

Science and Technology Studies 201: *Where Science Meets Society*

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Office hours: W 12:00–2:00

Fall 2014
6112 Social Sciences Building
MW 2:30–3:45

What is science? What, if anything, is special about the way that scientists generate knowledge? In university courses, we absorb many implicit rules about what makes for good scientific work—lab reports should be written in the third person, papers must have citations (but not to Wikipedia!), double-blind studies are better than anecdotal evidence—but rarely do we have the opportunity to reflect on why it is that we are taught to know in this way. This course identifies and challenges common (but often unstated) assumptions about what science is and how it works, with the aim of revealing the deep connections between science and technology and our social, cultural, economic, and political lives. The first unit introduces students to central ideas in Science and Technology Studies (STS), a field that uses perspectives from the humanities and social sciences to analyze the dynamics of knowledge production. Through discussions of key concepts and case studies, we will explore how particular scientific facts or technologies become accepted, how controversies are settled, and how science and scientists retain credibility and authority. Unit two examines how science, technology, and society evolve together. Broader questions such as whether scientific and technological advances can really be said to drive social change, whether the institutions and people producing scientific knowledge shape the form that the science takes, and who benefits from how research agendas or new technologies are designed are the focus of this section of the course. The final unit explores how societies can engage with contemporary science and technology. We will collectively choose several controversial current topics to explore in depth (such as stem cell research, digital media and copyright, or bioterrorism), and one of these topics will be the basis for an in-class exercise in participatory science policy decision-making.

As well as serving as a foundational course for students enrolled in the ISSuES certificate program (<http://www.sts.wisc.edu/education/ISSuES.html>), this course is aimed at students with

backgrounds in either the sciences or the humanities who are curious to think more critically about the interactions between of science, technology, and society. It allows students in science and engineering to reflect on their own experience doing scientific work and consider the impact and implications of their work for society, and students with backgrounds in the humanities and social sciences will develop a better understandings of the social dynamics of knowledge production and the role of science and technology in contemporary society. There are no prerequisites for this course.

Course Objectives

After successfully completing the course you will be able to:

- explain key concepts from the field of Science and Technology Studies and apply them to novel case studies;
- identify and reflect on your own assumptions about what science is and how it works, especially your assumptions about the relationship between science and society;
- analyze the dynamics of scientific controversies and formulate opinion on a controversial science or technology policy issue that goes beyond simply agreeing or disagreeing with one side;
- effectively express your opinions on scientific controversies in writing by employing rhetorical devices that convey authority and credibility to different audiences or in different settings;
- describe different models for public engagement with science and technology policy issues and compare their benefits and limitations;
- reflect on how scientific agendas or technological designs could be constructed differently with different societal aims in mind.

Course materials

There are two required texts for this course:

- Sergio Sismondo. 2010. *An introduction to science and technology studies*. 2nd ed. Chichester, U.K.: Wiley-Blackwell
- Harry M. Collins and Trevor J. Pinch. 1998. *The golem at large: what you should know about technology*. Cambridge: Cambridge University Press

Both of these texts are available for purchase at the University Book Store (711 State St). Additional course readings will be available for purchase as a course pack at the Social Science Copy Center (6120 Social Science Building, 1180 Observatory Drive). Copies of the textbooks (where available) and the course pack will also be on reserve at College Library (in Helen C. White Hall).

Assignments and grading

<i>Assignment</i>	<i>% of final grade</i>	<i>Due date</i>
Discussion participation	15%	throughout full term
Rhetoric in science assignment	15%	September 29
Controversy case study	25%	October 22
Consensus conference	20%	November 26
Take-home final <i>or</i> term paper	25%	to be announced

Discussion participation Your participation grade will be based on your attendance, preparation for class, and the quality of your participation in class discussions and in-class exercises. Students are expected to arrive in class having read the assigned readings for that day and ready to participate in discussion or other in class activities. A detailed rubric outlining expectations for discussion participation will be distributed in class, and you will receive interim feedback on your discussion participation midway through the semester.

Rhetoric in science assignment In this assignment, you will write two short pieces on same topic in different writing styles—one in the form of a scientific report, and the other in the form of an opinion piece. The aim of this assignment is to explore how rhetorical choices create different forms authority and credibility in scientific writing, and to gain a greater awareness of how you use rhetorical devices in your own writing. Instructions and a grading rubric for this assignment will be distributed in class.

