

BIS 307, Winter 2009 Science, Technology & Society

Meeting Tuesdays and Thursdays, 8:45 – 10:50 AM in UW1-010

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Office Hours: Mon & Wed 10-11 AM, Tues & Thurs 11 AM-Noon, and by appointment

Description

This course introduces students to the critical interdisciplinary study of the relationship between science, technology, and society. As such, it is the required core course for students intending to major in the Science, Technology, and Society (STS) option in the IAS Program. The central premise is that the production of scientific and technological knowledge is shaped by social, cultural, and political institutions, and that these institutions themselves focus and shape the pursuit of scientific and technological knowledge; understanding the nature of this two-way relationship is not only intrinsically worthwhile in an academic sense but also obligatory in the life of a just, well-ordered, sustainable society. Our tasks are to open the black boxes of science and technology, probe their meanings and the ways in which their meanings are constructed, critically assess the professional practice of science and engineering, analyze the concept of technological progress and explore the ways in which societies fund, promote, and regulate scientific activities to achieve broad social and national goals.

Several themes recur throughout the course. One is the nature of fact, truth, and evidence in relation to scientific knowledge and practice. A second is the nature and extent of human agency over technological change: what determines which scientific paths and technologies are pursued at any given time and place? A third is the potential for democratic governance of science and technology. A fourth concerns the role of ethics and ways in which science and technology are reflective of and responsive to the moral values of society. And a fifth theme is the diversity in the institutions and public policies that countries around the world bring to bear in the management of scientific research and promotion of technological innovation: we seek to understand the origins of these differences and the practical consequences for the development of science and technology across time and space.

The course will be taught this quarter in the manner of a seminar. Enthusiastic, informed participation by students will be essential to its success. The course is divided into three parts corresponding broadly to the three required textbooks. In the first part each set of readings is devoted to a group of related questions in the STS literature: class time will be devoted to interpreting and critiquing the readings in relation to the questions. The second part is organized around contemporary controversies involving science and technology: the readings present two opposing points of view, which students then reflect on and assess through written exercises and discussion in class. In the third part, we drill down into the politics and institutions that shape genetics and biotechnology research in the US, Britain, and Germany. Here, we apply tools of

comparative politics to analyze the institutions and policies governing biotechnology in three of the most important players, focusing on their approaches to managing risk and regulating introduction of new products.

The requirements for the course include short written response essays, submitted weekly, that speak to issues raised in the readings; participation in formal debates on the controversies that are the subjects of the second part of the course; one longer essay on a topic chosen by the student, an in-class final exam, and informed class participation.

Assignments in Detail

1. **Three Response Essays, 500 words each (30 % of total course grade):** These short essays address the questions raised in Part I of the course. They will be **due in class January 15, 22, and 29**. You choose the topic from a list of questions I'll post on Blackboard the Friday before the essay is due. The first posting will be Friday, January 9, for the essay due January 15. (These postings will also include study questions and notes to help you prepare for discussions the following week.)

2. **Debate on an issue from the Taking Sides book during Part II of the course (15 % of total course grade):** For each issue assigned (until all students have had the chance to participate), there will be a debate between two teams of students, each of which argues one side of the issue. The number of such debates, and number of students on each team, will necessarily depend on the number of students in the class; the teams will be organized the second week of the quarter. Each team will be responsible for presenting the position in the article of the side it represents; teams may add additional evidence and arguments that supports their side. I expect that each debate will play out over about 30-40 minutes. The debate will proceed in three rounds: First, each team presents its case, during which time each student will have roughly 3-5 minutes to speak (longer if the teams are small). In the second round, the teams will rebut the arguments made by the opposing team. In the last round, the audience will have a few minutes to ask questions and make comments. Each student will write out his or her statement and submit it to me after the debate; you should not read from this statement during the debate, but you may use note cards. Members of the audience will evaluate the debate in a paragraph or two after the debate has concluded; these will count under class participation. Students will be graded individually on the quality of their written statement and effectiveness of their presentation in the class. More details will be forthcoming once we've organized into teams.

