

History of Science 133: *Biology and Society,* *1950–today*

Professor Nicole Nelson

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Office hours: M 1:00–3:00, or by appointment

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Spring 2014

Ingraham 19

MW 11:00–11:50, plus discussion section

From medical advancements to environmental crises and global food shortages, biology and the life sciences are implicated in some of the most pressing social issues of our time. This course explores events in the history of biology from the mid-twentieth century to today, and examines how developments in this scientific field have shaped and are shaped by society. The course is divided into three thematic units. In the first unit, we investigate the origins of the institutions, technologies, and styles of practice that characterize contemporary biology; such as the use of mice as “model organisms” for understanding human diseases. In the second unit, we delve into areas of biology that have raised controversies about regulation, governance, and public participation; such as the introduction of genetically modified plants into the food supply. The final unit asks how biological facts and theories have been and continue to be used as a source for understanding ourselves. Within the units, each week begins with an examination of an historical event or controversy that provides an entry into a discussion about how biology and society interact. The creation of a cloned sheep named Dolly and the ensuing media coverage and controversy, for example, demonstrates how new reproductive technologies are challenging fundamental categories that we use to describe the life course such as “parent” and “offspring.”

The course content is delivered through two lectures and one discussion section per week. Students will also read a selection of historical, sociological, and popular articles each week in preparation for class, which will be contextualized and discussed in lecture and section. Evaluation will be based on the quality of students’ participation in section, a short writing assignment, a critical thinking assignment, and midterm and final exams. This course will help students in the sciences, social sciences,

or humanities to develop the analytical and writing skills needed to confront complex social issues involving the life sciences. No prior knowledge of biology, history, or social theory is required.

Course Objectives

After successfully completing the course you will:

- be able to describe and understand the significance of key people and events in the recent history of biology;
- understand key theoretical frameworks for describing interactions between biology and society, and be able to apply these frameworks to new empirical cases
- be able to identify and evaluate the strength of the argument and evidence used in an academic paper;
- be able to identify and employ the conventions of academic writing, generate their own original argument in writing, and use revision techniques to strengthen their argument;
- an appreciation for how historical and sociological analysis can reveal ways in which the institutions, practices, and ways of thinking associated with contemporary biology are specific to a particular place and time (and could have been otherwise!)

Course materials

Course readings will be available as a course pack at the Social Science Copy Center (6120 Social Science Building, 1180 Observatory Drive). A copy of the course pack will also be available on reserve at the College Library (Helen C. White). I will make all lecture slides available for download after each lecture on the Learn@UW website.

Assignments and grading

<i>Assignment</i>	<i>% of final grade</i>	<i>Due date</i>
Section participation and exercises	25%	throughout full term
Reading summary assignment	15%	as assigned in section
Midterm exam	20%	March 12, 2014
Critical thinking assignment	15%	April 25, 2014, 5:00 pm
Final exam	25%	to be announced

The grade for *discussion section* will be based on a combination of attendance and the quality of students' participation in class discussions and in-class exercises. Students are expected to arrive at discussion sections having read the assigned readings for the week and ready to participate in discussion. You *must* clear in advance any legitimate reasons for absences with the instructor, and make-up

exercises will not be allowed in the case of unexcused absences. Discussion section will also include a number of short writing exercises that will help you to better understand the course material and prepare for upcoming exams and assignments. These exercises will be completed in class and require no additional preparation other than reading the assigned articles. You will receive a letter grade for your overall participation in section by your section leader. Midway through the course, you will receive detailed feedback on your discussion participation.

The *reading summary* assignment asks you to summarize the topic, argument, and evidence used in one of the assigned readings, and to make your own evaluation of the argument and evidence presented. The assignment has two parts: a short written summary and an oral presentation in section, to develop both writing and presentation skills. Students may choose to do their reading summary at different time points throughout the course (a list of eligible course readings and a schedule will be distributed in section), and the assignment will be due on the day that the selected assigned reading is due in section. This assignment will receive a letter grade from the section leader. Your section leader will distribute and discuss a more detailed description of the assignment and a grading rubric in section.

