition, groups will present their results to the class. Information about the specific assignments will be provided two weeks in advance of when each project is due.

Two midterm exams (25%) – Exams include short answer and essay questions related to problem sets, readings and lectures. If you have a medical excuse or family emergency and cannot attend an exam, you must let me know at least 48 hours in advance and provide proper documentation.

Final exam (25%) – The final exam will be comprehensive and feature short answer and essay questions. The exam will take place during the exam period.

Participation (5%) – I expect students to attend every class having completed the assigned readings and prepared to contribute. Your participation in all class discussions is valued.

Final grades will be based out of 100 percent, weighted according to the values given above. Letter grades will be assigned using the following scale: A (100 – 90), B (89 – 80), C (79 – 70), D (69 – 60), F (59 and below). Pluses and minuses are possible for each letter grade of C and higher, and are awarded based on B+ (89 – 87), B (86 – 83), B- (82 – 80), etc.

### **Academic Integrity:**

This course will adhere to the Academic Integrity Policy of the CSU General Catalog and the Student Conduct Code. I expect all work to be your own. Cases of plagiarism in written work will be taken seriously, so please familiarize yourself with CSU's guide to avoiding plagiarism (<http://writing.colostate.edu/guides/researchsources/understandingplagiarism/plagiarismoverview.cfm>).

### **Expectations and Feedback:**

I expect students to attend every class having done the assigned readings and prepared to contribute. It is also my expectation that you will be open-minded and considerate of the thoughts and ideas of all of your fellow classmates. In return, I will strive to conduct organized and insightful class sessions and to treat your intellectual work with fairness and impartiality.

### **Documented Disabilities:**

If you have a documented disability and wish to discuss academic accommodations, please contact me as soon as possible to set up the appropriate arrangements. Please do not wait until the day before an exam to request accommodations. Further information - <http://rds.colostate.edu/students>

### **Principles of Community:**

The Principles of Community support the Colorado State University mission and vision of access, research, teaching, service and engagement. A collaborative and vibrant community is a foundation for learning, critical inquiry, and discovery. Therefore, each member of the CSU community has a responsibility to uphold these principles when engaging with one another.

#### **Inclusion:**

We create and nurture inclusive environments and welcome, value and affirm all members of our community, including their various identities, skills, ideas, talents, and contributions.

#### **Integrity:**

We are accountable for our actions and will act ethically and honestly in all our interactions.

#### **Respect:**

We honor the inherent dignity of all people within an environment where we are committed to freedom of expression, critical discourse, and the advancement of knowledge.

#### **Service:**

We are responsible, individually and collectively, to give of our time, talents, and resources to promote the well-being of each other and the development of our local, regional, and global communities.

#### **Social Justice:**

We have the right to be treated and the responsibility to treat others with fairness and equity, the duty to challenge prejudice, and to uphold the laws, policies and procedures that promote justice in all respects.

## **Need Help?**

CSU is a community that cares for you. If you are struggling with drugs or alcohol and/or experiencing depression, anxiety, overwhelming stress or thoughts of hurting yourself or others please know there is help available. Counseling Services has trained professionals who can help. Contact 970.491.6053 or go to <http://health.colostate.edu>. If you are concerned about a friend or peer, tell someone at by calling 970.491.1350 to discuss your concerns with a professional who can discreetly connect the distressed individual with the proper resources (<http://supportandsafety.colostate.edu/tellsomeone>). Reach out and ask for help if you or someone you know is having a difficult time.

## **Sexual Assault and Violence Elimination:**

CSU's Student Sexual Harassment and Violence policy, following national guidance from the Office of Civil Rights, requires that professors follow CSU policy as a "mandatory reporter" of any personal disclosure of sexual harassment, abuse, and/or violence related experiences or incidents shared with the professor in person, via email, and/or in classroom papers or homework exercises. These disclosures include but are not limited to reports of personal relational abuse, relational/domestic violence, and stalking. While professors are often able to help students locate appropriate channels of assistance on campus, disclosure by the student to the professor requires that the professor inform appropriate CSU channels to help ensure that the student's safety and welfare is being addressed, even if the student requests that the disclosure not be shared.

