HH1004: Science and Technology in Historical Perspective (2019-2020, SEM 2)

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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:

2 Hour Weekly Lecture + 1 Hour Weekly Tutorial

Assignment and Evaluation:

Lecture Attendance and Quiz (15%)
Lecture Participation (5%)
Midterm Essay (15%) – by 7 March
Tutorial Activity (15%)
Final Exam (50%) – on 29 April

Lecture Readings

Main text: Andrew Ede and Lesley Cormack, *A History of Science in Society: From Philosophy to Utility* (Toronto: University of Toronto Press, 2017).

Week 1 (15 January): Course Introduction and the Stories on Ancient Societies

Ede and Cormack, *History of Science in Society*, pp. 1-39.

Martin Bernal, "Animadversions on the Origins of Western Science," *Isis* 83 (1992), pp. 596-607.

Jürgen Renn, "From the History of Science to the History of Knowledge – and Back," *Centaurus* 57 (2015), pp. 47-50 (out of 37-53).

Week 2 (22 January): Science in the Medieval Islamic and European World

Ede and Cormack, *History of Science in Society*, pp. 42-56, 67-93.

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

George Ovitt, Jr., "The Cultural Context of Western Technology: Early Christian Attitude toward Manual Labor," *Technology and Culture* 27 (1986), pp. 477-500.

Week 3 (29 January): Early Modern Sciences and Their Revolutions

Ede and Cormack, *History of Science in Society*, pp. 95-167.

Mario Biagioli, "Galileo the Emblem Maker," *Isis* 81 (1990), pp. 230-258.

Steven Shapin. "The House of Experiment in Seventeenth-Century England," *Isis* 79 (1988), pp. 373-404.

Peter Dear, "Totius in Verba: Rhetoric and Authority in the Early Royal Society," *Isis* 76 (1985), pp. 145-161.

Harry Collins and Trevor Pinch, *The Golem: What Everyone Should Know about Science* (Cambridge: Cambridge University Press, 1993).

Week 4 (5 February): Science, Technology, and the Enlightenment Project

Ede and Cormack, *History of Science in Society*, pp. 169-205.

Hasok Chang, "We Have Never Been Whiggish (about Phlogiston)," *Centaurus* 51 (2009), pp. 239-264.

Ken Alder, "A Revolution to Measure: The Political Economy of the Metric System in France," in M. Norton Wise (ed.), *The Values of Precision* (Princeton: Princeton University Press, 1995), pp. 39-71.

Robert Darnton, *Mesmerism and the End of the Enlightenment in France* (Cambridge, Mass.: Harvard University Press, 1968), pp. 2-45. (https://archive.org/details/MesmerismRobertDarnton_201507/page/n41)

Week 5 (12 February): Industrial Revolution

Ede and Cormack, *History of Science in Society*, pp. 192-194, 254-257.

James E. McClellan and Harold Dorn, *Science and Technology in World History* (Baltimore: Johns Hopkins University Press, 2006), pp. 279-294.

Arnold Thackray, "Natural Knowledge in Cultural Context: The Manchester Model," *American Historical Review* 80 (1974), pp. 672-709.

Robert Allen, Jean-Pascal Bassino, Debin Ma, Christine Moll-Murata, Jan Luiten Van Zanden, "Wages, Prices, and Living Standards in China, 1738-1925: in Comparison with Europe, Japan, and India," *Economic History Review* 64 (2011), pp. 8-38.

Robert Allen, "The Great Divergence in European Wages and Prices from the Middle Ages to the First World War," *Explorations in Economic History* 38 (2001), pp. 411-447.

Week 6 (19 February): Darwinism and Imperialism

Ede and Cormack, *History of Science in Society*, pp. 207-225, 282-287.

Robert Young, "Malthus and the Evolutionists: The Common Context of Biological and Social Theory," *Past and Present* 43 (1969), pp. 109-145.

Rune Svarverud, "Social Darwinism and China's Relationship with Korea and Japan in the Late 19th and Early 20th Century," *International Journal of Korean History* 2 (2001), pp. 99-122.

Week 7 (26 February): Second Industrial Revolution

Ede and Cormack, *History of Science in Society*, pp. 232-243. 288-297, 359-360.

Misa, *Leonardo to the Internet* (Baltimore: Johns Hopkins University Press, 2011), pp. 128-150, 158-167.

George Wise, "A New Role for Professional Scientists in Industry," *Technology and Culture* 21 (1980), pp. 408-429.

