

Science, Technology, and Society (STS)

LAIS 565 – Fall 2011 – CRN #82467

Time/Place: Tuesdays, 3:15-6:15pm, Meyer Hall 357

Professor: Jason Delborne (delborne@mines.edu)
407 Stratton Hall, 303-273-3753

Office Hours: Tuesdays 11:00am – 3:00pm, or by appointment

I. Course Description

STS analysis points to all the “higher” aspects of human endeavor—truth and power and justice and equity and democracy—and asks how these can be conserved and consolidated in modern society, so that the immense possibilities of scientific knowledge and technological innovation can be harnessed (in Bacon’s words) “for the relief of man’s estate” (David Edge, 1995).

This course, designed specifically for graduate students in the SmartGeo IGERT program but open to all Mines graduate students (and senior undergraduates, with permission), provides an introduction to foundational concepts, themes, and questions developed within the interdisciplinary field of STS (science and technology studies OR science, technology, and society). Readings address anthropological understandings of laboratory practice, sociological perspectives on the settling of techno-scientific controversies, historical insights on the development of sociotechnical systems, philosophical stances on the relationship between technology and humans, and political aspects of negotiations between scientific experts and the public.

II. Course Objectives

1. Become familiar with key conceptual and theoretical developments in the field of STS from the mid-20th century to the early 2000s.
2. Develop and improve your analytical skills to compare, contrast, and apply theoretical approaches in STS.
3. Investigate an area of the STS literature that appeals to your intellectual curiosity and/or relates to your graduate research in your degree program.
4. Self-reflect on your own assumptions about the relationships among knowledge, science, technology, politics, and publics.

III. Required texts and access to readings

Johnson, Deborah G. and Jameson M. Wetmore, Eds. (2009) *Technology and Society: Building Our Sociotechnical Future* (Cambridge, MA: MIT Press). ISBN 978-0-262-60073-6. [*Tech & Society* in syllabus]

Sismondo, Sergio (2010) *An Introduction to Science and Technology Studies, Second Edition* (Malden, MA: Wiley-Blackwell Publishing). ISBN 978-1-4051-8765-7. [*Intro to STS* in syllabus]

Skloot, Rebecca (2010) *The Immortal Life of Henrietta Lacks* (New York: Broadway Paperbacks). ISBN 978-1-4000-5218-9.

Other articles and book chapters will be available on Blackboard or on DropBox for download. You may print one copy of these readings and/or save them electronically for your personal use. Readings will not be available on the course website after the end of the semester in order to respect copyright practices.

IV. Assignments and evaluation

Summary

15%	Class participation
15%	Presentation of readings and facilitation of class discussion
20%	Analytic Reading Memos (5)
20%	“STS and my field” reflections (5)
25%	Critical Analysis of published STS paper
5%	Peer Review of another student’s Critical Analysis

In evaluating student work, I rely upon the following scale:

- A (90-100%) Meets all expectations of an assignment, achieving superior quality in several aspects, and demonstrates serious effort to engage course material.
- B (80-89.9%) Meets expectations of the assignment and demonstrates significant effort.
- C (70-79.9%) Fails to meet some expectations of assignment but demonstrates reasonable effort.
- D (60-69.9%) Seriously fails to meet most expectations of assignment.
- F (0-59.9%) Inadequate attention to assignment expectations, fails to engage with course materials and concepts.

Detailed description

1. **Class participation.** Show up prepared for class, engage in discussion, ask questions, dare to be wrong, help others get involved, listen to your peers, and share your ideas respectfully. The time each week in discussion represents the only meaningful difference between taking

the course and simply using the syllabus as a private reading list. Preparation for class (reading, thinking, and writing) is essential to all participants' intellectual development, as well as to the experience of their classmates. While I acknowledge the great diversity in levels of comfort with speaking in front of a group, if you are not doing so at least once per class, you are not meeting my expectations. If you feel especially shy, I encourage you to prepare questions or comments in advance. You will not be punished or humiliated for being "wrong" or asking a "dumb question." At the same time, each of you should strive to make contributions that connect to course materials, demonstrate analysis or synthesis, and marshal specific evidence for an argument. I will evaluate your participation in two ways: 1) my subjective assessment of the quality of your participation over the whole semester, 2) a one page self-evaluation of your own participation (including a proposed grade), submitted in hard copy on the last day of class.

