

Course Info
Ricks Hall 120
3.0 Semester Units
Tuesday 1:30-4:15pm
Spring Semester 2013

Contact Info
Dr. Booker: mmbooker@ncsu.edu
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Dr. Kinsella: wjkinsel@ncsu.edu
Office Hours: By appointment

COURSE OVERVIEW

Description

This course provides students with a framework for understanding the two-way relationships between emerging and evolving technologies and their social and cultural contexts. Social and cultural factors influence the emergence, adoption and evolution of technologies, while technologies impact society and culture in anticipated and unanticipated ways. Understanding this dynamic is crucial to successful technology management and a necessary point of engagement between biological and social science students. The course therefore presents real-world case studies, ethnographic accounts, and theoretical perspectives that introduce students to established issues and research methods for learning about "on the ground" conditions that constrain and enable technologies.

Course Goals

Upon completion of this course, students will be able to:

1. Understand science as a social process situated within social, cultural and policy contexts.
2. Appreciate how social and cultural factors enable and constrain scientific innovations such as GPM.
3. Recognize the broader social and political implications of scientific and technical developments.
4. Develop an ethical framework for evaluating the professional responsibilities of GPM researchers.
5. Assess technological risks of GPM from diverse social and cultural perspectives.
6. Build communication competencies for interaction with multiple publics, stakeholder groups and government officials.

In order to encourage the development of these capabilities among students, the course will focus on four over-arching questions:

1. What is "new" about new technologies?
2. How does one make apparent the existing norms/assumptions of current scientific research?
3. How are perspectives from the Humanities & Social Sciences useful to genetic engineering and society (more generally) and to your own work (more specifically)?
4. How do you situate yourself within the ethics of GPM?

Seminar Requirements

The prerequisite for this course is graduate standing. Attendance and participation in class sessions is required. All written assignments must be typed (12-point font; Times New Roman or Arial) and double-spaced.

(1) Required Readings

We will be covering a great deal of material over the semester, including research published in books, peer-reviewed journals, and book chapters. The three required books should be purchased as soon as possible from the NC State bookstore or other retailer. These are

- Bacon, Francis (2012/1620). *The new Atlantis*. ISBN: 1475217471
- Carson, R. (2002/1962). *Silent spring*. Boston: Houghton Mifflin. ISBN: 0618249060
- Connerton, P. (2009). *How modernity forgets*. New York: Cambridge University Press. ISBN: 0521745802
- Kuhn, T. (2012/1962). *The structure of scientific revolutions* (4th ed.). Chicago, IL: University of Chicago Press. ISBN: 0226458121
- Rist, G. (2009/1997). *The history of development: From Western origins to global faith* (3rd ed.). London: Zed Books. ISBN: 1848131895

All additional readings will be available on the course Moodle page in electronic format.

(2) Weekly discussion forum (main topic contribution of 250 words per week; weekly response of 100 words to two students' topic contributions)

The discussion forum provides an open arena for engaged discussion of the week's readings. The precise topic students write about may vary—for example, it could be how the readings relate to their own research or it could focus on a particularly difficult concept they encountered—but should be written in a coherent and comprehensive style. Ten response papers are due over the course of the semester. Students' topic contributions should be submitted to the Moodle discussion forum by **11:59pm Sunday before class**. Responses to other students' topic contributions must be submitted by **11:59pm Monday before class**.

(3) Discussion leadership

Each student will be required to act as discussion leader for one class session over the semester. In this role, the student is expected to have (1) read all contributions to the Moodle forum, and (2) generated a list of important topics and questions for discussion. The list of discussion questions should be posted to Moodle before the class session.

(4) Seminar paper (20-25 pages, excluding tables, figures, and references)

The final paper for the seminar should locate the student's own standpoint within the broader course material. The over-arching questions listed above are a point of departure for this paper. Students are also welcome to re-examine or re-contextualize the course material in light a different orienting question or proposition of their own choosing.

A prospectus for the paper is due in class on **February 26 at 1:30pm**. A completed draft of the paper is due in class on **April 2 at 1:30pm**. The final paper is due via e-mail by **May 9, 2013 at 9:00pm**.