3. **Free Essay, 1000-1250 words (20 % of total course grade):** This is to be an argumentative essay on a topic of your choice that uses one or more of the course readings as a point of departure. You will be expected to consult a small number of outside sources, preferably journals devoted to the STS field. I'll provide you with some sample topics, list of STS journals, and formatting guidelines later in the course. This essay will be **due in class March 3**.

4. **Take-Home Final Exam (20 % of total course grade):** This will be due in my office **no later than noon March 17**. It will have three parts: 1) a 500 word essay on how the course changed the way you think about science and technology. 2) a 750-word critical review of the book *Designs on Nature*. The essay will begin with one-paragraph summary of the book, followed by a paragraph on an argument or part of the book you found especially compelling, and a paragraph on an argument or part of the book you found to be flat or unpersuasive. 3) A surprise question, to be given at last class meeting.

5. **Informed class participation (15 % of total course grade):** Most of our class time will be spent discussing the reading, either as a full class or in small groups. To prepare for our class meetings, I'll post study questions on Blackboard most Fridays. If a news article appears that's relevant to the course, I may post it and ask that you be prepared to discuss it in class as well. During class you should expect to be presented with at least some of the questions (and maybe new ones) to chew on. At times I may ask you to think on your feet by writing a quick paragraph in response to a question; at other times I'll ask you to ponder questions in small groups, writing out one set of answers per group. All this work will be assessed on a credit/no-credit basis. Always bring the assigned reading for the day to class with you.

Course Texts and Resources

Wenda K. Bauchspies, Jennifer Croissant, and Sal Restivo, *Science, Technology, and Society: A Sociological Approach* (Blackwell, 2006)

Sheila Jasanoff, *Designs on Nature: Science and Democracy in Europe and the United States* (Princeton University Press, 2005)

Thomas A. Easton, *Taking Sides: Clashing Views in Science, Technology, and Society, Eighth Edition* (McGraw-Hill, 2009)

Additional readings will be made available through the library's electronic reserve (e-reserve) service at the following URL:

<https://eres.bothell.washington.edu/eres/coursepage.aspx?cid=683>

These readings will be noted in the reading schedule below. Other readings will be posted on the Blackboard site as noted in the reading schedule.

The above readings may be supplemented on occasion with video documentary and news articles.

We will use Blackboard throughout the course for announcements, posting of study questions and other matters. It is your responsibility to self-enroll in the course through Blackboard and to check it regularly for announcements and other postings. See the following link for details on enrolling in and using Blackboard: http://www.uwb.edu/edtech/blackboard/student_index.xhtml

Policies and Rules

GRADING: Final grades are recorded on a 4-point scale, in accordance with UW policy. Tests and problem sets are usually graded on a 100-point scale and converted to the 4-point scale using the following conversion: 95-100=4.0, 90=3.5, 85=3.0, 80=2.5, 75=2.0, 70=1.5, 65=1.0, 60=0.0. A grade of 88 would, for example, correspond to a 3.3. For more information on the UW grading system, see http://www.washington.edu/students/gencat/front/Grading_Sys.html.

LATE ASSIGNMENTS: Late work will be docked half a grade point for each day after the due date unless a student has a compelling reason and has consulted with me in advance.

DISABILITY ACCOMMODATIONS: Students who believe they have a disability and would like academic accommodations should contact Disability Support Services at 425.352.5307, 425.352.5303 TDD, 425.352.5455 FAX, or at dss@uwb.edu. They will be happy to provide assistance. Students requesting this support will be asked to provide documentation of the disability.

NOTEBOOK COMPUTERS AND OTHER ELECTRONIC DEVICES: I tend to find these annoying unless they're being used on a specific assignment. If you have a compelling need to use a notebook computer in class for taking notes, let me know in advance—I'm willing to accommodate you if I can trust that you're using it appropriately. When I'm talking, you should be listening; and when we're working problems in class, you should be doing the same. If you feel the need to chat electronically or surf the web during class, respect your classmates and me by removing yourself from the classroom; otherwise, you may be asked to leave or at least stow the computer.

