

Nanyang Technological University
Semester 1, AY2018-2019

ST9001/HH9015
Science, Technology & Society
Syllabus

<Final version>

Subject Description

This is the core and introductory module for the minor in Science, Technology, and Society. The module provides an introduction to the interdisciplinary field of “Science, Technology, and Society.” We will examine the major themes and major methods and approaches used in this field. The module aims to develop a set of theoretical and methodological tools for approaching scientific and technological problems from social science and humanist perspectives. In other words, it aims to think about science and technology from the points of view of culture, society, politics, and economics.

Prerequisites: Nil
Academic Units: 3

Teaching Staff

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Attendance Requirements

Students are expected to attend one two-hour lecture and one one-hour tutorial once per week:

Lectures: Wednesdays 10.30am-12.30pm (LHS “The Hive” TR+25 (B2-02))
Tutorials: Wednesdays 12.30-1.30pm (LHS “The Hive” TR+25 (B2-02))

Since lectures and tutorials run back-to-back, we will use the time flexibly as a three-hour block. This course will be based on intensive discussion of the readings and as such you are expected to participate fully.

Medical certificates are not a get out of jail free card. Missing a seminar without an MC will mean an automatic zero for any weekly reading response for that week. Presenting

an MC confers on you the privilege of making up the grade for your missed class. Usually, this means I will ask you to write a much longer response paper on the readings for that week. The grade on this response paper will make up your attendance and participation grade for that week.

Website

The course *Blackboard* site is an important source of information for this subject. Useful resources such as this syllabus, links to further readings, details of assessment, and subject announcements will be available through this website. Check the website regularly for subject announcements and updates.

Readings

PDFs of these required readings are also available on *Blackboard*. Required readings represent the minimum expected for you to participate effectively in class.

Further recommended readings are listed on the website. These references are intended as an additional guide for research and resources for assignments.

Assessment Structure and policies

- **In-class test** (25%): To take place during class in Week 6.
- **Presentation** (group-work) (20%): Possible topics listed under each week.
- **Class participation** (25%): Based on weekly reading responses.
- **Multimedia object analysis** (30%): Based on the application of one of the “theories” of STS to a scientific or technological problem or idea.

Any assessable material that is late will lose marks at the rate of 10% (of the maximum grade) per day with the exception of weekly reading responses which will be graded zero if they are late.

It is your responsibility to ensure that you schedule presentations appropriately. Missing a scheduled in class presentation or not scheduling a presentation will result in a zero grade for the presentation.

Extensions will only be granted in very special cases and in any case will be granted only **ten days** or more in advance of a deadline.

Ensure that you follow appropriate citation conventions for all assignments and familiarize yourself with the University’s policies on plagiarism and collaboration.

Group Presentation

You will be assigned a group and asked to present once during the semester. The topics for the presentations can be found in the weekly schedule below. Your presentation should last approximately 15-20 minutes. If required, Prof. Stevens can provide you with additional readings and background material. If you wish to choose a topic that is not listed on the syllabus, please consult with Prof. Stevens. The size of the groups will depend on the total size of the class, but will likely consist of three to four students each. Each student in the group will receive the same grade for each presentation.

Mid-term Test

Examination-conditions test on material on weeks 1-5 of the course. The test will take place in the first half of the lecture session. It will be based on short "identification" questions. More details will be given closer to the date. Failure to attend the test will result in a zero grade. Except in the most serious of emergencies (as decided at the instructor's discretion), there will be no "makeups" for the mid-term test. Such a makeup would take place on a date set at the instructor's convenience in or near the final week of semester and will cover the entire 13 weeks of course material.

Week 9 (Wednesday October 24th) during lecture time, 10.30-11.30am.

Class participation

Since reading the material is a basic requirement for participation in the course, each you will be asked to submit a one-page reading response. This should discuss your interpretation of one or more of the readings. It should not be a summary of the reading, but rather include your own analysis – this could include a comparison between readings, your own views on whether you agree or disagree with the author, or your own ideas about how ideas in the readings might be applied.

Readings responses will be accepted in **hard copy only (no emails please)** and will be due at **10.35am at the beginning of class**. There will be no exceptions and no late responses will be accepted. Responses will be graded **zero (no submission), 1 (poor), 2 (acceptable), or 3 (exceptional)**.

Multimedia object analysis

The aim of this project will be to adopt one of the STS theories discussed in this class (eg. "coproduction" or "actor-network theory") and apply it to a particular **case study or object**. For instance, you might choose to examine the development of the ball-point pen, applying ideas about social construction of technology to understand its development. Or, you might choose to write about the development of nuclear weapons

by India, deploying “co-production” to understand why India chose to develop the bomb.

More suggestions for possible topics will be provided during the semester. You are encouraged to devise your own paper topic in consultation with Prof. Stevens. Especially during the second-half of semester we will devote some portion of the tutorial hour to working on the “objects.” You are also encouraged to submit a proposed topic in week 6 in order to receive feedback on it.

The final product should be a multimedia “essay.” This should include some text (**at least 1500 words**) but can also include images, video, sound, etc. These can be organized on a website of your own design. However, I’m also open to other forms of presentation if you have other ideas.

Due date: Friday November 16th, 5pm (electronic submission; text to be submitted to Turn-it-in).

Weekly Schedule

Week 1 (August 15th): Introduction: Why study science from a social perspective?

Readings: None

Week 2 (August 22nd): No class: Public Holiday.