In the *critical thinking assignment*, you will take a theoretical framework learned from the course and use it to understand a new empirical case in a short writing assignment. These essay questions will ask you to take a theoretical framework learned from the course, and use it to understand a new empirical case. Grading for this assignment will place particular emphasis on your ability to create and defend an original academic argument. Your section leader will distribute a more detailed grading rubric along with the essay prompts in section. Late papers will be penalized one letter grade (e.g., A to AB) per day unless you have made prior arrangements with the section leader.

The midterm and final exams will contain a combination of identification questions (IDs) where you have to identify and state the significance of a person, event, or concept from the course; short answer questions; and essay questions. I will distribute a study aid with a list of example IDs in class prior to the exam. The grading scale used for the exams is as follows:

A = 93–100%, AB = 88–92%, B = 83–87%, BC = 78–82%, C = 70–77%, D = 60–69% F = 0–59%

Course policies

Because of the size of the course, my ability to answer questions via email is limited. Please visit me at my office hours or ask questions in the discussion forum on the Learn@UW website. If you are unable to meet during my scheduled office hours, email me to arrange an alternative meeting time.

I am happy to discuss academic accommodations for students with disabilities. If you think you may qualify for accommodation, please contact the McBurney Disability Resource Center to establish your eligibility for services. If you already have a McBurney visa, please present it within the first three weeks of the semester so that appropriate arrangements can be made, except if there are unusual circumstances.

All students are expected to adhere to the University of Wisconsin—Madison's core values regarding academic integrity. Plagiarism or other academic misconduct may result in a zero on the assignment or exam, a lower grade in the course, or failure in the course. See the Dean of Students Office web-

site for more information about the academic misconduct process (<http://students.wisc.edu/doso/acadintegritty.html>).

Course schedule

January 22: Course Introduction

No assigned readings or sections for this week

January 27 and 29: Historical narratives and origin stories about contemporary biology

- Kary Mullis. 2000. *Dancing naked in the mind field*. Vintage Books, January, pp. 3–14
- Paul Rabinow. 1996. *Making PCR : a story of biotechnology*. Chicago: University of Chicago Press, pp. 1–18

Unit One: The institutions and social practices of biology

February 3 and 5: From big physics to big biology (post WWII)

- Park Doing. 2009. *Velvet Revolution at the synchrotron biology, physics, and change in science*. Inside technology. Cambridge, MA: The MIT Press, pp. 1–21

February 10 and 12: Model organisms – *C elegans* (1963)

- Soraya de Chadarevian. 1998. “Of Worms and Programmes: *Caenorhabditis Elegans* and the Study of Development.” *Studies in History and Philosophy of Science Part C* 29 (1): 81–105
- Rachel A. Ankeny and Sabina Leonelli. 2011. “What’s so special about model organisms?” *Studies In History and Philosophy of Science Part A* 42 (2): 313–323. doi:10.1016/j.shpsa.2010.11.039

February 17 and 19: University-Industry relations – Bayh Dole Act (1980)

- Mark Peter Jones. 2009. “Entrepreneurial Science: The Rules of the Game.” *Social Studies of Science*:821–851. doi:10.1177/0306312709104434
- Steven Shapin. 2003. “Ivory Trade.” *London Review of Books* 25, no. 17 (September): 15–19

February 24 and 26: Reshaping the clinic – BRCA genes (1994, 1995)

- Pascale Bourret. 2005. “BRCA Patients and Clinical Collectives New Configurations of Action in Cancer Genetics Practices.” *Social Studies of Science* 35 (1): 41–68. doi:10.1177/0306312705048716

- Shobita Parthasarathy. 2010. “Assessing the social impact of direct-to-consumer genetic testing: Understanding sociotechnical architectures.” *Genetics in Medicine* 12 (9): 544–547. doi:10.1097/GIM.0b013e3181e71c70

February 26: Guest lecture by Prof. Don Waller, John T. Curtis Professor of Botany and Chair of the Department of Botany, on personal genome sequencing

Unit Two: Governance and participation in biology

March 3 and 5: Toxic landscapes and environmental politics – Silent Spring (1962)

