

RENSELAER POLYTECHNIC INSTITUTE
COURSE SYLLABUS
Science and Technology Studies

STSS 6960 - Concepts in STS

Fall 2009, Friday, 9-11:50 am

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Course Description

STS is a broad and diverse field, and there is no definitive canon or set of theories and concepts that everyone in the field shares. The course is not intended as a comprehensive survey of the field, but rather an introduction to a wide range of ideas and debates that you will certainly encounter as you become more familiar with the research, theories, and community of scholars that make up our field. Each week, we will explore and discuss difficult questions that have inspired and challenged STS scholars for many years. Rather than the typical tour through the field, which organizes readings into theoretical groupings (Strong Program, Actor-Network Theory, Social Construction of Technology, etc.), this course is organized around “lay” concepts – “science,” “nature,” “objectivity,” etc. The readings have been selected to challenge the commonsense ideas that you have likely developed about these everyday concepts.

While I, your instructor, will do my best to guide you through the complex and often contentious theoretical terrain, it is your responsibility as a young scholar to begin to trace out the contours of the scholarly conversations of which the selected readings are only a small part. The major assignment for this course aims to encourage you to discover the broader context in which the reading selections were written. The objective of that assignment, and of this course more generally, is to get you to approach STS as a set of ongoing conversations and debates, in which you will soon be an active participant.

Assignments and Grading

The reading and writing assignments for this class are unconventional. There is no final paper, and there are few assigned readings. However, you will do a lot of reading, writing, talking, and listening. Each student will be asked to lead class discussion at least two times over the course of the semester. In addition to leading discussion on designated days, you are also required to make regular, sustained, thoughtful contributions to class discussions. Your degree of participation will significantly affect your grade.

Major assignment: discovering scholarly conversations

I have chosen two readings on a theme (or, in one case, a single long reading) for each week. You are to read both of the selections and choose one to place in the context of a scholarly conversation that has proceeded over time. To place it in context, you will read “backward and forward,” identifying texts that came before the assigned selection and texts that cite it.

1. Identify a key text that laid some of the groundwork for the assigned selection. Is the selection a response to an earlier text? Does the selection build on the theory

developed previously by another scholar? You should fairly easily be able to “read backwards” by reading the author’s discussion of the literature and looking at the references that the author cites. Choose one key text, find it, read it, and reflect on its relationship to the assigned selection.

2. Identify a text that cites the assigned selection (or cites a related work by the same author) and provides an interesting response to it. You can easily do this by using the Cited Reference Search feature on Web of Science (available through the Folsom Library website). After finding texts that cite the assigned selection, read through the abstracts to choose on that a) appears to have something to say on the theme of the week, and b) seems interesting. Find the article, read it, and reflect on its relationship to the assigned selection.
3. Write a 700-1000 word memo discussing the three texts in relation to one another, focusing on the chosen theme of the week. Please use 12-point font, double-spacing, and 1-inch margins. Proper citations are required. Memos must be printed out (double-sided is fine) and will be collected in class on the day of the discussion of the assigned reading. No late memos will be accepted. Memos will be graded pass/fail/outstanding. I will allow one chance to revise any failing memos, but no “missed” memos can be made up.

Final grades

There are fourteen weeks in the semester; you are required to write seven passing memos. Students completing fewer than seven passing memos will receive a grade of incomplete. Students who complete seven passing memos but rarely or never contribute to class discussion will receive a C. Students who complete seven passing memos and participate regularly in class discussions will receive a B. Students who complete seven passing memos, including at least one outstanding memo, and make strong contributions to class discussions will receive an A.

Readings

All assigned readings will be made available electronically. In addition to the assigned readings, I strongly encourage you to obtain and read at least one of the following “introductions” to the field.

Sergio Sismondo (2003) *An Introduction to Science and Technology Studies* [Highly recommended as a reference to aid you throughout the semester].

David Hess (1997) *Science Studies: An Advanced Introduction* [Somewhat dated now, but still an indispensable guide to the debates and multiple theoretical strands in science studies. As the title suggests, it is an advanced introduction – some prior experience required.]

Daniel Lee Kleinman (2005) *Science and Technology in Society: From Biotechnology to the Internet* [In contrast to the previous two “introductions,” this book introduces STS concepts through discussions of contemporary issues and problems (digital divide, intellectual property, etc.), with an emphasis on the politics of science and technology. Written at an undergraduate level but a good starting point for anyone new to the field.]