Controversy case study This assignment asks you to take a current scientific, medical, or technological controversy of your choosing and analyze it using the concepts learned so far in class. Applying the analytical tools you have acquired to a current case will help you both in making sure you understand key course concepts, and in formulating well-supported opinions on controversial science policy or ethics questions. Instructions and a grading rubric for this assignment will be distributed in class.

Consensus conference In this assignment, we will conduct a mock “consensus conference” to debate a science or technology policy issue of the students’ choosing in class. You will have the option of choosing various roles in this exercise (for example, citizen, politician, or scientific expert). The specific expectations for this assignment will depend on the role you choose, but all roles will involve an oral and a written component. More details on this assignment and the grading rubric will be distributed in class, and in class time will also be allocated for preparation in the weeks leading up the conference.

Take-home final exam The final exam is a take-home assignment where you will choose three of four short essay questions to write on, using course readings as your sources. The take home essay prompts and the grading rubric will be distributed and discussed on the final course meeting. You also have the option of writing a term paper equivalent in length to the take home final on a topic of your choosing

instead of writing the exam. If you wish to take this option, you must meet with me to discuss and approve your proposed paper topic by the end of unit two (November 14).

Grading All assignments will be given a percentage score, and these scores will be used to calculate your final letter grade. If you have any questions or concerns about the grading for a particular assignment, please discuss it with me within three weeks of receiving your graded assignment. The scale used for converting percentages to letter grades is as follows:

A = 93.0–100%, AB = 88.0–92.9%, B = 83.0–87.9%, BC = 78.0–82.9%, C = 70.0–77.9%, D = 60.0–69.9%
F = 0–59.9%

Course policies

Attendance You are allowed one unexcused (no questions asked) absence in the course; after that any unexcused absences will count against your discussion participation grade. For absences due to illness, family emergencies, scheduled conflicts, or other legitimate reasons, you can make up the missed participation grades by handing in a 250 word informal reading response instead of attending class. You must contact me in advance of the missed class (except in exceptional circumstances) to clear your absence with me and agree on a due date for your reading response.

Students with disabilities I am happy to discuss academic accommodations for students with disabilities. If you think you may qualify for accommodation, please contact the McBurney Disability Resource Center to establish your eligibility for services. If you already have a McBurney visa, you should present it to me within the first three weeks of the semester so that appropriate arrangements can be made, unless there are unusual circumstances.

Academic Integrity All students are expected to adhere to the University of Wisconsin—Madison's core values regarding academic integrity. Plagiarism or other academic misconduct may result in a zero on the assignment or exam, a lower grade in the course, or failure in the course. See the Dean of Students Office website for more information about the academic misconduct process (<http://students.wisc.edu/doso/acadintegrity.html>).

Course Schedule

Week 1: Introduction

September 3

No readings

Unit 1: What is science?

Week 2: Defining science and scientific knowing

September 8

- Harry M. Collins and Trevor J. Pinch. 1979. "The construction of the paranormal: nothing unscientific is happening." In *On the margins of science: the social construction of rejected knowledge*, edited by Roy Wallis, 237–270. Keele: University of Keele

September 10

- Sergio Sismondo. 2010. *An introduction to science and technology studies*. 2nd ed. Chichester, U.K.: Wiley-Blackwell, p. 1–11 ("Prehistory of Science and Technology Studies")

Week 3: Seeing is believing

September 15

- Harry M. Collins and Trevor J. Pinch. 1998. *The golem at large: what you should know about technology*. Cambridge: Cambridge University Press, p. 57–77 ("The Sun in a Test Tube: The Story of Cold Fusion")

September 17

- Sismondo 2010, p. 120–135 ("Controversies")

Week 4: Scientific rhetoric

September 22

- P. B. Medawar. 1964. "Is the scientific paper fraudulent?" *The Saturday Review* (August 1): 42–43. <http://www.unz.org/Pub/SaturdayRev-1964aug01-00042>
- Sismondo 2010, p. 148–156 ("Rhetoric and Discourse")
- Assignment will be distributed

September 24

- Thomas F. Gieryn. 1983. "Boundary-work and the demarcation of science from non-science: strains and interests in professional ideologies of scientists." *American Sociological Review* 48 (6): 781–795. <http://www.jstor.org/stable/2095325>

Week 5: Making scientific knowledge convincing

September 29

- Steven Shapin. 1995. "Trust, honesty, and the authority of science." In *Society's choices social and ethical decision making in biomedicine*, edited by Ruth Ellen Bulger, Elizabeth Meyer Bobby, and Harvey V Fineberg, 388–408. Washington, D.C.: National Academy Press
- Assignment due

