

HPS 0633
Science, Philosophy, and Public Policy
SYLLABUS AND SCHEDULE

Class times: Mon./Wed. 9:30-10:45am

Instructor: Zina Ward

zina.b.ward@pitt.edu

Office: 901M Cathedral of Learning

Office hours: Mon. 10:45-11:45am, Wed. 3-4pm, and by appointment

Course description: What is the role of science and scientific experts in the creation of public policy? And what part do policymakers have to play in shaping the direction of science? In this course we will use the tools of history and philosophy of science to examine the complex and sometimes fraught relationship between science and policy in democratic societies. In the first third of the course, we will consider how policy shapes science by discussing the allocation of scientific funding, the distinction between pure and applied science, and the challenges presented by dual-use dilemmas. In the remaining two-thirds of the course, we will focus on how science is brought to bear on policymaking. We will try to answer questions such as: what is the role of values in science? Should scientists participate in public policy debates? What responsibilities do science advisors have to the people they advise? Throughout the course we'll make use of several recent case studies related to climate science, public health, and seismology.

Class expectations: Students are expected to come to class prepared and ready to engage with the material! For this course, this means:

- (i) *reading the assigned readings ahead of time.* I have done my best to keep the readings to one article per class to give you time to read them carefully and critically. There are several sessions with multiple papers assigned, but this is only because the papers are each very short. You may need to read the more challenging papers twice to try to understand them before coming to class.
- (ii) *bringing a copy of the reading to class.* It is crucial that you have the text that we are discussing in front of you for each class. We will be doing some close readings, so you will frequently need to refer to particular passages or arguments. You may bring either an electronic or paper copy.
- (iii) *bringing paper and something to write with.* Sometimes I will ask you to write something to hand in to me. You may also want to take notes, and it has been shown that students who take notes with pen and paper retain more information than those who type! (See Mueller & Oppenheimer 2014, "The pen is mightier than the keyboard," in *Psychological Science*.)
- (iv) *being ready for discussion.* This class will be largely discussion-based, so as you are reading, it's highly recommended that you write notes to yourself about things that you don't understand or that you disagree with.

Readings: There are no required textbooks for this course. All of the readings are posted to CourseWeb under the "Readings" file. There are several optional books that you are encouraged to read if you are especially interested in a particular topic. We will be reading parts of two of these books during the course, but I have posted pdfs of the relevant sections, so you do not have to buy them. The schedule of readings is at the very end of this syllabus.

A Tapestry of Values: An Introduction to Values in Science (Kevin Elliott, 2016)
Frontiers of Illusion: Science, Technology, and the Politics of Progress (Daniel Sarewitz, 1996)
The Honest Broker: Making Sense of Science in Policy and Politics (Roger A. Pielke, Jr., 2003)

Office hours: My office hours are times when I will be in my office to answer questions, discuss topics that especially interest you, or help you with assignments. In normal circumstances, I will not read drafts of your papers, but I would be happy to discuss them or help you make an outline.

Grading: Your grade for the course will reflect the following components.

Mid-semester papers	60%
Participation	10%
Final paper	30%
Attendance	see below

Mid-semester papers: One of the main aims of this course is to help you learn to write more clearly and effectively. Writing is a skill that you can develop with practice, so no matter where you are starting from, I hope that you will be a better writer at the end of this course than at the beginning. To give you practice, and to prepare you for the final paper, you will have four short (2.5-3-page) papers over the course of the semester. Each consecutive assignment will be worth more, giving you a chance to make mistakes and learn what a good paper looks like. I will present my expectations for these papers in more detail on the second day of class (Wednesday, 8/30).

Your papers must be submitted to CourseWeb on Fridays *by 5pm*. (I will print them out before going home, so 5pm is a hard deadline.) Please send them in .doc or .pdf format. If you miss a deadline for a given paper, your grade will be reduced by 10% for each day late.

Paper 1	due 9/15	worth 12%
Paper 2	due 10/6	worth 14%
Paper 3	due 10/27	worth 16%
Paper 4	due 11/17	worth 18%

Your papers can be about any of the texts that we have read since the last paper was due. This means that the acceptable topics/readings for each paper include the following:

Paper 1	pure/applied science, science funding (readings 8/30-9/13)
Paper 2	scientific accountability, dual-use dilemmas (readings 9/18-10/4)
Paper 3	values in science, values and science advising (readings 10/10-10/25)
Paper 4	uncertainty, responsibilities of advisors, technocracy (10/30-11/15)

Participation: Participation will be assessed with a variety of small-group activities and in-class assignments. These will be graded on a check / check-plus / check-minus scale.