ACADEMIC INTEGRITY: UW students are held to a high standard of academic honesty and integrity. According to UW policy, "academic misconduct includes but is not limited to cheating, facilitation, plagiarism, and fabrication in connection with any exam, research, course assignment, or other academic exercise that contributes, in whole or in part, to the satisfaction of requirements for courses or graduation." See the following link for definitions and examples of cheating, facilitation, plagiarism, and fabrication, including the process by which such incidences are reported and resolved: http://www.uwb.edu/academic/policies/Academic_Conduct.xhtml

The library has prepared the following reference on plagiarism and strategies for avoiding it: <http://www.uwb.edu/library/guides/research/plagiarism.html>

SUPPORT FOR LEARNING: The Writing Center provides free consultations to help students develop ideas and communicate them clearly in writing. It is located in UW2-124. Check the website for hours and other details: <http://www.uwb.edu/writingcenter/>
I will refer you to the Writing Center if I think you need and would benefit from its help.

REVISIONS TO THE SYLLABUS: The syllabus may be amended if circumstances warrant to correct errors or adjust the schedule of readings or of assignments. Should a revision be needed, the new version will be posted to Blackboard along with an announcement.

Schedule

Readings should be done *before* the class meeting for which they are assigned. Bring all readings to class on the date they are assigned. * denotes reading on e-reserve.

Texts are abbreviated as follows: STS = *Science, Technology, and Society*; TS = *Taking Sides*; DON = *Designs on Nature*

1. Jan 6 **Course Introduction**

Part I BIG QUESTIONS IN STS

2. Jan 8 **Questions 1: What is science? Society? Technology?
What is the “standard model” of the scientific method?
What is “progress?” Does technological change mean progress?**

- STS, Chapter 1
- TS, Introduction
- Leo Marx, “Does Improved Technology Mean Progress?” *Technology Review* (January 1987), pp. 33-41. (Download from the “Notes and Readings” section of Blackboard.)

3. Jan 13 **Questions 2: What counts as scientific fact? Are science and technology socially and culturally constructed? Or do they exist independently of social context?**

- STS, Chapter 2 (skip section entitled “Feminism and Science Studies”)
- *T.J. Pinch and W. Bijker, “The Social Construction of Facts and Artifacts,” in W. Bijker et al, eds., *The Social Construction of Technological Systems*, pp. 17-50.

4. Jan 15 **Questions 3: What is truth? Does science lead to truth? How does science compare with magic and religion? How is science organized as an institution? How do scientists, and those who interpret science, use data and evidence?**

- STS, Chapter 3
- *R.A. Muller, “Evidence,” in *Physics for Future Presidents: The Science Behind the Headlines*, pp. 278-299.

View in class: Excerpts from the documentary film *An Inconvenient Truth*

Response Essay 1 Due

5. Jan 20 **Questions 4: Are science and technology political? Does technology govern society? Or does society govern technology? What is technology doing to us?**

- STS, Chapter 4 (pp. 73-93 only)
- *L. Winner, "Do Artifacts have Politics?" In *The Whale and the Reactor: A Search for Limits in an Age of High Technology*, p. 19-39.
- *N. Carr, "Is Google Making Us Stupid?" *The Atlantic* (July-August 2008), 56-63, at <http://www.theatlantic.com/doc/200807/google>
- P. Sherrard, "Modern Science and the Dehumanization of Man," *The London Times*, 6 June 1995. (Download from the "Notes and Readings" section of Blackboard.)