Wenda K. Bauchspies, Jennifer Croissant, and Sal Restivo (2005) *Science, Technology, and Society: A Sociological Approach* [Another highly recommended STS primer with a sociological perspective].

Harry M. Collins and Trevor Pinch (1998) *The Golem: What You Should Know about Science* and (2002) *The Golem at Large: What You Should Know about Technology* [Both written for a general audience, these books take a case-study approach to introducing the authors' particular (and highly influential) approach to STS.]

Rudi Volti (2009) *Society and Technological Change*, 6th ed. [This classic introductory text for technology studies is now in its 6th edition. Some say the book is a bit superficial, but it is a great entry point for beginning to think about technology].

Expectations for Reading

Students are expected to come to class having thoroughly read and studied the assigned text(s). What do I mean by "studied"? That means: think about what you read, ask yourself questions, make note of points that need clarification, prepare comments that you might make in class, and commit key terms and definitions to memory. The following is a list of questions that should be helpful to keep in mind as you read and prepare for class discussion:

- What is the argument that the author is trying to make?
- On what data and/or literature are the claims based? What do the author's assumptions seem to be?
- In what ways is the argument persuasive or not to you? Why?
- What do you think the author failed to consider about the issue? Why?
- Where do you agree or disagree with the author, and why? How do your own values and experiences shape your response to the text?
- What strikes you as particularly interesting, curious, insightful, irritating, etc.?
- How does the author's argument relate to other things you have read or to your own experiences?
- Does this reading adequately consider issues of diversity, power, opportunity, discrimination and inequality?
- Why was this text written? How is it important or not?

Academic Integrity

Student-teacher relationships are built on trust. Students must trust that teachers have made appropriate decisions about the structure and content of courses they teach, and teachers must trust that assignments that students turn in are their own. Acts that violate this trust undermine the educational process. Any acts of plagiarism will have grave consequences. The Rensselaer Handbook of Student Rights and Responsibilities defines various forms of academic dishonesty and you should make yourself familiar with these. In this class, all individual assignments that are turned in for a grade must represent the student's own work. Any instances of plagiarism will result in a failing grade for the assignment. Repeated instances of academic dishonesty will be grounds for failing the course. Plagiarism includes purchasing term papers; copying or handing in the writing of another student (current or former); using sentences verbatim from a published source

without appropriate referencing (when in doubt, cite the source); and presenting as one's own the detailed argument of a published source. "Recycling" papers written in other courses is also forbidden.

COURSE SCHEDULE

September 4 - Introduction

What is STS? What do you want STS to be? On the first day of class, we will begin to explore the history, organizations, preoccupations, and publications of the eclectic field known to many as "science and technology studies." Come ready to talk about why you chose to pursue a degree in STS and the questions that motivate you.

Please obtain and read at least one of the introductory books listed above. I recommend you begin a couple of weeks before the semester begins.

In addition, before coming to class, please spend a few hours familiarizing yourself with the following:

STS Wiki http://www.stswiki.org/index.php?title=Main_Page
Society for Social Studies of Science (4S) <http://www.4sonline.org/>
Science, Technology, & Human Values (journal) <http://sth.sagepub.com/>
Social Studies of Science (journal) <http://sss.sagepub.com/>
Science as Culture (journal) <http://www.tandf.co.uk/journals/csac>
List of other STS journals: <http://www.4sonline.org/journals.htm>

September 11 - Science

What is science? What isn't science? How do you tell the difference? Why does it matter? This week, you will read two selections addressing the topic of "demarcation" or "boundary-drawing." Unlike future weeks, I will provide the "background" readings this time. Please read all four of the readings listed below AND seek out a selection for "reading forward" in the conversation. Hint: the article by Evans is the introduction to a collection of articles that may be good choices for this week's memo.

Robert Merton (1942) "The Normative Structure of Science"
Thomas Kuhn (1962) *The Structure of Scientific Revolutions* (selection)
Thomas Gieryn (1999) *Cultural Boundaries of Science: Credibility on the Line* (selection)
Robert Evans (2005) "Demarcation Socialized: Constructing Boundaries and Recognizing Difference," *Science, Technology & Human Values* 30(3)

September 18 - Objectivity

Are scientists objective? Are you? How is objectivity achieved? Why is objectivity so important, anyway? Feminist philosopher Sandra Harding has had an enormous impact on how STS scholars think about scientists' claims to objectivity. Two chapters from her book, *Whose Science? Whose Knowledge?* are selected. Because this is a lengthy reading with a

great deal of review of the literature, if you do a memo on Harding this week you are permitted to skip “reading backward.” A sociological approach to objectivity and the influence of “interests” on scientific knowledge is found in Shapin’s article. If you choose to do a memo on this selection, have a look at the footnotes for some reading options.

