

HH1004: Science and Technology in Historical Perspective (2026-27, Sem 1)

Course Outline

Instructor: Taylor Coplen

Learning Objective: This is a thematic survey in the history of science and technology. Students are expected to explore diverse historical problems in science and technology in the global and local contexts. Through this course, students will be able to understand the importance of science and technology in creating modernity. They are also expected to learn how science and technology are located in the cultural landscape of our society, which shapes and is shaped by knowledge and practice in laboratories, factories, and fields. Students will thus find that science and technology are closely associated with what we do not usually think in related terms, such as religion, political ideologies, morality, gender, entertainment, and even magic.

Course Structure:

3 Hour Weekly Seminar

Assignment and Evaluation:

Seminar Attendance and Quiz (15%)

Seminar Participation (15%)

Midterm Essay (20%)

Final Exam (50%) – Nov 30th

Week 1

The Standard Narrative: From Superstition to Science and Technology

Comte, Auguste. "Account of the Aim of This Work: View of the Nature and Importance of the Positive Philosophy." In *The Positive Philosophy of Auguste Comte*, p 1-3. London: John Chapman, 1853.

Wootton, David. *The Invention of Science: A New History of the Scientific Revolution*. New York: HarperCollins, 2015. Introduction and Chapter 1.

Bush, Vannevar. *Science, the Endless Frontier: A Report to the President*. Washington, DC: United States Government Printing Office, 1945. "Summary of the Report," 1–4.

Week 2

What Is the History of Science? Kuhn and the Critique of Progress

Morus, Iwlyn Rhys "Introduction" in *Oxford Illustrated History*

Kuhn, Thomas S. "Introduction: A Role for History." In *The Structure of Scientific Revolutions*, 4th ed., 1–9. Chicago: University of Chicago Press, 2012.

Shapin, Steven. 2007. "Science and the modern world." In *The Handbook of Science and Technology Studies*, edited by E.J. Hackett, O. Amsterdamska, M. Lynch and J. Wacjman, 433-448. Cambridge, MA: MIT Press.

Londa Schiebinger, "Why Mammals Are Called Mammals: Gender Politics in Eighteenth-Century Natural History," *American Historical Review* 98, no. 2 (April 1993): 382-411.

Week 3

Ancient Science and Technology across the Mediterranean and Near East

Evans, James. "Science in the Ancient Mediterranean World." In *The Oxford Illustrated History of Science*, edited by Iwan Rhys Morus, 9-44. Oxford: Oxford University Press, 2017.

Rochberg, Francesca. "Introduction: The Ancient Near East, Science, and Nature." In *Before Nature: Cuneiform Knowledge and the History of Science*, 1-14. Chicago: University of Chicago Press, 2016.

Renn, Jürgen. 2015. "From the History of Science to the History of Knowledge – and Back." *Centaureus* 57 (1): 37-53 (Only read p. 47-50)

Freeth, Tony, et al. "Decoding the Ancient Greek Astronomical Calculator Known as the Antikythera Mechanism." *Nature* 444 (2006): 587-591.

Week 4

Knowledge in Ancient China

Harper, Donald. "Science in Ancient China." In *The Oxford Illustrated History of Science*, edited by Iwan Rhys Morus, 45-71. Oxford: Oxford University Press, 2017.

Stanley-Baker, Michael. "Qi 氣: A Means for Cohering Natural Knowledge." In *Routledge Handbook of Chinese Medicine*, edited by Vivienne Lo and Michael Stanley-Baker. Abingdon: Routledge, 2022.

Sivin, Nathan. "Why the Scientific Revolution Did Not Take Place in China, or Didn't It?" *Chinese Science* 5 (1982): 45-66.

Week 5

Knowledge in Motion: Translation, Travel, and Exchange

Brentjes, Sonja. "Medieval Science in the West and Middle East." In *The Oxford Illustrated History of Science*, edited by Iwan Rhys Morus, 72-107. Oxford: Oxford University Press, 2017.

Sabra, A. I. "The Appropriation and Subsequent Naturalization of Greek Science in Medieval Islam." *History of Science* 25 (1987): 223-243.

Chase, Kenneth. "Introduction." In *Firearms: A Global History to 1700*, Cambridge: Cambridge University Press, 2003.

Week 6

Was There a Scientific Revolution?

Henry, John. "The Scientific Revolution." In *The Oxford Illustrated History of Science*, edited by Iwan Rhys Morus, 143–179. Oxford: Oxford University Press, 2017.

Osler, Margaret J. "The Canonical Imperative: Rethinking the Scientific Revolution." In *Rethinking the Scientific Revolution*, edited by Margaret J. Osler, 3–22. Cambridge: Cambridge University Press, 2000.