(5) Final class presentation (15 minutes, plus up to 10 minutes for Q&A)

The last week of the course and the final examination period will be dedicated to providing each student with a forum in which to present his or her paper to the class. The presentation should be in the style of a conference paper, with an oral report of research..

Grading

Grades are determined based upon participation in the online forum (20%), participation in class discussions and as discussion leader (20%), and the final paper and presentation (60%).

Absence Policy

Per University regulations, excused absences must fall into one of two categories: sanctioned anticipated situations or documented emergency situations. Anticipated situations (e.g., participation in official University functions, court attendance, religious observances, or military duty) must be submitted in writing at the beginning of the semester or one week prior to the anticipated absence. Emergency absences (e.g., student illness, injury or death of immediate family member, must be documented by the Student Organization Resource Center 515-3323) within one week following the emergency. Make-up work will be allowed only in situations where absences were excused. Please consult the following website for further information on University attendance regulations:

http://www.ncsu.edu/policies/academic_affairs/courses_undergrad/REG02.20.3.php

Academic Integrity

Strict standards of academic honesty will be enforced according to the University policy on academic integrity found in the code of student conduct. NC State students are bound to an honor code, which states: "I have neither given nor received unauthorized aid on this test or assignment." It is my understanding and expectation that a student's signature on any test or assignment means that you have neither given nor received unauthorized aid.

We will pay special attention to the principles of academic integrity and the specific guidelines for proper use of source material in this course. My goal is not only to prevent plagiarism and cheating, but to present academic integrity to you as a positive set of values and as an integral aspect of professional norms to which you should adhere at NC State and elsewhere in the professional world.

We reserve the right to check your assignments for plagiarism by using such Internet tools as Google and Turnitin.com. By enrolling in this course, you grant me permission to upload your work or portions of it to such web sites for evaluation if we deem it necessary.

Students who plagiarize any portion of their assignments will be reported to the Office of Student Conduct and will receive a zero for the assignment, which will result in a failing grade for the course.

Please carefully read the pertinent segments of the NCSU Code of Student Conduct online:

http://www.ncsu.edu/policies/student_services/student_discipline/POL11.35.1.php. If you have questions about proper use of sources and other issues of academic integrity, consult the website of the Office of Student Conduct: http://www.ncsu.edu/student_conduct/. Or call its Director, Mr. Paul Cousins: (919) 515-2963.

Americans With Disabilities Act (ADA)

Reasonable accommodations will be made for students with verifiable disabilities. In order to take advantage of available accommodations, students must register with Disability Services for Students at 1900 Student Health Center, Campus Box 7509, 515-7653. For more information on NC State's policy on working with students with disabilities, please see the Academic Accommodations for Students with Disabilities Regulation (REG02.20.1) (http://www.ncsu.edu/policies/academic_affairs/courses_undergrad/REG02.20.1.php)

Incomplete and Late Assignments

Missed assignments and presentations cannot be made up except in documented cases of serious illness, family crisis, or participation in an official University event, as defined by NCSU regulations. We understand that you may have job conflicts, family demands, pre-scheduled medical appointments, car problems, misunderstandings about the course requirements or schedule, etc. Although these may be good reasons for

missing an assignment due date, they will not result in your being able to make up the missed points. Points earned for incomplete assignments will be reduced in proportion to the degree to which the assignment was completed. For example, an exam requiring three essays, with only one essay completed, will earn one third of the essay point total. Points earned for late assignments will be reduced by 50% if received within 24 hours of due date and time due. Assignments received later will not be accepted unless in accordance with the excused absence policy as referenced above.

Incomplete Grade Policy

Students will not be given a temporary grade of IN (incomplete) unless they have attended classes regularly for most of the semester, have completed at least 60% of required work, have missed required work as a result of factors beyond their control, and have submitted satisfactory documentary evidence. An IN grade not removed by the end of the next semester in which the student is enrolled or by the end of twelve months, whichever is earlier, will automatically become an F (unless the student can present a compelling, well-documented case for the extension). For the NC State policy on grading and IN grades, see http://www.ncsu.edu/policies/academic_affairs/grades_undergrad/REG02.50.3.php.