Sandra Harding (1991) *Whose Science? Whose Knowledge? Thinking from Women’s Lives* [read chapters 5 and 6].

Steven Shapin (1979) “The Politics of Observation: Cerebral Anatomy and Social Interests in the Edinburgh Phrenology Disputes” pp. 139-178 in Roy Wallis, ed., *On the Margins of Science: The Social Construction of Rejected Knowledge*

September 25 - Facts

How does something become a fact? What does it mean to call something a fact? Once a fact, always a fact? The social construction of scientific knowledge—facts about nature—has long been one of the central concerns of scholars in STS. Each of the readings this week explores the processes by which facts are constructed. Latour is a very prominent, but also controversial, figure in this field. You may find it useful to seek out a critique of his approach. When you read MacKenzie’s analysis, think about how it differs from Latour’s. How does each writer conceive of the “social” production of facts?

Bruno Latour (1987) *Science in Action: How to Follow Scientists and Engineers through Society* [read “Chapter 1: Literature” and refer to the “Introduction” as needed]

Donald MacKenzie (1990, abridged 1998) “Nuclear Missile Testing and the Social Construction of Accuracy,” [this is an edited version of chapter 7 of MacKenzie, *Inventing Accuracy: A Historical Sociology of Nuclear Missile Guidance*]

October 2 - Bodies

Are differences between the sexes “real”? Is “race” biologically significant? What are the social consequences of scientific research on the differences among unequal social groups? Last week, you began to explore the social construction of scientific “facts.” This week, we continue in that vein, focusing on the processes by which “facts” about human difference are constructed and challenged.

Londa Schiebinger (1986) “Skeletons in the Closet: The First Illustrations of the Female Skeleton in Eighteenth-Century Anatomy,” *Representations*, No. 14, pp. 42-82

Jenny Reardon (2004) *Race to the Finish: Identity and Governance in an Age of Genomics* [read the introductory chapter]

October 9 - Technology

How does technology shape society? How does society shape technology? The readings selected for this week each have had an enormous influence on technology studies. Although we will barely scratch the surface of technology studies this week (or in this

course), the assigned selections, and your work to put them in the context of a conversation, will provide a glimpse of some of the key debates.

Langdon Winner (1986) "Do Artifacts Have Politics?"

Trevor J. Pinch and Wiebe E. Bijker (1987) "The Social Construction of Facts and Artifacts: Or How the Sociology of Science and the Sociology of Technology Might Benefit Each Other"

October 16 – Modernity

What is modernity? When is (was?) the modern period? How did science contribute to the making of modern society? What is distinctive about the modern era? Both of the readings this week take on the idea of modernity. The selection by Latour takes on the question of what it means to be modern by addressing the relationship between nature and culture. Ulrich Beck's concept of reflexive modernization, discussed in the other reading, comes out of sociological debates about the particular condition of contemporary society. While, unlike Latour, Beck is not typically identified as an STS scholar, science features prominently in the idea of reflexive modernization. How does Beck's conceptualization of science compare to Latour's?

Ulrich Beck, Wolfgang Bonss, and Christoph Lau (2003) "The Theory of Reflexive Modernization: Problematic, Hypotheses and Research Programme," *Theory, Culture & Society* 20(2): 1-33. [note: Beck has published widely on this topic, so for your memo you need not restrict yourself to work that cites this particular article].

Bruno Latour (1993) *We Have Never Been Modern* [focus on pp. 13-35 and skim the rest of the excerpt provided]

October 23 - Nature

Is nature distinct from society and culture? Is "nature" socially constructed? What is the role of nature in the construction of scientific knowledge? Both of the selections this week are fairly challenging, and will make the most sense if you familiarize yourself with the debates in which the authors are participating. For example, to make sense of the article by Callon, you may first need to read about the "strong program" in the sociology of scientific knowledge (SSK), of which he is a strong critic (the article assigned earlier by Steven Shapin about phrenology is an example of SSK work). Haraway's writing style is notoriously obscure, but the article is well worth the effort it takes to read it. Recognize that she is referencing Latour's argument (from last week) and it will make more sense.

