

I400/I590/G440/G540: Geographies of Technology

Spring 2011

Thursdays 2:30 - 5pm

Informatics East Room 122

Instructors

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Wednesday 1:30-3:30pm

Sign up for office hours on office door

Course Description

How do technologies and ideas move from one setting to another? How do political relations, regulatory institutions, economic policies, cultural norms, differing ideas of property, or colonial relationships shape processes of innovation, knowledge generation, and technological change?

This course will study how ideas and technologies travel, with a focus on how these flows are interrupted or redirected in unexpected, yet productive ways.

The course will be interdisciplinary in scope (with readings from history, anthropology, sociology, geography, and science and technology studies (STS)), and is designed for students who want to broaden their understanding of how science and technology function in different cultural, political, economic, and geographical contexts.

Objectives

By the end of this class students will be able to:

- 1) Understand and critique conventional models of technology and knowledge transfer.
- 2) Develop an interdisciplinary understanding of technology and knowledge production.
- 3) Participate in the intellectual community of the Mellon Sawyer Seminar.
- 4) Express their ideas clearly in writing.

Grading

Students will be responsible for completing the assigned readings prior to class and participating in class discussion. In addition, all students must prepare 2-3 questions that they would like to discuss during class. These questions must be posted on Oncourse by 5pm on Wednesday.

Twice during the semester, graduate students will also be responsible for preparing a 4-5 page response paper and will take a leadership role in structuring the first part of class discussion that week. To do this, students will identify connections among the readings, propose questions for discussion and be prepared to summarize the argument of each of the assigned readings.

Undergraduate students will submit a 750-1000 word midterm paper responding to the first capstone workshop. This paper will identify a key theme raised during the capstone workshop and discuss how that theme was addressed by one or more of the invited speakers and in at least one of the readings.

Students will submit a final paper on a) original research relating to the course that integrates course readings and themes or b) a paper that critically engages course readings and identifies new questions or areas for future research. Graduate students will submit a 15-20 page paper. Undergraduates will submit a 7 page paper.

Graduate students:

Weekly questions	20%
Response (x2)	20%
Participation	30%
Final paper	30%

Undergraduates:

Weekly questions	20%
Participation	30%
Midterm paper	20%
Final paper	30%

Sawyer Seminar

The course will be linked to the year-long Mellon Sawyer Seminar "Rupture and Flow: The Circulation of Technoscientific Facts and Objects" that will take place at Indiana University during the 2010-2011 academic year. Students will have the unique opportunity to read and then interact with the leading scholars brought to campus for the Sawyer Seminar.

Students are required to attend the two capstone Sawyer workshops that will take place during the spring semester (<http://sawyer.indiana.edu>).

Books to purchase:

- Hayden, Cori. 2003. *When Nature Goes Public: The Making and Unmaking of Bioprospecting in Mexico*. Princeton, NJ: Princeton University Press.
- Sunder Rajan, Kaushik. *Biocapital*. Durham, NC: Duke University Press, 2006
- Soto Laveaga, Gabriela. *Jungle Laboratories*. Durham, NC: Duke University Press, 2009.
- Brown, Phil, and Edwin J. Mikkelsen. 1990. *No Safe Place: Toxic Waste, Leukemia, and Community Action*. Berkeley, CA: University of California Press
- Mirowski, Philip. 2011. *ScienceMart*. Harvard University Press.
- Shapin, Steven. 2008. Chps. 4-7 in *The Scientific Life: A Moral History of a Late Modern Vocation*. Chicago: University of Chicago Press.

All other readings are available on Oncourse.

Reading list

Week 1. January 13th: Introduction

- Eric Schatzberg, "Technik Comes to America: Changing Meanings of *Technology* before 1930," *Technology and Culture* 47 (2006): 486-512.

Week 2. January 20th: Technology and Western Dominance

- Michael Adas, *Machines as the Measure of Men*, Chapter 4: Attributes of the Dominant: Scientific and Technological Foundations for the Civilizing Mission, pp. 199-270.
- Walter Lafeber, "Presidential Address: Technology and U.S. Foreign Relations," *Diplomatic History* 24, No. 1 (Winter 2000): 1-19.
- Michael Adas, "The Paradox of Technological Supremacy," *Dominance by Design: Technological Imperatives and America's Civilizing Mission*, pp. 385-415.
- Nick Cullather, "Modernization Theory," in *Explaining the History of American Foreign Relations*, Michael J. Hogan, Thomas G. Paterson, eds. (Cambridge University Press, 2004: 212-220.
- Daniel Headrick, "Technology, Imperialism, History," *Tools of Empire*, pp. 3-14.
- Arturo Escobar, *Encountering Development: The Making and Unmaking of the Third World*, Chapter 2 (excerpt): pp. 31-54.