Departmental Equity Statement

All persons, regardless of age, race, religion, gender, physical disability, or sexual orientation shall have equal opportunity without harassment in Department of Communication courses and programs. Any harassment should be reported immediately to either the classroom instructor or the department head.

Course Evaluation

Online class evaluations will be available for students to complete during the last 2 weeks of the semester. Students will receive an email message directing them to a website where they can login using their Unity ID and complete evaluations. All evaluations are confidential; instructors will not know how any one student responded to any question, and students will not know the ratings for any instructors. Websites and contact information can be found below.

- Evaluation website: <https://classeval.ncsu.edu/>
- Student help desk: classeval@ncsu.edu
- More information about ClassEval: <http://www.ncsu.edu/UPA/classeval/>

SCHEDULE OF COURSE TOPICS

PART I. INTRODUCTION: SOCIAL, CULTURAL, AND HISTORICAL EPISTEMOLOGIES

Week 1. Techniques of Remembering and Forgetting (January 8)

- Assmann, A. "Canon and archive."
- Connerton, P. (2009). *How modernity forgets*. New York: Cambridge University Press.
- Evan-Pritchard, E. E. *The Nuer: A description of the modes of livelihood and political institutions of a Nilotic people*.
- Goody, J. "Memory in oral and literate traditions."
- Halbwachs, M. *The Collective Memory*.
- Nietzsche, F. "On the uses and disadvantages of history for life."
- Schudson, M. "The past in the present versus the present in the past."
- Sennett, R. "Disturbing memories."
- Connerton, P. *How societies remember*.

Notice that most of these readings are about three pages long. You might consider developing and annotated bibliography for these and all your graduate readings.

Week 2. Early Perspectives on Science & Technology Studies (January 15)

- Lecture on Foucault, presented by Dr. Nora Haenn
- Barbour, M. (1996). Ecological fragmentation in the fifties. In Cronon, W. (ed.). *Uncommon ground: Rethinking the human place in nature* (pp. 233-255). New York: W. W. Norton.
- Kuhn, T. (2012/1962). *The structure of scientific revolutions* (4th ed.). Chicago, IL: University of Chicago Press.
- Merton, R. K. (1973). The normative structure of science. In *The sociology of science: Theoretical and empirical investigations* (pp. 267-280). Chicago, IL: University of Chicago Press.
- Merton, R. K. The Matthew effect in science. In *The sociology of science: Theoretical and empirical investigations* (pp. 439-459).
- Mitroff, I. 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), 579-595.

Week 3. Ethical Perspectives on New Technologies (January 22)

- Guest instructor Dr. David Auerbach, Department of Philosophy and Religious Studies [requires confirmation]

PART II. SCIENCE AND TECHNOLOGY AS SOCIAL INSTITUTIONS: RISKS, KNOWLEDGE, AND INTERDISCIPLINARITY (LED BY DR. KINSELLA)

Week 4. Perspectives on science, technology, society, culture, risk, and politics. (January 29)

- Bacon, Francis (2012/1620). *The new Atlantis*.
- Bush, Vannevar (1945). *Science, the endless frontier*.
- Winner, Langdon. (1977). Frankenstein's problem. In L. Winner, *Autonomous technology: Technics-out-of-control as a theme in political thought*. Cambridge, MA: MIT Press.
- Beck, U. (1992). *Risk society: Towards a new modernity*. Newbury Park, CA: Sage.
 - "On the Logic of wealth distribution and risk distribution"
 - "Science beyond truth and enlightenment?"
- Salomon, Jean-Jacques (2000). Science, technology, and democracy. *Minerva* 38, 33–51.

