

SCSO 1400
Theories and Controversies in Science and Society
Fall 2009

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Office Hours: Tuesdays 2:30-3:30
Course Times: Tuesday, Thursday 9-10:20

COURSE DESCRIPTION:

This course is designed to introduce students to the interdisciplinary field known as “Science Studies.” Science Studies takes the nature of science as its object. That is, it analyzes the relationships between science and society, science’s effects on society, and how, when, and why different societies decide what counts as “science.” Science Studies recognizes that science in the twenty-first century is not merely a set of conclusions about the nature of the world around us, but a complex bundle of practices, norms, and values that both reflect and shape our deepest convictions about what it is to be a person who knows.

Interwoven with our views of science are assumptions about the character of ideas that can be thought and not thought, diseases that can be treated and not treated, lives that can be lived and not lived. These aspects of science are so deeply embedded in twenty-first century American culture that they may be all but invisible to us; their centrality to our whole view of ourselves and our world means that fundamental scientific constructs like “experience,” “objectivity,” or “certainty” can be very resistant to analysis. Nonetheless, many people—including philosophers, historians, anthropologists, sociologists and scientists—have made the effort and in so doing have suggested ways for us to approach questions like:

- **What is science? A thing? A method? An ideology? Truth?**
- **How is scientific knowledge built, tested, validated, legitimized,**

promulgated and used? To what ends?

- **What is the authority of science? Who can claim that authority? How? In what contexts? Who cannot?**
- **What power can and should science wield? When? How? Why?**
- **In what ways is science political? Is it ever non-political?**
- **What is objectivity? What are its benefits and limitations? Can scientists be objective?**
- **What roles do gender, race, class and power play in scientific knowledge?**

In the past four decades, these kinds of questions have piqued the interest of people from virtually every corner of the academic world. Science Studies has quickly become a huge and ever changing area without clear boundaries or a single, clear disciplinary structure. As is to be expected from a body of material written by scientists, philosophers, historians, anthropologists, literary theorists and many others, conclusions vary widely, and arguments can be fierce. This may also be the case in SC 1400, because the course will ask you to interrogate some of your most fundamental assumptions about knowledge and about science. As it does so, you should expect controversy and there will be few clear answers.

PREREQUISITES:

There are no prerequisites for this course. My expectation is that students will come into this course with very different knowledge bases and skills. Some of you will be well grounded in social thought and social theory. Some of you may be well informed of current debates and questions about science and society. It will be our collective task to share these interests and skills with each other in order to develop a dialogue that questions, challenges and complements the readings and each other both inside and outside the classroom.

COURSE GOALS:

- One of the main objectives in this course is for you to decide which questions and approaches are most useful for analyzing contemporary issues and debates in science and society.
- We will study the ways in which scholars from different disciplinary backgrounds – history, sociology, philosophy, anthropology – have approached questions about science, power, and knowledge-making. This means that we will learn about the different ways in which people weigh the value of different types of data.
- We will learn how to apply approaches that we have learned from the assigned readings to analyses of current events about scientific developments, as presented to us in different types of media.
- We will learn to process data in various forms (reading assignments, visual media, current events, class discussion, group presentations).
- We will learn to articulate our positions verbally, by using evidence, in class discussions, and in response to group presentations.
- We will develop our skills in writing clear prose, in which we will present an original argument and use convincing evidence (from the readings) to support our case.

COURSE REQUIREMENTS:

Course Grading

• Prepared and engaged class participation	– 10%
• Group Presentations	– 10%
• 8 Short Response Papers	– 40%
• Final Project	– 40%

CLASS PARTICIPATION:

Class participation (10% of your final grade) will be assessed not simply on the volume of your participation in seminar discussions but on the quality and thoughtfulness of your contribution. This is invariably a subjective measure, but it is important for students to consider whether they have a particular question that they want to address and how that relates to the readings. What I particularly want to see is that students demonstrate close reading skills by drawing on the texts themselves and offering analysis of an author's argument.

Attendance:

Regular, prepared class attendance is required—The grade of anyone who misses three or more classes without prior notice or excuse will be dropped by five percentage points.

Required Texts: (for purchase at Brown Bookstore, and for reserve at the Rockefeller Library or Sciences Library)

- Kuhn, Thomas (1966), *The Structure of Scientific Revolutions*, 2nd edition, University of Chicago Press
- Londa Schiebinger, (2008) *Nature's Body: Gender in the Making of Modern Science*, Rutgers University Press

Class Schedule and Assignments:

Week One: Introduction: What is Science Studies?