2. **Reading presentation and discussion facilitation.** Depending on class size, each student will take one or two turns (alone or with a partner) in presenting the assigned readings to the class. Presenters should aim to emphasize new points/arguments, clarify connections to previous weeks' themes, and suggest ways that assigned readings are in conversation with one another. Initial presentations should be 15-25 minutes and may include visuals or other helpful materials. The second part of the assignment involves preparing a plan to initiate and facilitate class discussion. You might plan a small group exercise, prepare a list of discussion questions, initiate a role play, or consider other creative ideas. You will be responsible for approximately 90 minutes of class time, although if discussion remains fruitful (and depending upon other tasks scheduled for class) we may extend the discussion.
3. **Analytic Reading Memos (ARMs).** During the second class meeting, students will sign up for 5 weeks to complete analytic reading memos (not during a week that you are presenting). In 1½ to 2 pages, address the following with regard to ONE of the assigned readings:
 - a. *Argument:* Briefly describe the central argument made in the reading. This is not a summary, but a statement of what the author is trying to convince you is true.
 - b. *Evidence:* What types of evidence does the author use to support the main argument? How credible are the sources referenced explicitly or implicitly? What are the weaknesses or strengths of the evidence? NOTE: I am not asking you to *describe* the evidence that supports the main argument(s), but to notice and analyze the types and sources of evidence invoked by the author.
 - c. *Connection:* Connect this reading to a previously assigned or concurrent reading or to a prior class discussion. You might describe how this connection informs, challenges, or supports the current reading.
 - d. *Questions:* List three questions that the reading sparks for you. Aim for conceptual questions rather than factual questions, as these might be used in class discussion.

ARMs must be completed and submitted electronically by Monday at 9:00 AM in order to assist the student presenters/facilitators. Instructions for submitting on DropBox or Blackboard will be discussed in class.

4. **“STS and my field” reflections (SAMFRs).** During the second class meeting, students will sign up for 5 weeks to complete “STS and my field” reflections. This assignment aims to track your observations of and reactions to how our course content intersects with your professional/disciplinary/technical field. In 1½ to 2 pages, address one of the following:
 - a. Discuss one or more examples of implicit or explicit theorizing about the relationships among science, technology, and society by scientists and engineers (during meetings, at conferences, in other classes, in the media). How do such examples relate to our course thus far? Make specific connections to our readings and/or class discussions.
 - b. How do this week’s readings change your understanding of or perspective on some practice or theory in your professional/disciplinary/technical field? In other words, how is this class making you think differently about your primary intellectual pursuit and professional field? Make specific connections to one or more of this week’s readings.

Entries may be rather informal, but please write clearly and with purpose. Submit on DropBox/Blackboard and also bring a hard copy to class to turn in, as we will occasionally dedicate class time to hearing about students’ progress on these reflections.

5. **Critical Analysis** of a published STS paper. Choose a recent publication from a prominent STS journal (*Bulletin of Science and Technology Studies; Engineering Studies; Public Understanding of Science; Science and Public Policy; Science as Culture; Science, Technology and Human Values; Social Studies of Science; Technology and Culture*; or another journal approved in advance by the instructor). Please note that the CSM library’s access to these journals may be limited (e.g., STHV and SSS have “moving walls” of 3 years within JSTOR), but that the librarians can acquire and send you a PDF of almost any publication free of charge.

This assignment presents an opportunity to explore literature in STS that directly addresses an area of intellectual curiosity and/or an aspect of your primary research for your degree program. Early in the semester, each student will present a candidate article in class and then present a related article in a later week. The written analysis should focus on one of the two presented articles, ideally with some reference to the related article.

Instructions: In 1000-1500 words, critically analyze the article’s (1) contribution to knowledge, (2) persuasiveness, (3) connection to our course materials (citing at least two course readings), and (4) impact on your own thinking.

6. **Peer Review** of another student’s Critical Analysis. In 2-3 pages, provide a thoughtful balance of constructive criticism and praise for another student’s draft, paying particular attention to the four required aspects of the assignment. You may also mark up – electronically or in hard copy – the draft paper, but only your narrative will be graded.

7. **Mid-term evaluation.** Just as I will evaluate student performance throughout the semester to encourage improvement and identify particular challenges, students will also have an opportunity to evaluate my performance, *before* the end of the semester (when changes can only make a difference to future classes). During Week 6, students will be asked to complete an anonymous mid-term course evaluation to tell me what aspects of course organization, teaching style, and discussion format have been the most helpful, and also to provide any constructive criticism. I will discuss the results of this evaluation in class.

V. Resources and guidelines

Format of assignments: All written assignments should be formatted with 1 inch margins, 12pt font, and double-spaced. Citations for readings from the syllabus should simply indicate author, date, and page number if relevant [e.g., (Collins 1995: 102)]. Citations for other readings should follow the same format within the text, and also appear in a reference section at the end of the paper. You must turn in all written assignments BOTH on Blackboard/DropBox and in hard copy (at the beginning of class) unless otherwise specified.