Week 5. Contemporary risk society: Analyzing, communicating, managing, distributing, and governing scientific and technological risks. (February 5)

- Renn, O. (2008). *Risk governance: Coping with uncertainty in a complex world*. London: Earthscan.
 - "The challenges of complexity, uncertainty and ambiguity pre- assessment and assessment"
 - "Risk regimes: Risk communication from risk management to risk governance"
- Goodnight, G. Thomas (1982). The personal, technical, and public spheres of argument: A speculative inquiry into the art of public deliberation. *Journal of the American Forensic Association* 18, 214-227.
- Fisher, W. R. (1994). A case: Public moral argument. In R. Anderson, K. N. Cissna, & R. C. Arnett (Eds.), *The reach of dialog: Confirmation, voice, and community* (pp 173-177). Columbia: University of South Carolina Press.
- Fischer, Frank (1999) Technological deliberation in a democratic society: The case for participatory inquiry. *Science and Public Policy*, 26(5), 294-302.
- Wynne, Brian (2007). Risky delusions: Misunderstanding science and misperforming publics in the GE crops issue. In Ian Taylor (Ed.), *Genetically engineered crops: Interim policies, uncertain legislation* (pp. 341-373). New York: Haworth Food & Agricultural Press.

Week 6. Interdisciplinary knowledge production, research organization, and collaboration. (February 12)

- Nowotny, Helga, Scott, Peter, & Gibbons, Michael (2003). Introduction: 'Mode 2' revisited: The new production of knowledge. *Minerva*, 41(3), 179–194.
- Students work individually or in 2-person teams to select and present one of the five additional articles from the *Minerva* special issue:
 - De la Mothe, John (2003). Re-thinking policy in the new republic of knowledge. *Minerva*, 41(3), 195-205
 - Edqvist, Olle (2003). Layered science and science policies. *Minerva*, 41(3), 207-221.
 - Jasanoff, Sheila (2003). Technologies of humility: Citizen participation in governing science. *Minerva* 41, 223–244.
 - Pestre, Dominique (2003). Regimes of knowledge production in society: Towards a more political and social reading. *Minerva*, 41(3), 245-261.
 - Strathern, Marilyn (2003). Re-describing society. *Minerva*, 41(3), 263-276.
- Wilson, G., & Herndl, C. G. (2007). Boundary objects as rhetorical exigence: Knowledge mapping and Interdisciplinary cooperation at the Los Alamos National Laboratory. *Journal of Business and Technical Communication*, 21(2), 129-154.
- Callon, Michel. (1986). Some elements of a sociology of translation: Domestication of the scallops and the fishermen of Saint Brieuc Bay. In John. Law, Power, action and belief: a new sociology of knowledge? (pp. 196-223). London: Routledge.

Additional readings on nuclear energy:

- Cohn, Steven Mark (1997). *Too cheap to meter: An economic and philosophical analysis of the nuclear dream*. Albany: State University of New York Press.
 - Ch. 1. Introduction.
 - Ch. 4. The creation of promotional realms of discourse: A sociology of nuclear knowledge.
- Jasanoff, Sheila, & Kim, Sang-Hyun (2009). Containing the atom: Sociotechnical imaginaries and nuclear power in the United States and South Korea. *Minerva*, 47, 119-146.
- Kinsella, W. J. (2012). Environments, risks, and the limits of representation: Examples from nuclear energy. *Environmental Communication: A Journal of Nature and Culture*, 6(2), 251-259.

PART III. LEARNING FROM HISTORY: FROM ENVIRONMENTAL HAZARDS TO ENVIRONMENTAL CONSCIOUSNESS (LED BY DR. BOOKER)

Week 7. Theme #1 (February 19)

Week 8. Theme #2 (February 26)

Week 9. Theme #3 (March 12)

Readings from Matthew:

- Carson, R. (2002/1962). *Silent spring*. Boston: Houghton Mifflin. Chapters 1-3 and 10-12, "A Fable for Tomorrow," 13-15; "The Obligation to Endure," 16-23; "Elixirs of Death," 24-43; "Indiscriminately from the Skies," 141-156; "Beyond the Dreams of the Borgias," 157-167; and "The Human Price," 167-178.
- Copleston, John F. "Controversies over Pesticides: The Lessons for Public Health," *Asia-Pacific Journal of Public Health* 1989-Vol 3 No. 2.
- Dunlap, Thomas. DDT, Silent Spring, and the Rise of Environmentalism. University of Washington Press, 2008.
- Dunlap, Thomas. DDT: Scientists, Citizens and Public Policy. Princeton U. Press, 1981.
- Feacham, Richard and Oliver Sabot. "A New Global Malara Reduction Strategy." *Lancet* 2008. Vol. 371: 1633–35
- Kelly-Hope, Louise, Hilary Ranson, Janet Hemingway. "Lessons from the past: managing insecticide resistance in malaria control and eradication programmes." *Lancet Infect Dis* 2008; 8: 387–89
- Kerr, J. Austin, "Lessons to be Learned from Failures to Eradicate." *A.J.P.H.* January 1963. 53 (1): 27-30.

- Najera, Jose, et al. "Some Lessons for the Future from the Global Malaria Eradication Programme (1955–1969)." *PLOS Medicine* January 2011 8 (1): 1-7.
- Kinkela, David. *DDT and the American Century*. UNC Press, 2011.
- Russell, Edmund, *War and Nature: Fighting Humans and Insects with Chemicals from World War I to Silent Spring*. Cambridge, 2001: 1-16; 145-235.
- Schapera, Allan. "DDT: a polluted debate in malaria control." *Lancet* December 16, 2006. Vol 368: 2111-2112.
- Stapleton, Darwin H. "Lessons of History? Anti-Malarial Strategies of the International Health Board and the Rockefeller Foundation from the 1920s to the era of DDT." *Public Health Reports* March–April 2004. Volume 119
- Stapleton, Darwin. "Historical Perspectives on Malaria: The Rockefeller Antimalarial Strategy of the 20th Century." *Mount Sinai Journal of Medicine*. 2009. 76:468-473.
- Turpin, F. Tom. "Management of Insect Pests During the Past 50 Years: Lessons Learned." *Proceedings of the Illinois Crop Protection Technology Conference*, Jan. 5-6, 2000: 62-63.

Readings from Fred:

- Lear, Linda. 1997. *Rachel Carson: Witness for Nature*.
- John H. Perkins 1982. *Insects, experts, and the insecticide crisis: The quest for new pest management strategies*.
- Dale G. Bottrell a, □, Kenneth G. Schoenly 2011. Resurrecting the ghost of green revolutions past: The brown planthopper as a recurring threat to high-yielding rice production in tropical Asia. *Journal of Asia-Pacific Entomology* 15 (2012) 122–140

NO CLASS MARCH 5 (SPRING BREAK)

PART IV. HISTORY OF DEVELOPMENT AND UNFORESEEN CONSEQUENCES OF NEW TECHNOLOGIES (LED BY DR. HAENN)

Week 10. History of development. (March 19)

- Rist, G. (2009/1997). *The history of development: From Western origins to global faith* (3rd ed). London: Zed Books.
- DeVries, P. (2007). Don't compromise your desire for development! A Lacanian/Deleuzian rethinking of the anti-politics machine. *Third World Quarterly* 28(1), 25-43.

Week 11. Theme #2 (March 26)

Week 12. Theme #3 (April 2)

Readings for Themes #2 and #3:

- Cullather, Nick. *The Hungry World: America's Cold War Battle Against Poverty in Asia*. Harvard University Press, 2010. Chapter 2, "Mexico's Way Out," and Chapter 6, "A Parable of Seeds," Chapter 8, "The Meaning of Famine," Chapter 9, "The Conquest of Hunger."
- Easterbrook, Gregg. "Forgotten Benefactor of Humanity" *The Atlantic Monthly* 279, no. 1 (January 1997): 75-82. Pairs well with Somini Sengupta.
- Fitzgerald, Deborah. *Every Farm a Factory: The Industrial Ideal in American Agriculture*. New Haven, CT, USA: Yale University Press, 2003. Introduction; Chapter 1, "The Industrial Ideal in American Agriculture"; and Chapter 2, "By the Numbers: Economics and Management in Agriculture," 1-74.
- Parayil, Govindran. "The Green Revolution in India: A Case Study of Technological Change." *Technology and Culture*, Vol. 33 (1992): 737–756.
- John H. Perkins. *Geopolitics and the Green Revolution: Wheat, Genes, and the Cold War* (New York: Oxford University Press, 1997).
- Scott, James C. ~~Scott, Seeing Like a State: How Certain Schemes to Improve the Human Condition Have Failed. New Haven: Yale University Press, 1998. Chapter 1, "Nature and Space," 11-52.~~