Thomas Hughes, *American Genesis: A History of the American Genius for Invention* (New York: Penguin Books, 1989), pp. 184-226.

Week 8 (11 March): Science and Technology in Russia and the Soviet Union

Ede and Cormack, *History of Science in Society*, pp. 306-307, 338-343, 350-351.

Loren Graham, *Science in Russia and the Soviet Union* (Cambridge: Cambridge University Press, 1993), chapters 2-5, pp. 173-190.

Slava Gerovitch, "Stalin's Rocket Designers' Leap into Space: The Technical Intelligentsia Faces the Thaw," *Osiris* 23 (2008), pp. 189-209.

Nils Roll-Hansen, "Wishful Science: The Persistence of T. D. Lysenko's Agrobiology in the Politics of Science," *Osiris* 23 (2008), pp. 166-188.

Li Peishan, "Genetics in China: The Qingdao Symposium of 1956," *Isis* 79 (1988), pp. 227-236.

Week 9 (18 March): Science and Religion

Ede and Cormack, *History of Science in Society*, pp. 123-128.

Peter Bowler and Iwan Rhys Morus, *Making Modern Science* (Chicago: University of Chicago Press, 2005), pp. 341-366.

Shruti Kapila, "The Enchantment of Science in India," *Isis* 101 (2010), pp. 120-132.

Peter Dear, "Miracles, Experiments, and the Ordinary Course of Nature," *Isis* 81 (1990), pp. 663-683.

Week 10 (25 March): Science, Technology, and Gender

Ede and Cormack, *History of Science in Society*, pp. 356-359, 368-369, 374-377.

Bowler and Morus, *Making Modern Science*, pp. 487-509.

Evelyn Fox Keller, "Anomaly of a Woman in Physics," in Mary Wyer et al (eds.), *Women, Science, and Technology: A Reader in Feminist Science Studies* (New York: Routledge, 2001), pp. 9-16.

Margaret W. Rossiter, "'Women's Work' in Science, 1880-1910," *Isis* 71 (1980), pp. 381-398.

Week 11 (1 April): Pseudoscience in Cultural Contexts

Ede and Cormack, *History of Science in Society*, pp. 403-404.

Ronald Numbers, "Creationism, Intelligent Design, and Modern Biology," in Denis R. Alexander and Ronald L. Numbers (eds.), *Biology and Ideology from Descartes to Dawkins* (Chicago: University of Chicago Press, 2010), pp. 302-328.

Robert Pennock, "The Postmodern Sin of Intelligent Design Creationism," *Science and Education* 19 (2010), pp. 757-778.

Martin Riexinger, "Turkey," in *Creationism in Europe*, edited by Stefaan Blancke, Hans Henrik Hjermitslev, and Peter C. Kjærgaard (Baltimore: Johns Hopkins University Press), pp. 180-198.

Susan Palmer, *Aliens Adored: Raël's UFO Religion* (New Brunswick: Rutgers University Press, 2004), pp. 1-16.

Frances A. Yates, "The Hermetic Tradition in Renaissance Science," in Charles Singleton (ed.), *Art, Science, and History in the Renaissance* (Johns Hopkins University Press, 1968), pp. 255-274.

Week 12 (8 April): Science and Technology as a Threat

Ede and Cormack, *History of Science in Society*, pp. 308-316, 327-329, 337-353, 396-403.

Amy Bix, *Inventing Ourselves Out of Jobs?* (Baltimore: Johns Hopkins University Press, 2000), chapters 1, 7, 8.

Bruno Latour, "Anthropology at the Time of the Anthropocene - a Personal View of What Is to Be Studied" (lecture draft at Washington; December 2014).

Week 13 (15 April): Popular Science

Bowler and Morus, *Making Modern Science*, pp. 367-390.

Sally Gregory Kohlstedt, "Parlors, Primers, and Public Schooling: Education for Science in Nineteenth-Century America," *Isis* 81 (1990), pp. 424-445.

Ian Hacking, "Telepathy: Origins of Randomization in Experimental Design," *Isis* 79 (1988), pp. 427-451.

Tutorial Readings

Week 2: A. I. Sabra, "Situating Arabic Science: Locality versus Essence," Isis 87 (1996), pp. 654-670.

Week 3: Katharine Park and Lorraine J. Daston, "Unnatural Conceptions: The Study of Monsters in Sixteenth- and Seventeenth-Century France and England," *Past and Present* 92 (1981), pp. 20-54.