October 1

- Tom F. Gieryn. 2002. "Three truth-spots." *Journal of the History of the Behavioral Sciences* 38 (2): 113–132. doi:10.1002/jhbs.10036

Week 6: Challenging scientific facts

October 6

- Ole Bjørn Rekdal. 2014. "Academic urban legends." *Social Studies of Science* 44 (4): 638–654. doi:10.1177/0306312714535679

October 8

- Harry M. Collins. 1985. *Changing order: replication and induction in scientific practice*. London; Beverly Hills: Sage Publications, p. 51–78

Week 7: Science the pursuit of truth

October 13

- Mark Peter Jones. 2009. "Entrepreneurial science: the rules of the game." *Social Studies of Science* 39 (6): 821–851. doi:10.1177/0306312709104434
- Sismondo 2010, p. 23–35 ("Questioning Functionalism in the Sociology of Science")
- Assignment will be distributed

October 15

- Sismondo 2010, p. 57–71 ("The Social Construction of Scientific and Technical Realities")

Unit 2: What drives science and technology?

Progress and technological determinism

October 20

- Sismondo 2010, p. 93–105 ("Two Questions Concerning Technology")

- Marianne de Laet and Annemarie Mol. 2000. “The Zimbabwe bush pump: mechanics of a fluid technology.” *Social Studies of Science* 30 (2): 225–263. doi:10.1177/030631200030002002

October 22

- Movie: *Who Killed the Electric Car?*
- Assignment due

Week 9: Wrongdoing and risk

October 27

- Collins and Pinch 1998, p. 30-56 (“Assigning Blame for the Challenger Explosion”)

October 29

- Charles Perrow. 1981. “Normal accident at Three Mile Island.” *Society* 18 (5): 17–26. doi:10.1007/BF02701322
- Sara B. Pritchard. 2012. “An Envirotechnical Disaster: Nature, Technology, and Politics at Fukushima.” *Environmental History* 17 (2): 219–243. doi:10.1093/envhis/ems021

Gender and science

November 3

- Sismondo 2010, p. 36–46 (“Stratification and Discrimination”)
- Ben A. Barres. 2006. “Does gender matter?” *Nature* 442 (7099): 133–136. doi:10.1038/442133a

November 5

- Sismondo 2010, p. 72–80 (“Feminist Epistemologies of Science”)
- Nathaniel C. Comfort. 1995. “Two genes, no enzyme: a second look at Barbara McClintock and the 1951 Cold Spring Harbor Symposium.” *Genetics* 140 (4): 1161–1166. <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1206683/>

Week 11: Science and technology for what and for whom?

November 10

- Langdon Winner. 1980. “Do artifacts have politics?” *Daedalus* 109 (1): 121–136. <http://www.jstor.org/stable/20024652>

November 12

- Collins and Pinch 1998, p. 7–29 (“A Clean Kill?: The Role of the Patriot in the Gulf War”)
- Assignment will be distributed

Unit 3: Engaging contemporary scientific issues**Week 12: Public controversies and credibility****November 17**

- Sismondo 2010, p. 168–179 (“The Public Understanding of Science”)
- Collins and Pinch 1998, p. 57–75 (“Crash! Nuclear Fuel Flasks and Anti-Misting Kerosene on Trial”)

November 19

- Movies: *Gasland* and *Truthland*

Week 13/14: Public participation in science**November 24**

- Sismondo 2010, p. 180–188 (“Expertise and Public Participation”)
- Collins and Pinch 1998, p. 126–150 (“ACTing Up”)

November 26

- Consensus conference

December 1

- Elizabeth A. Corley and Dietram A. Schaeufele. 2010. “Outreach gone wrong? When we talk nano to the public, we are leaving behind key audiences.” *The Scientist* 24 (January 1): 22. <http://www.the-scientist.com/?articles.view/articleNo/27892/title/Outreach-Going-Wrong/>
- Daniel Lee Kleinman, Jason A. Delborne, and Ashley A. Anderson. 2011. “Engaging citizens: the high cost of citizen participation in high technology.” *Public Understanding of Science* 20 (2): 221–240. doi:10.1177/0963662509347137

Week 14/15: Contemporary issues and conclusions

December 3

- Contemporary case 1. Readings TBA

December 8

- Contemporary case 2. Readings TBA

December 10

- Final discussion. No readings.
- Take-home final exam distributed