Final paper: For your final paper, I will ask you to find a piece of writing related to a current “science for policy” or “policy for science” issue and to analyze it in light of what we have discussed over the course of the semester. The text that you choose can be a news article, a speech by a politician, a press release by an advocacy organization, or something else. My hope is that it will concern a science/policy topic that is important to you. You will then write a paper critiquing the text by reference to one or more of the articles that we have read this term. There will be a proposal for the paper due two weeks in advance specifying the text you have chosen to critique, the papers you intend to draw from, and ideas for the thesis you will defend. I will give you more

details about this assignment later in the semester. In the meantime, be on the lookout for articles, speeches, or press releases that interest you and relate to themes that arise in the course.

Final paper proposal	due 12/1
Final paper	due 12/15

Attendance: You are expected to come to every class, barring family or medical emergency. I will give you three “freebies,” where you can miss class without penalty. After that, each unexcused absence will result in a 1% reduction in your final grade. If you have an emergency and will need to miss class, please bring a doctor’s note or send me an email, ideally in advance of class.

Anonymous grading: I will grade your papers anonymously. Please put your Peoplesoft number at the top *instead of* your name. The reason to grade anonymously is to eliminate the effects of implicit biases, which have been shown to plague a large majority of people, including those who do not hold explicitly prejudiced beliefs. For an introduction to implicit bias, take Project Implicit’s “Implicit Association Test” (<https://implicit.harvard.edu/implicit/>) or read the Stanford Encyclopedia of Philosophy’s article on it (<http://plato.stanford.edu/entries/implicit-bias/>).

Writing Center: Effective written communication is critical to philosophy and to academic discourse. You are strongly encouraged to trade drafts of your papers with your classmates for editing and to make use of the Writing Center:

412.624.6556
317B O’Hara Student Center
www.writingcenter.pitt.edu

Plagiarism: Students are expected to comply with the University policy on academic integrity. Any student suspected of violating this policy will be required to participate in the procedural process, as outlined in the University Guidelines on Academic Integrity (<http://www.pitt.edu/~provost/aii.html>). There will be no tolerance for plagiarism; any violation will result in a minimum sanction of a zero score on the assignment. If you have any questions about how to properly use, cite or paraphrase sources, I will be more than happy to help you.

Non-discrimination policy: The University of Pittsburgh, as an educational institution and as an employer, values equality of opportunity, human dignity, and racial/ethnic and cultural diversity. Accordingly, the University prohibits and will not engage in discrimination or harassment on the basis of race, color, religion, national origin, ancestry, sex, age, marital status, familial status, sexual orientation, gender identity and expression, genetic information, disability, or status as a veteran. The University also prohibits and will not engage in retaliation against any person who makes a claim of discrimination or harassment or who provides information in such an investigation. Further, the University will continue to take affirmative steps to support and advance these values consistent with the University’s mission.

Disability accommodation: If you have a disability for which you are or may be requesting an accommodation, you are encouraged to contact both me and Disability Resources and Services (<http://www.studentaffairs.pitt.edu/drswelcome>) at 412-648-7890 or 412-383-7355 (TTY) as early as possible in the term. DRS will verify your disability and determine reasonable accommodations for this course.

Reading Schedule

	Class day	Topic	Reading
PART 1: POLICY FOR SCIENCE			
M	Aug. 28	Introduction	----
W	Aug. 30	Pure vs. applied science I	Bridgman 1943, Stern 1944, and Robin 1944 (8 pages total)
M	Sept. 4	NO CLASS: LABOR DAY	----
W	Sept. 6	Pure vs. applied science II	Reagan 1967 and Stokes 1997 pp. 45-56 (16 pages total)
M	Sept. 11	Science funding I: history and rationale	Bush 1945 pp. 1-34
W	Sept. 13	Science funding II: today	Kennedy 2012
M	Sept. 18	Science funding III: examining the linear model	Balconi et al. 2010
W	Sept. 20	Accountability of scientists I	Sarewitz 1996 ch. 4
M	Sept. 25	Accountability of scientists II: research priorities	Flory & Kitcher 2004
W	Sept. 27	Dual-use dilemmas in the life sciences I	Hunter 2012 and NPR radio story 1/7/16
M	Oct. 2	Dual-use dilemmas in the life sciences II	Miller & Selgelid 2007, pp. 1-26
W	Oct. 4	Dual-use dilemmas in the life sciences III	Miller & Selgelid 2007, pp. 27-51
M	Oct. 9	NO CLASS: FALL BREAK	----
PART 2: SCIENCE FOR POLICY			
Tu*	Oct. 10**	Values in science I	Rudner 1953
W	Oct. 11	Values in science II	Jeffrey 1956
M	Oct. 16	Values in science III	Longino 1990 (optional: Douglas 2000)
W	Oct. 18	Science for policy-making: introduction	Gluckman 2014 and EU Commission pp. 8-10 (6 pages total)
M	Oct. 23	Values and science advising I (case study: risk assessment)	Wandall 2004
W	Oct. 25	Values and science advising II (case study: risk assessment)	Haller & Gerrie 2007
M	Oct. 30	Uncertainty and science advising I	Elliott 2017 pp. 83-92