Week 3. January 27: Technological Diffusion

- Clapperton Mavhunga, "Firearms Diffusion, Exotic and Indigenous Knowledge Systems in the Lowveld Frontier, South Eastern Zimbabwe 1870-1920," *Comparative Technology Transfer and Society*, 1, No. 2 (August 2003): 201-231.
- Gabrielle Hecht, "Rupture-talk in the Nuclear Age: Conjugating Colonial Power in Africa," *Social Studies of Science* 32, No. 5-6 (October -December 2002): 691-728.
- Ross Bassett, "Aligning India in the Cold War Era: Indian Technical Elites, the Indian Institute of Technology at Kanpur, and Computing in India and the United States," *Technology and Culture* 50, No. 4 (October 2009): 783-810.

- Everett Rogers, "Elements of Diffusion" and "Contributions and Criticisms of Diffusion Research," *Diffusion of Innovations*, Fifth edition, (New York: Free Press, 2003), chapter 1 and chapter 3.

Week 4. February 3: Science and Technology in Comparative Contexts

- Susan Greenhalgh, "Missile Science, Population Science: The Origins of China's One Child Policy," *The China Quarterly*, 2005: 253-276.
- Eden Medina "Designing Freedom, Regulating a Nation: Socialist Cybernetics in Allende's Chile," *Journal of Latin American Studies* 38 (2006): 571-606.
- Slava Gerovitch, "Cybernetics in Rebellion," *From Newspeak to Cyberspeak*, (Cambridge: MIT Press, 2002) Chapter 4, pp. 153-198.
- Paul Edwards, "From Operations Research to the Electronic Battlefield" and "Machine in the Middle: Cybernetic Psychology in World War II," *The Closed World*, (Cambridge: MIT Press, 1996), chapter 4 and chapter 6.

Week 5. February 10th: Biotechnology and Capitalism

- Kaushik Sunder Rajan, *Biocapital*, (Durham: Duke University Press, 2006), Introduction, chaps 1, 2 and 5.
- Stefan Helmreich, "Species of Biocapital," *Science as Culture*, 17, No. 4, (2008): 463 – 478.
- Michel Foucault, "Right of Death and Power over Life," In *The Foucault Reader*, Paul Rabinow, ed. (New York: Pantheon, 1984), pp. 258-272.
- Optional: Nikolas Rose, "The Politics of Life Itself." *Theory, Culture & Society* 18, No. 6, (2001): 1-30.

Week 6. February 17th: Science, Technology and the Laboratory

- Gabriela Soto Laveaga, *Jungle Laboratories* (Durham: Duke University Press, 2009).
- Bruno Latour, "Give Me a Laboratory and I Will Raise the World," *The Science Studies Reader*, Mario Biagoli ed., pp. 258-275.

*****February 19 -- Capstone Workshop: Attendance Mandatory*****

Week 7. February 24th: The Power of Numbers

- Nick Cullather, "The Foreign Policy of the Calorie," *American Historical Review*, April 2007: 337-364.
- Richard K. Ashley, "The Eye of Power: The Politics of World Modeling," *International Organization* 37, no. 3 (1983) 495-535.
- Ted Porter, "U.S. Army Engineers and the Rise of Cost-Benefit Analysis," in *Trust in Numbers*, pp. 148-189.
- James Scott, "Nature and Space," *Seeing Like a State*, chapter 1, pp. 11-52.
- Bruno Latour, "Centres of Calculation," *Science in Action*, chapter 6.
- Optional: Michel Foucault, "Governmentality," in *The Foucault Effect*, pp. 87-104.

