

**RES 500D: Expertise under fire - Navigating the divide between scientific practice and science studies**

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**Day/Time:** Tuesdays 2:00-17:00pm WT1 2022/23

**Location:** TBD

**Enrollment**

- Graduate students in the natural or social sciences
- Graduate students in the humanities studying scientific practices (*e.g.*, philosophy, history, sociology of science, STS)
- Advanced undergraduates with instructor approval and completed G+PS form

**Description**

For natural and social science students, the aim of this course is to grapple with the role of value-judgements in science and how it is played out in their own field of research

For humanities students studying the scientific enterprise, the aim is to grapple with the communication barrier between science studies and the scientific practice.

Through the use of historic and contemporary cases, students will work in mixed groups to jointly seek ways to navigate the divide between the two communities.

**Background**

Many policy-relevant decisions depend on expert advice, but experts often disagree, particularly in complex, socially relevant areas where science is uncertain. It is well documented that scholarly experts on opposite sides of a policy-relevant controversy commonly perceive the other side as biased but see themselves as objective. More data and rigorous analysis rarely resolve such conflicts, yet the expectation is that it is possible to reach consensus. This expectation hinges on the idea that the scientific enterprise is free of values and that science is a deliverer of irrefutable facts. Value-judgements are, however, not only unavoidable but also a necessary component of rigorous research, particularly in areas defined by uncertainty (known unknowns) and ignorance (unknown unknowns), which commonly is the case in complex fields such as health, environment, communication, safety and planning.

Value-judgements are a necessary part of rigorous science because 100% certainty will never reign. Researchers will need to decide how much evidence --- and what type --- that is needed to draw a conclusion, and an inductive leap must be made from evidence to conclusion. Consensus is therefore not always possible and probably not even desirable. Yet, little is known about how to sensibly navigate this terrain.

While science studies scholars have demonstrated beyond doubt that value-judgements are an integral part of science, most scientists define 'good' science as objective and value-free in part because few scientists are familiar with these findings and in part because of a wide-spread distrust among scientists about claims made by philosophers. Even so, philosophy of science education rarely includes questions related to communication obstacles between practitioners

of the natural and social sciences and science studies scholars. In this course, students will grapple with this double challenge.

*Half the class is seminar/lecture and half workshop.*

<i>Date</i>	<i>Class</i>	<i>Literature</i>
Sept 13	Introduction	
Sept 20	Your perception of what science is and how it is done	Collins and Pinch, 2012; Öberg and Campbell, 2019
Sept 27	Bias, values and the role of framing	Halfman, 2018
Oct 4	Epistemic values	Elliot, 2017; Douglas, 2015
Oct 11	Thought collectives, paradigms and epistemic cultures	Fleck 1936/1986; Vera et al., 2020
Oct 18	Science for policy  Case study methods	Jasanoff 2007; Mc Gregor et al., 2020;  Öberg 2011
Oct 25	Case Study Aim and Methods draft  On vocabulary	Schön, 2002
Nov 1	Legitimate and illegitimate values: is it possible to distinguish between corrupt, faulty, unconsciously biased research from research that is impacted by legitimate values?	de Melo Martin & Intemann, 2018
Nov 8	Fall break – work on case studies😊	
Nov 15	Peer review of case study drafts	de Melo Martin & Intemann, 2018
Nov 22	Science and democracy	Collins & Evans 2020
Nov 29	Case study presentations	
Dec 6	Implications for my academic practice?	

## Literature

Collins, H. M. and T. Pinch (2012). “The golem: What you should know about science”, Cambridge University Press.

Collins, H., et al. (2020). Experts and the Will of the People, Springer.

de Melo-Martín, I. and K. Intemann (2018). “The Fight Against Doubt: How to Bridge the Gap Between Scientists and the Public”, Oxford University Press.

Douglas, H. (2015). “Values in Science.” The Oxford Handbook of Philosophy of Science.

Elliott, K. C. (2017). “A tapestry of values: an introduction to values in science”, Oxford University Press.

Fleck, L. (2012). “Genesis and development of a scientific fact”, University of Chicago Press.

Halffman, W. (2019). Frames: beyond facts versus values. Environmental expertise. Connecting science, policy, and society. E. Turnhout, W. Tuinstra and W. Halffman. Cambridge, UK, Cambridge University Press: 36-57.

Jasanoff, S. (2007). "Technologies of humility." Nature 450(7166): 33.

McGregor, D., et al. (2020). "Indigenous environmental justice and sustainability." Current Opinion in Environmental Sustainability 43: 35-40.

Öberg, G. (2011). Interdisciplinary environmental studies: A primer, John Wiley & Sons.

Öberg, G. and A. Campbell (2019). "Navigating the divide between scientific practice and science studies to support undergraduate teaching of epistemic knowledge." International Journal of Science Education 2: 230-247.

Schön, D., A. (2002). Generative metaphor: A perspective on problem-setting in social policy. Metaphor and thought. A. Ortony, Cambridge University Press: 137-163.

Vera, L. A., et al. (2019). "When data justice and environmental justice meet: formulating a response to extractive logic through environmental data justice." Information, Communication & Society 22(7): 1012-1028.