Shapin, Steven. "The House of Experiment in Seventeenth-Century England." *Isis* 79, no. 3 (1988): 373–404.

Week 7

Where Is Scientific Knowledge Made? Empire, Colony, and Circulation

Basalla, George. "The Spread of Western Science." *Science* 156, no. 3775 (1967): 611–622.

Raj, Kapil. "Beyond Postcolonialism ... and Postpositivism: Circulation and the Global History of Science." *Isis* 104, no. 2 (2013): 337–347.

Barnard, Timothy P. "The Economic Garden." In *Nature's Colony: Empire, Nation and Environment in the Singapore Botanic Gardens*, 114–152. Singapore: NUS Press, 2016. (selections)

Soto Laveaga, Gabriela. "Introduction." In *Jungle Laboratories: Mexican Peasants, National Projects, and the Making of the Pill*, 1–22. Durham, NC: Duke University Press, 2009.

Week 8

Gender, Situated Knowledge, and Objectivity

Daston, Lorraine, and Peter Galison. "Epistemologies of the Eye." In *Objectivity*, New York: Zone Books, 2007.

Haraway, Donna. "Situated Knowledges: The Science Question in Feminism and the Privilege of Partial Perspective." *Feminist Studies* 14, no. 3 (1988): 575–599.

Martin, Emily. "The Egg and the Sperm: How Science Has Constructed a Romance Based on Stereotypical Male-Female Roles." *Signs* 16, no. 3 (1991): 485–501.

Week 9

What Is Technology? Artifacts, Social Change, and Tacit Knowledge

Cook, Scott D. N. "The Structure of Technological Revolutions and the Gutenberg Myth." In *New Directions in the Philosophy of Technology*, edited by Joseph C. Pitt, 63–83. Philosophy and Technology 11. Dordrecht: Springer, 1995.

Pinch, Trevor J., and Wiebe E. Bijker. "The Social Construction of Facts and Artifacts." *Social Studies of Science* 14, no. 3 (1984): 399–441. Selected sections on the bicycle.

Shapin, Steven. "The Invisible Technician." *American Scientist* 77, no. 6 (1989): 554–563.

Sismondo, Sergio. "Two Questions Concerning Technology." In *An Introduction to Science and Technology Studies*, 2nd ed., 93–105. Chichester: Wiley-Blackwell, 2010. Read 93–96.

Week 10

Technology and Political Power

Winner, Langdon. "Do Artifacts Have Politics?" In *The Whale and the Reactor: A Search for Limits in an Age of High Technology*, 19–39. Chicago: University of Chicago Press, 1986.

Foucault, Michel. "Panopticism." In *Discipline and Punish: The Birth of the Prison*, translated by Alan Sheridan, 195–228. New York: Vintage Books, 1995. Selections

Ezrahi, Yaron. "Science and the Making of Representative Actions." In *The Descent of Icarus: Science and the Transformation of Contemporary Democracy*, 41–48. Cambridge, MA: Harvard University Press, 1990.

Week 11

Technology, Labor, and Control

Braverman, Harry. "The Division of Labor." In *Labor and Monopoly Capital: The Degradation of Work in the Twentieth Century*, 25th anniversary ed., 49–58. New York: Monthly Review Press, 1999 [1974].

Biggs, Lindy. "The Engineered Factory." *Technology and Culture* 36, no. 2, supplement (1995): S174–S188.

Marglin, Stephen A. "What Do Bosses Do? The Origins and Functions of Hierarchy in Capitalist Production." *Review of Radical Political Economics* 6, no. 2 (1974): 60–112

Week 12

Infrastructure: The Hidden Systems of Everyday Life

Hughes, Thomas P. "Introduction." In *Networks of Power: Electrification in Western Society, 1880–1930*, 1–17. Baltimore: Johns Hopkins University Press, 1983.

Star, Susan Leigh. "The Ethnography of Infrastructure." *American Behavioral Scientist* 43, no. 3 (1999): 377–391.

Anand, Nikhil. "Pressure: The PoliTechnics of Water Supply in Mumbai." *Cultural Anthropology* 26, no. 4 (2011): 542–564.

Week 13

Technology in the Contemporary World: Computing, Digital Platforms, and AI

Forsythe, Diana E. "Engineering Knowledge: The Construction of Knowledge in Artificial Intelligence." *Social Studies of Science* 23, no. 3 (1993): 445–477.

Hu, Tung-Hui. "Introduction." In *A Prehistory of the Cloud*, ix–xxix. Cambridge, MA: MIT Press, 2015.

Hicks, M. (2021). When did the fire start? In T. S. Mullaney, B. Peters, M. Hicks, & K. Philip (Eds.), *Your Computer Is on Fire* (pp. 11–26). The MIT Press.