W	Nov. 1	Uncertainty and science advising II (case study: climate)	Hansen 2007 and Ball 2007 (8 pages total)
M	Nov. 6	Uncertainty and science advising III (case study: climate)	Brysse et al. 2012
W	Nov. 8	Responsibilities of science advisors I (case study: l'Aquila)	Hall 2011
M	Nov. 13	Responsibilities of science advisors II (case study: l'Aquila)	Yeo 2014
W	Nov. 15	Technocracy I	Nelkin 1979
M	Nov. 20	Technocracy II: science and public debate	Sarewitz 2000
W	Nov. 22	NO CLASS: THANKSGIVING	----
M	Nov. 27	Technocracy III: science and public debate	Sarewitz 2004
W	Nov. 29	Participatory science I	Douglas 2005
M	Dec. 4	Participatory science II (case study: WWV/biodiversity)	World Wide Views Biodiversity booklet
W	Dec. 6	Participatory science III	Bovenkerk & Brom 2012
	Dec. 11-16	FINAL EXAM PERIOD	

Detailed reading information

1. Policy for science

What is the difference between pure and applied science? Is one more valuable than the other? Does the distinction hold up to scrutiny?

- Bridgman, P. W. 1943. "Science, and its changing social environment." *Science (New York, N.Y.)* 97 (2511): 147–50.
- Stern, Alexander W. 1944. "The threat to pure science." *Science* 100 (2599): 356–356.
- Robin, E. V. 1944. "The threat to pure science." *Science (New York, N.Y.)* 100 (2606): 519–21.
- Reagan, Michael D. 1967. "Basic and Applied Research: A Meaningful Distinction?" *Science* 155 (3768): 1383–86.
- Stokes, Donald E. 1997. *Pasteur's Quadrant: Basic Science and Technological Innovation*. Washington, D.C: Brookings Institution Press. FOR CLASS: pp. 45-56.

What justifies government funding of science? What sort of research should the government support? Can the linear model of innovation be maintained?

- Bush, Vannevar. 1945. "Science the Endless Frontier." <https://www.nsf.gov/od/lpa/nsf50/vbush1945.htm>. FOR CLASS: pp. 1-34.
- Kennedy, Joseph V. 2012. "The Sources and Uses of U.S. Science Funding." *The New Atlantis*.
- Balconi, Margherita, Stefano Brusoni, and Luigi Orsenigo. 2010. "In Defence of the Linear Model: An Essay." *Research Policy* 39 (1): 1–13.

Should science be insulated from society? Are scientists accountable to the public? Do scientists have an obligation to pursue research topics of social importance?

- Sarewitz, Daniel. 1996. "Chapter 4: The Myth of Accountability." In *Frontiers Of Illusion: Science, Technology and the Politics of Progress*. Philadelphia: Temple University Press.
- Flory, James H., and Philip Kitcher. 2004. "Global Health and the Scientific Research Agenda." *Philosophy & Public Affairs* 32 (1): 36–65.

How should the dual-use dilemma in the life sciences be handled? Should pursuit and publication of dual-use research be subject to oversight? If so, who should exercise it?

- Hunter, Philip. 2012. "H5N1 Infects the Biosecurity Debate." *EMBO Reports* 13 (7): 604–7.
- Greenfield Boyce, Nell. 2017. "Debate Over Bird Flu Research Moratorium Flares Up Again." *NPR.org*. <http://www.npr.org/sections/health-shots/2016/01/07/462176973/debate-over-bird-flu-research-moratorium-flares-up-again>.
- Miller, Seumas, and Michael J. Selgelid. 2007. "Ethical and Philosophical Consideration of the Dual-Use Dilemma in the Biological Sciences." *Science and Engineering Ethics* 13 (4): 523–80.