Extensions for assignments require my permission no less than 48 hours *prior* to when the assignment is due (except in absolutely horrific circumstances). Under no circumstances will I accept assignments after the last day of class – any outstanding work will negatively affect the course grade or result in an “Incomplete.”

Academic support: Students are encouraged to seek academic support if struggling with course material. This is particularly true with first and second-year students, as they master the core curriculum. Information on Tutoring, Academic Excellence Workshops, and Academic Coaching can be found at <http://academicservices.mines.edu>.

Writing Center: The Writing Center, located in Stratton Hall 306, is available to help all members of the Mines community with writing projects at any stage of the writing process. Writing Consultants will help you understand an assignment; brainstorm, develop and organize ideas; cite sources; narrow your focus; and/or fine-tune your writing for polish, clarity, adherence to grammatical conventions, etc. You are welcome to bring in your scholarship letters, application letters, theses, dissertations, academic journal articles, resumes, cover letters, research papers, summaries, abstracts, NHV essays, EPICS writing assignments, and personal writing projects with which you would like help. To make an appointment, please visit our online scheduling system at: <http://mines.mywconline.com>. Questions can be directed to Shira Richman, Writing Center Director (srichman@mines.edu or 303-273-3484).

Disabilities: If you have a disability that could affect your participation and/or performance in this course, please contact me as soon as possible in order to discuss appropriate and helpful accommodations. Students who may qualify for disability accommodations must apply with

Student Disability Services. More detailed information can be found at <http://disabilities.mines.edu>.

Academic dishonesty will not be tolerated. If questions arise in your mind during the semester about plagiarism, appropriate citation of sources, or permitted collaboration on assignments, please initiate a discussion with me. If you find yourself contemplating an action that you would be embarrassed to disclose fully to the other students in the class or to me, I would advise you to consult with me before moving forward. Please keep in mind that instructors have a subscription to anti-plagiarism software which tracks all Mines student writing, inappropriate borrowing from internet sites, and papers-for-sale.

CSM policy defines **plagiarism** as follows: “Copying or adopting the scientific, literary, musical, or artistic composition or work of another and producing or publishing it as one’s own original composition or work. To be liable for ‘plagiarism’ it is not necessary to exactly duplicate another’s work: it is sufficient if unfair use of such work is made by lifting of substantial portion thereof, but even an exact counterpart of another’s work does not constitute ‘plagiarism’ if such counterpart was arrived at independently.” The LAIS plagiarism policy requires that:

- For a first offense, the student will receive an F in the course, and the Vice President for Student Life and Dean of Students will be notified.
- For a second offense, the student will also receive an F in the course and further action, normally suspension from CSM, will be taken by the Vice President for Student Life and Dean of Students. The incident will also become a permanent part of the student's transcript.

VI. Course Schedule

Week 1/Aug 23 – Introductions and film

Student and instructor introductions

Review of syllabus

Discussion of reading strategies in social science

Film (“Silent Spring” or “Day After Trinity” – both available on YouTube.com) and discussion

Week 2/Aug 30 – Case Study: HeLa Cells

- *The Immortal Life of Henrietta Lacks*. Read: Prologue, Chapters 1-8, 12-14, 17, 18, 20-27, 32, and the Afterword (~150 pages total). Note: Cast of characters listed on pp. 329-333.

Sign-ups for student presentation/facilitation, Analytic Reading Memos (ARMs), “STS and my field” Reflections (SAMFRs), and Critical Analysis article presentations (first and second rounds).

Discuss sample ARMs

Week 3/Sep 6 – STS beginnings

- *Intro to STS*, Read the Preface and Chapters 1-3, 5, 6.
- Mitroff, Ian I. (1974) "Norms and Counter-Norms in a Select Group of the Apollo Moon Scientists: A Case Study of the Ambivalence of Scientists." *American Sociological Review* 39(4): 579-95.

DUE: ARM on Mitroff (1974) – bring hard copy to class for discussion

Week 4/Sep 13 – Laboratory Studies

- *Intro to STS*, Ch. 10
- Latour, Bruno and Steve Woolgar (1986 [1979]) *Laboratory Life: The Construction of Scientific Facts* (Princeton University Press). Read Introduction and Chapter 2 ("An Anthropologist Visits the Laboratory") (pages 11-14, 43-90).
- Kleinman, Daniel Lee (1998) "Untangling Context: Understanding a University Laboratory in the Commercial World." *Science, Technology, and Human Values* 23 (3): 285-314. [You may skip the section entitled, "Theory and Method" on pp. 286-91].