Week 8. March 3rd: Truth Spots

- Reading TBD: Speaker Tom Gieryn

Week 9. March 9th: Creating Science Outside the Academy: Political and Epistemological Implications

- Barnett, Ronald. 2005. Re-opening research: New amateurs or new professionals? In *Participating in the knowledge society*, edited by R. Finnegan. New York, NY: Palgrave Macmillan.
- Chapters 4 and 10 in Fischer, Frank. 2000. *Citizens, experts, and the environment: The politics of local knowledge*. Durham, NC: Duke University Press.
- Haraway, Donna. 1991. "Situated Knowledges: The Science Question in Feminism and the Privilege of Partial Perspective," pp. 183-202 in *Simians, Cyborgs, and Women: The Reinvention of Nature*. New York: Routledge.
- Verran, Helen, and David Turnbull. 1995. "Science and Other Indigenous Knowledge Systems." In *Handbook of Science and Technology Studies*, edited by S. Jasanoff, G. E. Markle, J. C. Petersen and T. Pinch. Thousand Oaks: Sage.

Week 10. March 17th: Spring Break

Week 11. March 24th: Citizen Science, Now and Then (Don't panic: these readings are mostly very short!)

- Chs 1,2, 3 and 9 Keeney, Elizabeth B. 1992. *The Botanizers: Amateur scientists in Nineteenth Century America*. Chapel Hill, NC: University of North Carolina Press.
- Ch. 2, "The Rise to Fashion" in Allen, David Elliston. 1976. *The Naturalist in Britain*. London: Penguin.
- Greenwood, Jeremy J.D. 2005. Science with a team of thousands: The British Trust for Ornithology. In *Participating in the knowledge society*, edited by R. Finnegan. New York, NY: Palgrave Macmillan.
- Cohen, J. P. (2008). Citizen science: Can volunteers do real research? *BioScience*, 58(3), 192-197.
- Eaton, M., Gregory, R., & Farrar, A.
- (2002). Bird conservation and citizen science counting, caring and acting. *Ecos*, 23(3-4), 5-13.
- Mims, Forrest M. III. 1999. Amateur science - strong tradition, bright future. *Science* 284 (2):55-6.
- Primack, R. B., Miller-Rushing, A. J., & Dharaneeswaran, K. (2009). Changes in the flora of Thoreau's Concord. *Biological Conservation*, 142(3), 500-508.
- Trumbull, D. J., Bonney, R., Bascom, D., & Cabral, A. Thinking scientifically during participation in a citizen-science project. *Science Education*, 84(2), 265-275.
- Lakshminarayanan, S. (2007). Using Citizens to Do Science Versus Citizens as Scientists. *Ecology and Society*, 12(2), 2.

Week 12. March 31st: Indigenous Ecological Knowledge

- Leach, M., & Fairhead, J. (2002). Manners of contestation: "Citizen science" and "indigenous knowledge" in West Africa and the Caribbean. *International Social Science Journal*, 54(173), 299-312.
- Graddy, Garrett. (in review) Traditional Ecological Knowledge, or: The (Social Re)production of Seeds, Space & Expertise. *Annals of the Association of American Geographers*.

- Nadasdy, Paul. 1999. The politics of TEK: Power and the "integration" of knowledge. *Arctic Anthropology* 36 (1-2):1-18.
- Hayden, Cori. 2003. Chs 1- 4 in *When Nature Goes Public: The Making and Unmaking of Bioprospecting in Mexico*. Princeton, NJ: Princeton University Press.

Week 13. April 7th: Creating Knowledge in the Environmental Justice Movement

- Ottinger, Gwen. 2010. "Buckets of Resistance: Standards and the Effectiveness of Citizen Science." *Science, Technology, and Human Values* 35(2): 244 – 270
- Brown, Phil, and Edwin J. Mikkelsen. 1990. *No Safe Place: Toxic Waste, Leukemia, and Community Action*. Berkeley, CA: University of California Press.

Week 14. April 14th: Creating knowledge in the Private Sector

- Shapin, Steven. 2008. Chs. 4-7 in *The Scientific Life: A Moral History of a Late Modern Vocation*. Chicago: University of Chicago Press.
- Kirsch, Stuart. 2010. Sustainable Mining. *Dialectical Anthropology* 34/1:87-93.
- Randalls, S. 2010. Weather profits: Weather derivatives and the commercialization of meteorology. *Social Studies of Science* 40(5), 705-730

Week 15. April 21st: The Role of Neoliberalism

- Lave, R., Philip Mirowski, and Samuel Randalls. 2010. Introduction: STS and Neoliberal Science. *Social Studies of Science* 40 (5):659-703.
- Mirowski, Philip. 2011. *ScienceMart*. Harvard University Press.

*****April 23 -- Capstone workshop: Attendance Mandatory *****

Week 16. April 28th: Wrap up

Final Papers due Monday May 2 @ 5pm