For counseling support and assistance, please see The CSU Health Network, which includes a variety of counseling services that can be accessed at: <http://www.health.colostate.edu/>. And, The Sexual Assault Victim Assistance Team is a confidential resource for students that does not have a reporting requirement and that can be of great help to students who have experienced sexual assault. The web address is <http://www.wgac.colostate.edu/need-help-support>.

## **Course Outline:**

### **I. Review of essential concepts**

- Optimization, externalities, public goods, discounting

### **II. Land use and policy**

- Spatial land use models (Ricardo, von Thunen), conservation on private land, public lands management at the National Forest Service

### **III. Water resource economics**

- Allocation of surface water, municipal water conservation, groundwater management

### **IV. Energy and climate change**

- Conventional and alternative energy production, energy demand and efficiency, policies for reducing greenhouse gas emissions, offsets, and adaptation

## Course Schedule:

Week	Topic	Assignments	Readings
Jan. 17-19	Background		Neilsen 2009
Jan. 22-26	Background	PS 1 (1/26)	Kolstad Ch. 4&5 82-109
Jan. 29-Feb. 2	Land		Hartwick & Olewiler Ch.3
Feb. 5-9	Land	Exam 1 (2/9)	Ribaudo 2017
Feb. 12-16	Land		Messer 2006
Feb. 19-23	Land	Report 1 (2/21), Pres. 1 (2/23)	Ferraro 2011
Feb. 26-Mar. 2*	Land	PS 2 (3/2)	Banzhaf 2017
Mar. 5-9	Water		H&O Ch. 3, Hanemann 2004
Mar. 12-16	<b>Break</b>		-
Mar. 19-23	Water		EDF 2016
Mar. 26-30	Water	PS 3 (3/30)	Wichman 2016
Apr. 2-6	Water	Report 2 (4/4), Pres. 2 (4/6)	Finley 2017
Apr. 9-13	Energy/Climate	Exam 2 (4/11)	Krupnick and Echarte 2017
Apr. 16-20	Energy/Climate		Gillingham et al. 2017
Apr. 23-27	Energy/Climate	PS 4 (4/27)	Newell et al. 2014
Apr. 30-May 4	Energy/Climate	Report 3(5/2), Pres. 3 (5/4)	Darmstadter 2015

\* Class the week of Feb 26<sup>th</sup> will be held at the US Forest Service, Rocky Mountain Research Station on Prospect Rd. with lectures by Dr. Travis Warziniack.

### Background

W. Neilsen 2009, "Must-have math tools for graduate study in economics"

C. Kolstad, Environmental Economics, Second Edition, 2011

### Land

J. Hartwick and N. Olewiler, The Economics of Natural Resource Use, Second Edition, 1998

M. Ribaudo 2017, "Conservation programs can accomplish more with less by improving cost-effectiveness"

K. Messer 2006, "The conservation benefits of cost-effective land acquisition"

P. Ferraro et al. 2011, "Conditions associated with protected area success in conservation and poverty reduction"

Banzhaf 2017, "'Conservation Reconsidered' turns 50: the environmental turn in natural resource economics"

### Water

M. Hanemann 2004, "The economic conception of water"

Environmental Defense Fund 2016, "Alternative water transfers in Colorado"

K. Wichman 2016, "Water conservation policies: prices vs. restrictions"

B. Finley 2017, "The water under Colorado's Eastern Plains is running dry as farmers keep irrigating "great American desert""

### Energy

A. Krupnick and I. Echarte 2017, "Economic impacts of unconventional oil and gas development"

K. Gillingham et al. 2017, "Motivating and evaluating energy efficiency policy"

R. Newell 2014, "Carbon markets past, present, and future"

J. Darmstadter 2015, "Adaptation: an essential, but lagging, part of global warming policy"