2. Science for policy

What is the role of values in science? Do non-epistemic values play a role in the decision to accept or reject scientific claims? Can the value-free ideal for science be maintained?

- Rudner, Richard. 1953. "The Scientist Qua Scientist Makes Value Judgments." *Philosophy of Science* 20 (1): 1–6.
- Jeffrey, Richard C. 1956. "Valuation and Acceptance of Scientific Hypotheses." *Philosophy of Science* 23 (3): 237–46.
- Longino, Helen E. 1990. *Science as Social Knowledge*. First Paperback Edition. Princeton: Princeton University Press. FOR CLASS: chapter 4.

What is the role of values in science advising? What attitude toward non-epistemic values should science advisors adopt?

- Gluckman, Peter. 2014. "Policy: The Art of Science Advice to Government." *Nature News* 507 (7491): 163.
- "Strengthening Evidence Based Policy Making Through Scientific Advice." 2015. European Commission. FOR CLASS: pp. 8-10.
- Wandall, Birgitte. 2004. "Values in Science and Risk Assessment." *Toxicology Letters* 152 (3): 265-72.
- Haller, Stephen F., and James Gerrie. 2007. "The Role of Science in Public Policy: Higher Reason, or Reason for Hire?" *Journal of Agricultural and Environmental Ethics* 20 (2): 139-65.

How should science advisors handle scientific uncertainty in their interactions with policy-makers? What are the advantages and disadvantages of different approaches to uncertainty?

- Elliott, Kevin C. 2017. *A Tapestry of Values: An Introduction to Values in Science*. Oxford, New York: Oxford University Press. FOR CLASS: pp. 80-92.
- Hansen, J. E. 2007. "Scientific Reticence and Sea Level Rise." *Environmental Research Letters* 2 (2): 1-6.
- Ball, Philip. 2007. "When It's Right to Be Reticent." *Nature News*, March.
- Brysse, Keynyn, Naomi Oreskes, Jessica O'Reilly, and Michael Oppenheimer. 2013. "Climate Change Prediction: Erring on the Side of Least Drama?" *Global Environmental Change* 23 (1): 327-37.

What moral responsibilities do science advisors have to the governments and publics they advise? What legal obligations do and should they have?

- Hall, Stephen S. 2011. "Scientists on Trial: At Fault?" *Nature News* 477 (7364): 264-69.
- Yeo, Michael. 2014. "Fault Lines at the Interface of Science and Policy: Interpretative Responses to the Trial of Scientists in L'Aquila." *Earth-Science Reviews* 139 (December): 406-19.

Can and should science be used to resolve public policy debates? Is policy-makers' increasing reliance on science advisors in tension with democratic principles?

- Nelkin, Dorothy. 1979. "Scientific Knowledge, Public Policy, and Democracy: A Review Essay." *Knowledge* 1 (1): 106-22.
- Sarewitz, Daniel. 2000. "Science and Environmental Policy: An Excess of Objectivity." In *Earth Matters: The Earth Sciences, Philosophy, and the Claims of Community*, edited by Robert Frodeman and Victor R. Baker, 79-98. Prentice-Hall.
- Sarewitz, Daniel. 2004. "How Science Makes Environmental Controversies Worse." *Environmental Science & Policy*, Science, Policy, and Politics: Learning from Controversy Over The Skeptical Environmentalist, 7 (5): 385-403.

Can public participation help to address potential problems at the boundary of science and policy? For instance, can it assuage worries about technocracy or the role of values in science?

- Douglas, Heather. 2005. "Inserting the Public Into Science." In *Democratization of Expertise?*, 153-69. Sociology of the Sciences Yearbook. Springer, Dordrecht.
- Schmidt, Markus, Helge Torgersen, and Astrid Kuffner. 2012. "World Wide Views on Biodiversity -- Information Material for Citizens." <http://biodiversity.wwviews.org/publications/>.
- Bovenkerk, B., and F. W. A. Brom. 2012. "World Wide Views on Global Warming: Evaluation of a Public Debate." In *Climate Change and Sustainable Development*, 95-99. Wageningen Academic Publishers, Wageningen.