Science and Technology Policy
Syllabus for ENVS 5100
University of Colorado – Spring 2010

Roger A. Pielke, Jr., Professor
Mondays 12:00-2:30 PM
GUGG 201E

Course Homepage:
http://sciencepolicy.colorado.edu/students/envs_5100/

Office Hours: Mondays 10-11:30AM and by appointment
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phone)
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Overview and Purpose of the Course

The National Research Council posits that universities today “have a double duty:"

to educate and train not only those who will have careers in research, but
also those who will become entrepreneurs, managers, consultants, investors,
or policy makers. Universities also can play a more active role in helping
students to prepare for these roles.¹

And the American Association for the Advancement of Science observes that to
improving national science policy,

Above all, we in the research community must find ways to link R&D priority
decisions more effectively to societal goals without compromising scientific
excellence and the autonomy of individual researchers.²

To help fill this need, in 2003 the University of Colorado approved a new
educational program to prepare students pursuing graduate degrees for careers at
the intersection of science, technology and decision making. This course is the first
in a 3-course sequence within the Graduate Certificate Program in Science and
Technology Policy. It is also open to anyone else interested in learning about
science and technology policy.

¹ NRC, 1999. Capitalizing on Research in Science and Technology, Committee on Science, Engineering,
and Public Policy, National Academy Press. Quote from Chapter 5,
http://books.nap.edu/html/capital/chap5.html
² AAAS, 1998. A framework for federal science policy, Board of Directors, American Association for the
Graduate study provides students with an opportunity to gain expertise within a particular disciplinary or interdisciplinary specialty. Such expertise is essential to the processes of creating new knowledge and integrating existing knowledge to produce novel insights.

But society looks to experts to do more than conduct research and produce knowledge. Increasingly, society looks to experts to play a central role in securing the benefits of the nation’s investment in knowledge, while at the same time, helping to protect against the misuse or unintended consequences of science and technology. In short, society expects experts to play a central role in improving decision making in public, private and civic settings.

But society needs experts to do more than simply provide knowledge. Increasingly, experts must play a central role in helping society to secure the benefits of society’s investment in knowledge, and in helping to protect against the misuse or unintended consequences of knowledge. More specifically, the expert must do more than provide knowledge to the decision process from a distance; the expert must participate in the process to help ensure that good outcomes result.

Science and technology result in a broad range of impacts on society. The impacts can be positive, such as the advances in health care over the twentieth century, or they can be negative, such as in the prospect of a terrorist attack using biological agents. The impacts of science and technology on society depend on the decisions we make and decision processes we implement for the governance of science and technology. Given the central role played by science and technology in modern society it is critical to develop expertise at the interface of science, technology and decision making.

Society’s demand for more useful and more relevant research is a message that has been heard loud and clear by the scientific community, with resulting calls for an evolution of graduate education. For example, according to a report of the National Research Council, society today expects those with advanced graduate training, “to contribute to new debates on public policy, to improve our competitive position in global markets, to help to create high-value jobs, and to improve the education of citizens at many levels.”

But in this context, Chubin (2000) identified science and technology policy as an important area needing attention by educators.

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3 The National Research Council uses the following taxonomy to describe areas of graduate study: physical, mathematical sciences and engineering, life sciences, social sciences, law, journalism and humanities.

If we do not replenish a cadre of S&T-savvy analysts, anecdotes will dominate policy debates. While the science community mulls about the composition of its future workforce, it must also help produce the next generation of S&T policy analysts and politically conscious citizens. Between public policy/administration programs and "science and technology (S&T studies)" programs, there should be a diverse pool of potential analysts being trained and then connected, as a career choice, to the apparatus of federal policymaking.5

Yet, recognizing demand for improved connections of science and society and asserting its importance is not the same as meeting that demand. Michael Crow, President of Arizona State University, notes of the connections between science and decision making, “successful linkages between the two have been extremely difficult to forge.” He further observes

We devote very little intellectual energy toward improving our incomplete understanding of the science-policy interface and the institutions focusing on this interface. Our scientific and technical abilities far outstrip our decision making methods and ability to understand the relationship between science and its many outcomes.6

This course seeks to introduce students to science and technology policy research and as a result, set the stage for improved understandings of science and technology, and their broader outcomes in society.

Requirements of the Course

Seminar Format

The course is a seminar, which means that we each share responsibility for pedagogy. There are a considerable amount of readings in the course and consequently the course has been structured in a way to allow for sharing responsibility for learning. The formal requirements of the course include informal weekly one pagers, 3 weeks of student-led “book club” discussions, 2 major in-class projects, recommended attendance at several outside-class events and an individual term project.