6. Jan 22 **Questions 5: Do men and women experience science and technology differently? Do science and technology reinforce or shatter traditional gender relations? Do the norms of science work against women?**

- STS, chapter 2, section entitled "Feminism and Science Studies," pp. 26-32.
- *P.J. Bowler and I.R. Morus, "Science and Gender," in *Making Modern Science: A Historical Survey*, pp. 487-509.
- *R.S. Cowan, "The Industrial Revolution in the Home," in D. MacKenzie and J. Wajcman, eds, *The Social Shaping of Technology*, pp. 281-300.
- *S.V. Rosser, "Using the Lenses of Feminist Theories to Focus on Women and Technology," in M.F. Fox, D.G. Johnson, and S.V. Rosser, eds, *Women, Gender and Technology*, pp. 13-46.

Response Essay 2 Due

7. Jan 27 **Questions 6: How do different countries manage and regulate science and technology? Are there different national approaches to science and technology? How should we approach the problem of comparing institutions and policies in different countries?**

- DON, Prologue and Chapter 1

8. Jan 29 **No Assigned Topic or Reading**
Catch up, view video, or have free discussion

Response Essay 3 Due

Part II CURRENT CONTROVERSIES

9. Feb 3 **The Place of STS in Society**
Does Politics Come before Science in Current Government and Decision Making?
- TS, Issue 1, pp. 2-27
 - D. Guston, “Forget Politicizing Science. Let’s Democratize Science!” *Issues in Science and Technology* (Fall 2004), at http://www.issues.org/21.1/p_guston.html
10. Feb 5 **Environment**
Is it Time to Revive Nuclear Power?
Will Hydrogen Replace Fossil Fuels for Cars?
- TS, Issue 5, pp. 95-115
 - TS, Issue 6, pp. 116-136
11. Feb 10 **Human Health and Welfare**
Should Potential Risks Slow the Development of Nanotechnology?
Are Genetically Modified Foods Safe to Eat?
- TS, Issue 10, pp. 196-216
 - TS, Issue 11, pp. 217-235
12. Feb 12 **Human Space Travel and Surveillance Technology**
Is “Manned Space Travel” a Delusion?
Does the Spread of Surveillance Technology Threaten Privacy?
- TS, Issue 14, pp. 268-281
 - TS, Issue 16, pp. 304-319
13. Feb 17 **The Internet, Social Relationships, and Democracy**
Does the Internet Strengthen Social Connections?
- TS, Issue 15, pp. 284-303
 - *C.R. Sunstein, “Democracy and the Internet,” in J. Hoven and J. Weckert, eds, *Information Technology and Moral Philosophy*, pp. 93-110.

14. Feb 19 **Ethics** **Is it Ethically Permissible to Clone Human Cells?**

- TS, Issue 19, pp. 359-381
- TBA Article on the status of stem cell research at the start of the Obama Administration

15. Feb 24 **Science and Engineering Education** **Is there a shortage of scientists and engineers in the US? Has public understanding of science and technology fallen to worrying levels?**

- *J. Trefil, "Scientific Literacy: What is it?" in J. Trefil, *Why Science*, pp. 20-33.
- *J. Trefil, "The Great Ideas Approach to Scientific Literacy," in *Why Science*, pp. 176-194
- National Academy of Sciences, *Rising Above the Gathering Storm: Energizing and Employing America for a Brighter Economic Future* (National Academies Press, 2007). Read Executive Summary and skim rest of report. (Download from the "Notes and Readings" section of Blackboard.)
- *D.S. Greenberg, *Science, Money, and Politics: Political Triumph and Ethical Erosion*, chapter 13 ("Public Understanding of Science), pp. 205-233.

Part III In-Depth Perspective on Democracy and Regulation of Biotechnology in Britain, Germany, and the US

16, 17, 18, 19 Feb 26-Mar 10

These last few class periods will be dedicated to analysis and discussion of the DON text by Sheila Jasanoff. Details on specific readings and activities TBA.

Free Essay Due March 320. Mar 12 **Are we Doomed? Final Words**

- STS, Chapter 5
- J. Franzen, "I Just Called to Say I Love You," *Technology Review* (Sept/Oct 2008) (Download from the "Notes and Readings" section of Blackboard.)

Mar 17 Take-home Exam Due in my office by 12 noon.