Donna Haraway (1992) "The Promises of Monsters: A Regenerative Politics for Inappropriate/d Others"

Michel Callon (1986) "Some elements of a sociology of translation: domestication of the scallops and the fishermen of St Brieuc Bay," first published in J. Law, *Power, Action and Belief: A New Sociology of Knowledge?* London, Routledge, pp.196-223.

October 30 - Disciplines

Why is scientific/intellectual life organized into disciplines? What are the implications of “disciplining” knowledge? What—or who—is being disciplined? How are “interdisciplines” (like STS?) different from disciplines? There is a long history of research on the social organization of science and the emergence of fields, subfields, disciplines, interdisciplines, etc. The two readings this week represent just a small sample of ways to approach these questions.

Stephen Turner (2000) “What are Disciplines? And How are Interdisciplines Different,” in Stehr and Weingart, *Practicing Disciplinarity*.

Adele Clarke (1998) *Disciplining Reproduction: Modernity, American Life Sciences, and the Problems of Sex* [read chapter one]

November 6 - Rewards

Why do some scientists emerge as “stars” in their fields? Is science a meritocracy? These selections consider how scientists are rewarded for their work. Rossiter examines gender inequality in how scientists are rewarded for their work, while Latour and Woolgar offer a classic statement on “cycles of credit” in scientific work.

Margaret W. Rossiter (1993) “The ~~Matthew~~ Matilda Effect in Science.” *Social Studies of Science* 23: 325-41.

Bruno Latour and Steve Woolgar (1979) *Laboratory Life: The Construction of Scientific Facts* [read chapter 5, “Cycles of Credit”]

November 13 - Commercialization

Do commercial interests damage the scientific process? Recently, many critics have raised an alarm about the increasing commercialization of university research. Is this really a new phenomenon? What is the difference between public-interest and private-interest research? How do university-industry ties affect the ways that scientists work and the knowledge that they produce?

Henry Etzkowitz (1998) “The norms of entrepreneurial science: cognitive effects of the new university–industry linkages,” *Research Policy* 27: 823-833.

Daniel Lee Kleinman and Steven P. Vallas (2001) “Science, Capitalism, and the Rise of the ‘Knowledge Worker’: The Changing Structure of Knowledge Production in the United States,” *Theory and Society* 30: 451-492.

November 20 - Public understanding

What does the public understand about science? Are laypeople ignorant of scientific knowledge? Both of the selections this week challenge the conventional “public understanding of science” approach, which assumes that laypeople are passive recipients of scientific knowledge who often misunderstand the information they are given. Both of the authors whose work we are reading this week have been highly influential in shaping discussions about public participation in science and the value of “lay knowledge.” For your memos, feel free to use work that cites any of the relevant writings by these prolific authors.

Brian Wynne (1992) "Misunderstood Misunderstanding: Social Identities and Public Uptake of Science," *Public Understanding of Science* 1: 281-304.

Phil Brown (1992) "Popular Epidemiology and Toxic Waste Contamination: Lay and Professional Ways of Knowing," *Journal of Health and Social Behavior* 33(3): 267-281.

November 27 – Thanksgiving Break

December 4 - Expertise

Who is an expert? What do we need experts for? What is the role of experts in democracy? Can non-experts (laypeople) contribute usefully to scientific and technological debates? This week builds on last week's discussion, and only one (long) article is assigned. Written by two senior scholars in STS, the essay attempts to outline a new research program in our field. It has been controversial, however, particularly among those who had been studying expertise long before the article was published. A number of essays were published in response – they are good candidates for your memos.

H.M. Collins and Robert Evans (2002) "The Third Wave of Science Studies," *Social Studies of Science* 32(3): 235-296.

December 11 - Controversies

How are scientific controversies resolved? What are the benefits and drawbacks of bringing science to bear on contentious political debates, such as in environmental and health policy? What is the appropriate role of STS scholars in such controversies? On this final day of class, we will consider how we as STS scholars may use the knowledge gained this semester to address pressing social and ecological problems. Come ready to talk about the contributions you hope to make, not only in the field of STS, but also in the broader social world we all inhabit.

Pam Scott, Evelleen Richards, and Brian Martin (1990) "Captives of Controversy: The Myth of the Neutral Social Researcher in Contemporary Scientific Controversies," *Science, Technology, & Human Values*, Vol. 15, No. 4, pp. 474-494.

Daniel Sarewitz (2004) "How Science Makes Environmental Controversies Worse," *Environmental Science & Policy* 7: 385-403.