- Gregg Mitman. 2007. *Breathing space: how allergies shape our lives and landscapes*. New Haven: Yale University Press, pp. 130–166
- Kim Fortun and Mike Fortun. 2005. “Scientific Imaginaries and Ethical Plateaus in Contemporary U.S. Toxicology.” *American Anthropologist* 107 (1): 43–54. doi:10.1525/aa.2005.107.1.043

March 10: Regulation of biotechnology – Asilomar (1975)

- Sheila Jasanoff. 2005. *Designs on nature: science and democracy in Europe and the United States*. Princeton, N.J.: Princeton University Press, pp. 42–67

March 12: In-class midterm exam

No sections this week.

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March 15–23: March break

March 24 and 26: The popularization of genetics – The Human Genome Project (1990)

- Dorothy Nelkin and Susan Lindee. 2000. “The DNA mystique: the gene as a cultural icon.” In *Perspectives in medical sociology*, 3rd ed., edited by Phil Brown, 406–424. Prospect Heights, IL: Waveland
- Martin Richards. 2006. “Heredity: Lay Understanding.” In *Living with the genome: ethical and social aspects of human genetics*, edited by Angus Clarke and Flo Ticehurst, 177–182. Houndmills, Basingstoke, Hampshire [England]; New York: Palgrave Macmillan

March 31 and April 2: Who gets to participate in biology? – GM Nation (2003)

- Brian Wynne. 1992. “Misunderstood misunderstanding: social identities and public uptake of science.” *Public Understanding of Science* 1 (3): 281–304. doi:10.1088/0963-6625/1/3/004
- Ionat Zurr and Oron Catts. 2005. “Big pigs, small wings: on genotype and artistic autonomy.” *Culture Machine* 7

- Browse the “Pig Wings Project” http://www.tca.uwa.edu.au/pig/pig_main.html

Unit 3: Biology and the Self

April 7 and 9: Seeing humanity through evolution – Sociobiology (1975)

- Carl N Degler. 1991. *In Search of Human Nature: The Decline and Revival of Darwinism in American Social Thought*. New York: Oxford University Press, pp. 215–244
- Donna Jeanne Haraway. 1989. *Primate visions: gender, race, and nature in the world of modern science*. New York: Routledge, pp. 244–258

Critical thinking assignment distributed in section this week

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April 14 and 16: Neuroscience and the Decade of the Brain (1990)

- Ilina Singh. 2005. “Will the “real boy” please behave: dosing dilemmas for parents of boys with ADHD.” PMID: 16006369, *The American Journal of Bioethics: AJOB* 5 (3): 34–47. doi:10.1080/15265160590945129
- Scott Vrecko. 2010. “Birth of a brain disease: science, the state and addiction neuropolitics.” *History of the Human Sciences* 23 (4): 52–67. doi:10.1177/0952695110371598

April 21 and 23: Reproductive technologies – Dolly the cloned sheep (1997)

- Charis Thompson. 2001. “Strategic naturalizing: kinship in an infertility clinic.” In *Relative values: reconfiguring kinship studies*, edited by Sarah Franklin and Susan McKinnon, 175–202. Durham, NC: Duke University Press

April 25: Paper assignment due

You have to submit your paper by 5:00 pm.

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April 28 and 30: Race as a scientific category? – BiDil (2005)

- Anne Pollock. 2012. *Medicating race: heart disease and durable preoccupations with difference*. Experimental futures : technological lives, scientific arts, anthropological voices. Durham: Duke University Press, pp. 155–179
- Duana Fullwiley. 2006. “Biosocial Suffering: Order and Illness in Urban West Africa.” *BioSocieties* 1 (4): 421–438. doi:10.1017/S1745855206004042

May 5 and 7: Globalizing biology

- Nicholas B. King. 2004. "The Scale Politics of Emerging Diseases." *Osiris* 19 (January): 62–76. doi:10.2307/3655232
- Howard Markel. 2012. "Censorship Hinders Influenza Research." *The New York Times* (February 1). <http://www.nytimes.com/2012/02/02/opinion/censorship-hinders-influenza-research.html>

TBA: Final exam

Date and time for final exam to be announced

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