- Sengupta, Somini. "On India's Farms, a Plague of Suicide," *New York Times*, September 19, 2006.
- Wharton Jr., Clifton R. "The Green Revolution: Cornucopia or Pandora's Box?" *Foreign Affairs* 47, no. 3 (April 1, 1969): 464–476.

Additional readings from Fred:

- B. H. Farmer Editor 1977. *Green revolution? : Technology and change in rice-growing areas of Tamil Nadu and Sri Lanka*
- Lipton, M. with Longhurst, R. (1989) *New Seeds and Poor People* (London: Unwin Hyman).
- Hazell, P. B. R. Ramasamy, C. 1991. *The Green Revolution reconsidered*. Johns Hopkins Univ Press
- John H. Perkins. 1997. *Geopolitics and the green revolution : wheat, genes, and the cold war*. New York : Oxford University Press.
- Gordon Conway. 1998. *The Doubly Green Revolution: Food for All in the Twenty-First Century* (Comstock Book)
- Paul B. Thompson, ed.,. 2008. *The Ethics of Intensification: Agricultural Development and Cultural Change* (Berlin: Springer Science + Business Media)

PART V. UNDERSTANDING PUBLIC OPINION OF SCIENCE AND TECHNOLOGY (LED BY DR. ANDREW R. BINDER)

Week 13. Origins of public opinion: Education, values, and mass media (April 9)

- Brossard, D., & Shanahan, J. (2007). Perspectives on communication about agricultural biotechnology. In D. Brossard, J. Shanahan & T. C. Nesbitt (Eds.), *The public, the media, and agricultural biotechnology: An international casebook* (pp. 3-20). Cambridge, MA: CABI.
- Dudo, A., Brossard, D., Shanahan, J., Scheufele, D. A., Morgan, M., & Signorielli, N. (2011). Science on television in the 21st century: Recent trends in portrayals and their contributions to public attitudes toward science. *Communication Research*, 38(6), 754-777.
- Lewenstein, B. V. (1995). Science and the media. In S. Jasanoff, G. E. Markle, J. C. Petersen & T. Pinch (Eds.), *Handbook of science and technology studies* (pp. 343-360). Thousand Oaks, CA: Sage.
- Miller, J. D. (1998). The measurement of civic scientific literacy. *Public Understanding of Science*, 7(3), 203-223.
- Rudolph, J. L. (2005). Epistemology for the masses: The origins of "the scientific method" in American schools. *History of Education Quarterly*, 45(3), 341-376.

Week 14. Consequences of public opinion: Public engagement and discourse about emerging technologies (April 16)

- Guest instructor Dr. Michael Cobb, Department of Political Science [confirmed]
- Binder, A. R., Cacciatore, M. A., Scheufele, D. A., Shaw, B. R., & Corley, E. A. (2012). Measuring risk/benefit perceptions of emerging technologies and their potential impact on communication of public opinion toward science. *Public Understanding of Science*, 21(7), 830-847.
- Cobb, M. D. (2005). Framing effects on public opinion about nanotechnology. *Science Communication*, 27(2), 221-239.
- Downs, A. (1972). Up and down with ecology: The issue-attention cycle. *Public Interest* 28, 38-50.
- Nisbet, M. C., Brossard, D., & Kroepsch, A. (2003). Framing science: The stem cell controversy in an age of press/politics. *Harvard International Journal of Press-Politics*, 8(2), 36-70.

PART VI. CONCLUSIONS

Week 15. Final Presentations (April 23)

Final Exam Period: Tuesday May 7, 1-4pm