Thursday 9/10:

Introduction to the social study of science

Please turn in handout

Week Two: Robert Merton and the Normative Structures of Science

Tuesday 9/15:

Please turn in syllabus questionnaire

Merton, Robert (1938) “Science and the Social Order” from *The Sociology of Science*, Normal W. Storer, ed. University of Chicago Press, pp.254-266

Merton (1943), “The Normative Structure of Science”, *The Sociology of Science*, Normal W. Storer, ed. University of Chicago Press, pp. 267-27

Film: *The Future of Food* (webstreaming on mycourses)

Thursday 9/17:

Short Response Paper 1: Who in the film is/is not appealing to Mertonian norms of science in the film? How are different players in the film defining the term “science?”

Week Three: The Two Cultures

Tuesday 9/22:

C.P. Snow (1959), “The Two Cultures” and “The Scientific Revolution” Rede Lecture in *The Two Cultures*, Harvard University Press, 1993, pp.1-51

Thursday 9/24

Short Response Paper 2: Are there “two cultures” among Brown undergraduate students? Among the faculty? Base your response on an informal participant/observation of your peers, your professors, and your dorm-mates.

Discussion Questions: How can we think of debates in *The Future of Food* in light of Snow's analyses of structural inequality? How does the "genetic" revolution change Snow's arguments about technology, progress, and feeding the world?

Week Four: Karl Popper – The Scientist as Critical Thinker

Tuesday 9/29

Popper, Karl 1965 "Science: Conjectures and Refutations" from *Conjectures and Refutations: The Growth of Scientific Knowledge* (New York: Basic Books) pp. 33-59

Thursday 10/1

Short Response Paper 3 and Discussion: Choose a news article in the science section. Is scientific experimentation presented as falsifiable, in Popper's sense of the term?

Week Five: Thomas Kuhn: The Scientist as Normal

Tuesday 10/6

Kuhn, Thomas (1966), *The Structure of Scientific Revolutions*, 2nd edition, University of Chicago Press

Thursday 10/8

Short Response Paper 4: Compare and contrast Kuhn and Popper's views: how is scientific knowledge produced? What makes it count as "science"?

Group Presentation: Create a visual representation of a Kuhnian 'scientific revolution'

Week Six: ‘Science’ and ‘Society’: Constructivist Approaches

Tuesday 10/13

Hacking, Ian 1999 Preface, “Why ask What?” and “What about the Natural Sciences?” In *The Social Construction of What?* Pp. 1-35, 63-99

Discussion Questions: What does Hacking mean by "social construction," and what are his goals in analyzing social constructionism?

Thursday 10/15

Martin, Emily 1991 “The egg and the sperm” in *Signs* Volume 16: 3 pp. 485-501

Kolbert, Elizabeth 2009 "XXXL: Why are we so fat?" in *The New Yorker* 7/27/09

Discussion Questions: How would Hacking describe Martin’s analysis of reproductive biology? What is at stake in the different etiologies of the American obesity epidemic that Kolbert discusses?

Week Seven: Society/Nature

Tuesday 10/20

Short Response Paper 5 and Class Discussion: Find two different news items or excerpts from scholarly articles that argue for the “social construction” of something for different reasons. How would Hacking explain each? Don’t forget to attach the text(s) you use to your paper.

Thursday 10/22

Haraway, Donna (1988) “Situated Knowledges: The Science Question

in Feminism and the Privilege of Partial Perspective” in *The Science Studies Reader*, pp. 172-188

Discussion Question: What is “situated knowledge”? What arguments does Haraway make about social ideas of gender and scientific knowledge?

Week Eight: What Makes Science Special?

Tuesday 10/27

Latour, Bruno, “Give me a Laboratory and I will Raise the World,” in *The Science Studies Reader*, pp. 258-275

Thursday 10/29

Bloor, David (1976) Knowledge and the Social Imagery, University of Chicago Press, 1991, pp. 3-23

Short Response Paper 6: Using only the text of Latour’s “Give me a Laboratory...” tell the story of Pasteur’s development of the anthrax vaccine the “conventional way.” Then elaborate on at least three ways in which Latour challenges the conventional story. On which principle(s) of Bloor’s Strong Programme does he rely to challenge the conventional narrative? Explain how.

Discussion Question: How does Latour explain the power of science? How does Bloor?

Week Nine: Gender and Race in the Making of Modern Science

Tuesday 11/3

Schiebinger, Londa *Nature’s Body* (Introduction, Ch. 1-3)

Discussion Question: What is Schiebinger’s explanation of the attractiveness of certain scientific explanations over others? How does this differ from Merton’s, Popper’s, or Kuhn’s?

Thursday 11/5

Schiebinger, Londa *Nature's Body* (2nd half)

Discussion Question: What is the relationship that Schiebinger draws between who produces scientific knowledge and scientific outcomes? How might we complicate her explanation? What is the relationship between a social group (based on race, class, or gender) and a Kuhnian paradigm?