DUE: STS and my field reflection (SAMFR)

Week 5/Sep 20 – Technology and society

- *Tech & Society – Part II intro* (p. 93-5), Ch. 7, 8, 11

DUE: Critical Analysis Article 1 Presentations

Week 6/Sep 27 – Actor-network theory

- *Intro to STS*, Ch. 8 (pp. 81-92)
- Callon, Michel (1999 [1985]). Some Elements of a Sociology of Translation: Domestication of the scallops and the fishermen of St. Brieuc Bay. *The Science Studies Reader*. M. Biagioli. New York, Routledge: 67-83.
- Latour, Bruno (2009 [1992]). Where Are the Missing Masses? The Sociology of a Few Mundane Artifacts. *Tech & Society*, 151-80.

Mid-course evaluations (in class)

DUE: Critical Analysis Article 1 Presentations (Cont'd)

Week 7/Oct 4 – Technology and values

- *Tech & Society – Part III intro* (p. 205-7), Ch. 13, 15, 18, 25

Week 8/Oct 11 – Controversy studies

- *Intro to STS*, Ch. 11 (pp. 120-135)
- Collins, Harry M. 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*, R. Wallis (ed.), University of Keele Press: 237-69.

- Delborne, Jason A. (2008) "Transgenes and Transgressions: Scientific Dissent as Heterogeneous Practice." *Social Studies of Science* 38(4): 509-41.

FALL BREAK – NO CLASS / Oct 18

Week 9/Oct 25 – Engineering and Social Justice

Guest: Professor Juan Lucena, LAIS

- Nieuwma, Dean (2011) Engineering, Social Justice, and Peace: Strategies for Pedagogical, Curricular, and Institutional Reform [ASEE Paper].
- Riley, Donna M. (2011) We've Been Framed! Ends, Means, and the Ethics of the Grand(iose) Challenges [ASEE Paper].

DUE: Critical Analysis Article 2 Presentations

Week 10/Nov 1 – Sociotechnical systems

- *Tech & Society*, Ch. 19, 20, 21, 23

DUE: Critical Analysis Article 2 Presentations (Cont'd)

Week 11/Nov 8 – Science and Activism

Guest: Professor Daniel Teitelbaum, ESE, Emeritus

- Allen, Barbara L. (2004) "Shifting Boundary Work: Issues and Tensions in Environmental Health Science in the Case of Grand Bois, Louisiana." *Science as Culture* 13 (4): 429-48.
- Martin, Brian (1996) "Sticking a Needle into Science: The Case of Polio Vaccines and the Origin of AIDS," *Social Studies of Science* 26 (2): 245-276. Available at <http://www.uow.edu.au/arts/sts/bmartin/pubs/96sss2.html>
- Delborne, Jason and Wyatt Galusky (2011) "Toxic Transformations: Constructing Online Audiences for Environmental Justice," in *Technoscience and Environmental Justice* (MIT Press).

Week 12/Nov 15 – Gender and STS

- *Intro to STS*, Ch. 4, 7 (pp. 36-46, 72-80)
- *Tech & Society*, Ch. 12
- Martin, Emily (1991) "The Egg and the Sperm: How Science Has Constructed a Romance Based on Stereotypical Male-Female Roles." *Signs* 16(3): 485-501.
- Chimba, Mwenya and Jenny Kitzinger (2010) "Bimbo or boffin? Women in science: an analysis of media representations and how female scientists negotiate cultural contradictions." *Public Understanding of Science* 19: 609-25.

DUE: Critical Analysis draft for peer exchange

Week 13/Nov 22 – Public understanding of science

- Wynne, Brian (1996). Misunderstood Misunderstandings: Social Identities and Public Uptake of Science. *Misunderstanding Science? The Public Reconstruction of Science and Technology*. A. Irwin and B. Wynne. Cambridge, Cambridge University Press: 19-46.
- Epstein, Steven (1995). “The Construction of Lay Expertise: AIDS Activism and the Forging of Credibility in the Reform of Clinical Trials.” *Science, Technology & Human Values* 20(4): 408-437.
- Kleinman, Daniel Lee, Jason A. Delborne, and Ashley Anderson (2011) “Engaging citizens: The high cost of citizen participation in high technology.” *Public Understanding of Science* 20 (2): 221-40

DUE: Peer review of critical analysis (bring two hard copies to class)

Week 14/Nov 29 – 21st Century challenges

- *Tech & Society*, Part V Intro (pp. 441-3), Ch. 27, 28, 29, 34
CSM course evaluations (in-class)

Week 15/Dec 6 – Course wrap-up

If convenient, we will meet at Jason’s house for class, followed by a potluck dinner.

DUE: Critical Analysis

DUE: One page self-assessment of class participation