Week 4: Charles Gilliespie, "The Encyclopédie and the Jacobin Philosophy of Science: A Study in Ideas and Consequences," in Marshall Clagett (ed.), *Critical Problems in the History of Science* (Madison: University of Wisconsin Press, 1959), pp. 255-288.

Week 5: A. Roger Ekirch, *At Day's Close: Night in Times Past* (New York: Norton, 2005), pp. 300-339.

Week 6: Ronald Numbers, "That Social Darwinism Has Had a Profound Influence on Social Thought and Policy, Especially in the United States of America," in Ronald L. Numbers and Kostas Kampourakis (eds.), *Newton's Apple and Other Myths about Science* (Cambridge, Mass.: Harvard University Press, 2015), pp. 139-146.

Week 7: Stephen Meyer, *The Five Dollar Day* (Albany: State University of New York Press, 1981), pp. 123-168.

Week 8: Kirill Rossianov, "Editing Nature: Joseph Stalin and the 'New' Soviet Biology," *Isis* 84 (1993), pp. 728-745.

Week 9: Hee-Joo Park, "The Creation–Evolution Debate: Carving Creationism in the Public Mind," *Public Understanding of Science* 10 (2001), pp. 173-186.
Week 10: Ruth Cowan, *More Work for Mother: The Ironies of Household Technology* (New York: Basic Books, 1985), pp. 3-15, 192-216.
Week 11: Alexander Geppert, "Extraterrestrial Encounters: UFOs, Science, and the Quest for Transcendence, 1947-1972," *History and Technology* 28 (2012), pp. 335-362.
Week 12: Spencer Weart, "The Physicist as Mad Scientist," *Physics Today* 41 (1988), pp. 28-37.
Week 13: Gregg Mitman, "Cinematic Nature: Hollywood Technology, Popular Culture, and the American Museum of Natural History," *Isis* 84 (1993), 637-661.

Midterm Essay

The professor will assign a topic in the form of a question during the lecture. Students are expected to write an essay about it using course readings and other resources available. The content of the paper must answer the question with approximately 1,000 words, excluding footnotes and bibliography. The recommended style of the essay can be found in *Chicago Manual of Style* (available in the NTU Library). You should submit your paper to the course portal of NTULearn. After logging on, please click "Midterm Assignment." Please submit your paper by 7 March. Any late submission, along with overly long or short papers, may be subject to penalty. Please submit your file in .docx (MS word) rather than .pdf format.

What You Should Do before and during Lectures:

There will be a quiz during every lecture. This will also be used for monitoring attendance. The quiz will be based on the week's lecture readings which will be explained by the professor. Even if you do not choose the "correct answer" (only in terms of class context) for the quiz, your attendance in the lecture will still be acknowledged. But getting the right answer will let you earn extra marks (total 15%). To do so, you need to pay attention to the lectures and read the papers. Please read as much as you can, but you do not need to finish all. What you need is just to pay attention to the lecture out of which the quiz questions will be chosen. In addition, the professor will occasionally ask questions amid the lecture. You are encouraged to answer these questions and ask your own to earn credit for your "lecture participation" (5%).

Tutorials:

There are three tutorial sessions, and you need to attend just one. During the class, tutors will interact with students to talk about a paper for your better understanding of the week's subject. You are encouraged to be active during the tutorials, since your attendance and activity will be monitored and will contribute to your marks. You need to submit your discussion reports at the end of each tutorial (15% of the total).

Final Exam:

On 29 April 2020, you will take the final exam. There will be five questions reflecting the five weeks out of 13 weeks of lectures and tutorials. You will have to write down an analytic essay for each question. This is an open book exam.

How to Find Readings:

The main textbook is available in the campus bookstore, while other lecture readings and tutorial papers are available in NTULearn's course portal.

Plagiarism:

Plagiarism is a serious academic misconduct and may endanger a student's career in a highly severe way. It is done intentionally or unintentionally using another person's ideas and writings without any proper citation and/or quotation marks. Collusion, which may involve a close collaboration in completing an assignment, is another problem. Unless instructed otherwise, your midterm assignment should be done by yourself alone. Paraphrasing is an act of rewriting other people's ideas or arguments using your own words. While this is an acceptable practice in most cases, it can be an issue if you do not indicate that the ideas have come from another person's works. If you are not sure about how you should do regarding these issues, please do cite the referred sources in footnotes/endnotes and use the quotation marks around the terms you did not originally write. Even if you cited the source, your paper can be a problem without the proper use of quotation marks. If any plagiarized sentence or paragraph is detected, the grade will be reduced to zero.