Readings

There are a lot of readings for this class, and many more will be made available for those interested in pursuing issues further. All required articles will be made available either by email or from the course WWW site, and most in PDF or HTML format. Copies of required books will be available on reserve in the library.

There are 2 required books that we will read for the class:


Students will together decide on a third required book to be read and discussed in class. I suggest getting these online, and used books can be cheaper. Also there are certainly copies floating around from past classes that might be borrowed. If anyone requests it, I will be happy to place the books on reserve in the library.

**Guest Speakers**

As opportunities allow we may have a few guest speakers lined up. Please feel free to suggest speakers for the class.

**Weekly One Pagers**

Every week you are expected to turn in a one-page essay (there are a few exceptions, please see the assignment tracking table for details). The essay will be due every Thursday to be submitted via the course email list-serv:

envs5100@sciencepolicy.colorado.edu

You might consider addressing the following two items in your submission:

1. The most important thing I learned from the class discussion and/or readings was . . .
2. The thing I still don't understand is . . .

You are of course free to discuss any topic related to the class beyond these two questions as well.

The purpose of this exercise is to allow you an opportunity to discuss aspects of the readings, integrate other material with the week’s focus, or to raise questions about what was unclear or unanswered by the readings. A secondary purpose is to ensure that you have an opportunity to provide me with feedback on the readings and your progress/satisfaction in the course.
Periodic Assignments

There will be periodic assignments throughout the term. In particular there are two major class projects, one focused on budgeting and the other focused on scientific advice to policy makers.

Book club

Each of you will be asked to share responsibility for leading discussion for one of the three “book club” discussions. Since there are 3 books to be read that means that 1/3 of the class will lead each discussion. You are free to organize the class in whatever manner makes sense and you are free to add supplementary materials to the readings. Some ideas are preparation of “reader’s guides” to the week’s readings, role play, field trip, invited guest, lecture, questions posed for discussion, etc. You are free to assign a deliverable (e.g., short paper) to the class.

Outside Events

There are a wide range of science and technology policy events always going on in Boulder. This spring we will have a seminar series organized by the Center for Science and Technology Policy Research. I’d like you to attend 2 additional events outside of class, and encourage you provide a report back to the class on the event and its relationship to class themes. Hopefully, you’ll have a chance to attend more than two such events.

Individual Term Projects

You will be responsible for completing a semester-long project focused on preparing a literature review. The result is to be a paper. I will discuss the details further in class. I would like a 1 page description of your final project by February 15.

Grading

Your grade will be determined as based on an evaluation of your work performed with respect to all of the above.
### Assignment Tracking Table
This is provided to help you manage what is due when

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<thead>
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<th>DATE</th>
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<td>1. 11 January</td>
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<td>2. 18 January</td>
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<td>3. 25 January</td>
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<td>4. 1 February</td>
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<td>5. 8 February</td>
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<td>Budget Assignment Due in Class</td>
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<td>Final Project Proposal Due in Class</td>
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<td>11. 22 March</td>
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<td>Spring break</td>
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<td>12. 29 March</td>
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<td>13. 5 April</td>
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<td>14. 12 April</td>
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<td>Advisory Committee Group Assignment Due in Class</td>
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<td>15. 19 April</td>
<td>1-pager (4/22)</td>
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<td>16. 26 April</td>
<td>TERM PROJECTS DUE</td>
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Tentative Schedule and Readings

Week 1 – January 11 – Introduction, Overview

Welcome to the Class
Introductions
Overview of the Syllabus
Schedule

First Introduction to the Course Themes
What you should be reading on a regular basis

Week 2 – January 18 – No Class MLK Day!

Introduction to Course Themes

http://www.issues.org/25.4/sarewitz.html


J. Stilgoe, J. Wilsdon, and B. Wynne, 2005. The Public Value of Science, Or how to ensure that science really matters, DEMOS, London, UK,
http://www.demos.co.uk/catalogue/publicvalueofscience/

http://sciencepolicy.colorado.edu/admin/publication_files/2002.05.pdf

WEEKS 3-5 FEDERAL BUDGET UNIT

Week 3 – January 25 – Federal Budget Process I

Budget assignment handed out

AAAS REPORT XXXIV
RESEARCH AND DEVELOPMENT
FY 2010
http://www.aaas.org/spp/rd/rdreport2010/
Additional general readings on the budget:


Budget-related WWW sites:

http://www.cbo.gov/
http://www.whitehouse.gov/omb/
http://www.senate.gov/~budget/democratic/budprocess.html
http://www.whitehouse.gov/omb/budget/fy2010/
http://www.house.gov/budget/
http://www.house.gov/budget_democrats/
http://www.senate.gov/~budget/democratic/
http://www.senate.gov/~budget/republican/

Week 4 – February 1 – Federal Budget Process II

IN CLASS BUDGETING WORKSHOP

Week 5 – February 8 – Federal Budget Process III

Budget assignments due and discussion

Week 6 – February 15 – Book Club 1


Final Project Proposal Due in Class

Week 7 – February 22 -- Historical Perspectives on Science Policy


Polanyi, M., 1967. The Republic of Science, Minerva, 1: 54-73


http://www.ost.gov.uk/about_ost/Nature_Article_15_July_FINAL.pdf

Optional:


Week 8 – March 1 -- Book club 2

Reading TBD

Week 9 – March 8 – What are universities for?


**Week 10 – March 15 – Book Club 3**


**Week 11 – March 22**

**SPRING BREAK**

ENJOY!!

**WEEKS 13-14 UNIT ON SCIENCE ADVICE TO DECISION MAKERS**

**Week 12 – March 29 – Science Advice to Decision Makers**

**Assign science advisory project**


http://prq.sagepub.com/cgi/content/abstract/61/4/547

http://sciencepolicy.colorado.edu/admin/publication_files/resource-2719-2009.05.pdf

DEMOS, 2006. The Received Wisdom
http://www.demos.co.uk/files/receivedwisdom.pdf

Optional additional readings:


**Week 13 – April 5 – – In-class science advice workshop**

**Week 14 – April 12 – Science Advisory Committees presentations and debate**

**Week 15 – April 19 -- Course wrap up: Science and Technology Policy Research**


**Optional**


**Week 16 -- April 26 -- Final presentations**
University Syllabus Statements

If you qualify for accommodations because of a disability, please submit to me a letter from Disability Services in a timely manner so that your needs may be addressed. Disability Services determines accommodations based on documented disabilities. Contact: 303-492-8671, Willard 322, and www.Colorado.EDU/disabilityservices

Campus policy regarding religious observances requires that faculty make every effort to reasonably and fairly deal with all students who, because of religious obligations, have conflicts with scheduled exams, assignments or required attendance. In this class, {{insert your procedures here}} See full details at http://www.colorado.edu/policies/fac_relig.html

Students and faculty each have responsibility for maintaining an appropriate learning environment. Students who fail to adhere to such behavioral standards may be subject to discipline. Faculty have the professional responsibility to treat all students with understanding, dignity and respect, to guide classroom discussion and to set reasonable limits on the manner in which they and their students express opinions. Professional courtesy and sensitivity are especially important with respect to individuals and topics dealing with differences of race, culture, religion, politics, sexual orientation, gender variance, and nationalities. Class rosters are provided to the instructor with the student's legal name. I will gladly honor your request to address you by an alternate name or gender pronoun. Please advise me of this preference early in the semester so that I may make appropriate changes to my records. See polices at

http://www.colorado.edu/policies/classbehavior.html and at
http://www.colorado.edu/studentaffairs/judicialaffairs/code.html#student_code

The University of Colorado at Boulder policy on Discrimination and Harassment (http://www.colorado.edu/policies/discrimination.html), the University of Colorado policy on Sexual Harassment and the University of Colorado policy on Amorous Relationships applies to all students, staff and faculty. Any student, staff or faculty member who believes s/he has been the subject of discrimination or harassment based upon race, color, national origin, sex, age, disability, religion, sexual orientation, or veteran status should contact the Office of Discrimination and Harassment (ODH) at 303-492-2127 or the Office of Judicial Affairs at 303-492-5550. Information about the ODH and the campus resources available to assist individuals regarding discrimination or harassment can be obtained at http://www.colorado.edu/odh

All students of the University of Colorado at Boulder are responsible for knowing and adhering to the academic integrity policy of this institution. Violations of this policy may include: cheating, plagiarism, aid of academic dishonesty, fabrication, lying, bribery, and threatening behavior. All incidents of academic misconduct shall
be reported to the Honor Code Council (honor@colorado.edu; 303-725-2273). Students who are found to be in violation of the academic integrity policy will be subject to both academic sanctions from the faculty member and non-academic sanctions (including but not limited to university probation, suspension, or expulsion). Other information on the Honor Code can be found at http://www.colorado.edu/policies/honor.html and at http://www.colorado.edu/academics/honorcode/.