Week Ten: Categories that Persist: Contests of Medical Inclusion

Tuesday 11/10

Epstein, Steven, 2007 Introduction, "How to Study a Biopolitical Paradigm," and "Whither the Paradigm" from *Inclusion*, pp. 1-30, 258-end

Crowley, Lavera, "The Paradox of Race in the Bidil Debate." From *Journal of the National Medical Association*, July 2007 821-822

Duster, Troy, "Deep Roots and Tangled Branches" (On Wiki)

Sankar, Pamela and Kahn, Jonathan, "Bidil: Race Medicine or Race Marketing?" From *Health Affairs* October 11, 2005

American Anthropological Association Statement on Race (On Wiki)

Thursday 11/12

Short Response Paper 7: How have different actors explained the relationship between race and biology?

Film Excerpt: *Unnatural Causes*

Group Presentation: What are the advantages and drawbacks of tailoring medical science to racial and ethnic specificity? Does Bidil represent an advance in personalized medicine or a misunderstanding of human variability? What from Schiebinger has persisted?

Week Eleven: Science and Technology in the Social World

Tuesday 11/17

Hughes, Thomas P., 2004 Introduction: Complex Technology from *Human-Built World* pp. 1-17

Winner, Langdon, 1986 "Do Artifacts Have Politics?" from *The Whale and the Reactor: a Search for Limits in an Age of High Technology* pp. 19-39

Cowan, Ruth S. "Less Work for Mother?" *American Heritage* Spring 1987 Vol 2: 3 (On Wiki)

Lepore, Jill "Baby Food: If Breast is Best, Why Are Women Bottling Their Milk?" from *The New Yorker* 1/19/09 (On Wiki)

Thursday 11/19

Hess, David, 1995 "Other Ways of Knowing and Doing: The Ethnoknowledges and Non-Western Medicines" in *Science and Technology in a Multicultural World* pp. 185-249

Hess, David "Cosmopolitan Technologies, Native Peoples, and Resistance Struggles" *Science and Technology in a Multicultural World* pp. 211-249

Ayers, Ed "An order of French Fries" or "The story of a newspaper" or "The history of a cup of coffee" from *Worldwatch*

Hoodia handout (see wiki)

Film: *Dreamers of Arnhemland*

Group Presentation: What are the factors that led to the "success" of aboriginal science as presented by the film? How does this narrative contrast with the Hoodia case? How might Hess categorize the difference?

Week Twelve: Technologies and Ideologies of War in Science

Tuesday 11/24

Leslie, Stuart 1993 Introduction from *The Cold War and American Science* pp. 1-13

Mukerji, Chandra 1989 Chapters 1-3 from *A Fragile Power* pp. 1-61

Martin, Emily, "Toward an Anthropology of Immunology: The body as nation state" in *The Science Studies Reader*, p.358-371

Gusterson, Hugh 2009 "Militarizing Knowledge" from *The Counter-Counterinsurgency Manual: Or, Notes on Demilitarizing American Society* pp. 39-55

Short Response Paper 8: Look into an example of an everyday product that was originally developed in the context of war-making. What is the relationship, if any, between the circumstances of the product's development and its current use?

Discussion Question: On what various levels do war and militarism function as a force in the construction of scientific knowledge? Can spinoffs of military technology ever be completely re-signified?

Thursday 11/26

THANKSGIVING HOLIDAY!!! ENJOY! (And study!)

Week Thirteen: Science and Religion

Tuesday 12/1

From Numbers, Ronald 2009 *Galileo Goes to Jail and And Other Myths About Science and Religion*, Harvard University Press:

Ronald Numbers, "Introduction," pp. 1-7

Michael Shank, “Myth 2. That the Medieval Christian Church Suppressed the Growth of Science,” pp.19-27

Margaret Osler, “Myth 10. That the Scientific Revolution Liberated Science from Religion,” pp. 90-98

John Hedley Brooke, “Myth 25. That Modern Science Has Secularized Western Culture,” pp. 224-232

Thursday 12/3

Bring in a news item on the intersection between “science” and “religion.” What are some of the narrative tropes being used to explain the relationship?

Discussion Question: What are some dominant cultural understandings of the interaction between science and religion, and how might we complicate them? How can we reinterpret America's "culture wars" in light of a historically-informed understanding of science and religion?

Week Fourteen: Final Review

Tuesday 12/8

Fausto-Sterling, Anne (2003) “Science Matters, Culture Matters” in Perspectives in Biology and Medicine 46(1):109-24

FINAL PROJECT: Given the approach Fausto-Sterling lays out for her embryology class, give a “Fausto-Sterling-style” presentation of a science-society topic of your choice.

Thursday 12/10

FINAL PROJECTS PRESENTATION