Week 3 (August 29th): What is special about science? [HS at 4S]

Readings:

- Popper, Karl. 1959 [orig. 1934] *The Logic of Scientific Discovery*. London: Tavistock. [Chapter 1 (pp. 3-26) and Chapter 10 (pp. 248-282)]
- Godfrey-Smith, Peter. *Theory and Reality: An introduction to the philosophy of science*. [Chapter 4 (pp. 57-74)]

Presentations: Karl Popper; The Vienna Circle.

Week 4 (September 5th): Is science social?

- Merton, Robert K. 1938. “The Puritan Spur to Science” [Excerpted from *Science, Technology & Society in Seventeenth-Century England*]. In: Merton, Robert K. *The Sociology of Science: Theoretical and Empirical Investigations*. Chicago, IL: University of Chicago Press: 228-253.

- Merton, Robert K. 1942. "The Normative Structure of Science." In: Merton, Robert K. *The Sociology of Science: Theoretical and Empirical Investigations*. Chicago, IL: University of Chicago Press: 254-266.
- Merton, Robert K. 1938. "Science and the Social Order" In: Merton, Robert K. *The Sociology of Science: Theoretical and Empirical Investigations*. Chicago, IL: University of Chicago Press: 267-280.

Presentations: Robert K. Merton; Boris Hessen; Puritanism; "Protestant Ethic"; Royal Society of London.

Week 5 (September 12th): How does science progress?

Readings:

- Kuhn, Thomas. 1962. *The Structure of Scientific Revolutions*. Chicago: Chicago University Press. [Chapters III, IV, V, VI, VII, VIII, IX, X (pp. 23-135)]

Presentations:

- Epicycles; *Philosophiae Naturalis Principia Mathematica*; Michelson-Morley experiments; Charles-Augustin de Coulomb; Robert Boyle; phlogiston.

Week 6 (September 19th): Is it all relative? [HS at WEF]

Readings:

- Bloor, David. 1976. *Knowledge and social imagery*. Routledge [Chapter 1 (pp. 1-19) and Chapter 2 (pp. 20-39)].
- Barnes, Barry and David Bloor. 1982. "Relativism, rationalism, and the sociology of knowledge. In: *Rationality and relativism*. Martin Hollis and Steven Lukes, eds. Blackwell: 21-47.
- Bloor, David. 1982. "Durkheim and Mauss revisited: Classification and the sociology of knowledge" *Studies in the History and Philosophy of Science* 13: 267-97.

Presentations: *Leviathan and the Air Pump*; Emile Durkheim.

Week 7 (September 26th): Is science like war?

Readings:

- Latour, Bruno (1987) *Science in Action: How to follow scientists and engineers through society*. Cambridge: Harvard University Press. [Chapters 1, 2, and 6 (pp. 21-100 and 215-257)]

Presentations: Bruno Latour; La Perouse (Jean François de Galaup); Scallops of St. Brieuc Bay.

Mid-semester break

Week 8 (October 10th): Are objects social too? [HS at JIAS]

Readings:

- Winner, Langdon. 1980. "Do Artifacts Have Politics?" *Daedalus* 109, no. 1.
- Pinch, Trevor J. and Wiebe E. Bijker. 1984. "The social construction of facts and artefacts: or how the sociology of science and the sociology of technology might benefit each other" *Social Studies of Science* 14: 399-441.
- Mackenzie, Donald. 1998. "Nuclear Missile Testing and the Social Construction of Accuracy" In: *The Science Studies Reader*, Mario Biagioli, ed. Routledge: 342-357.
- Bijker, Wiebe E. 1995. "King of the Road: the social construction of the safety bicycle" In: *Of bicycles, bakelites, and bulbs: toward a theory of sociotechnical change*. Cambridge, Massachusetts: MIT Press: 19-100.

Presentations: Robert Moses; inertial navigation (missile guidance); social construction of Bakelite; social construction of the fluorescent light.

Week 9 (October 17th): Midterm test // object selection [HS at UC Boulder]

Week 10 (October 24th): Is science "coproduced"?

Readings:

- Jasanoff, Sheila. 2004. "Ordering knowledge, ordering society" In: *States of knowledge: The co-production of science and the social order*. Routledge: 13-45.
- Ezrahi, Yaron. 2004. "Science and the political imagination in contemporary democracies" In: *States of knowledge: The co-production of science and the social order*. Routledge: 254-273.

Presentations: Coproduction of CITES and the African elephant; coproduction of climate science; coproduction of the European Environmental Agency; coproduction in genome laboratories.

Week 11 (October 31st): Is science gendered?

Readings:

- Haraway, Donna J. 1998. "Situated knowledge: the science question in Feminism and the privilege of partial perspective." In *The Science Studies Reader*, edited by Mario Biagioli. London: Routledge: 172-188.
- Martin, Emily. 1991. "The egg and the sperm: how science has constructed a romance based on stereotypical male-female roles" *Signs* 16, no. 3: 485-501.
- Schiebinger, Londa. 2004. "Chapter 1: The Private Lives of Plants." In: *Nature's Body: Gender in the Making of Modern Science*. Rutgers University Press: 11-39.

Presentations: Women in the scientific revolution; gender and information technology.

Week 12 (November 7th): Is science western?

Readings:

- Raj, Kapil. 2000. "Colonial encounters and the forging of new knowledge and national identities: Great Britain and India, 1760-1850" *Osiris* 15: 119-134.
- Verran, Helen. 2001. *Science and African Logic*. Chicago: University of Chicago Press. [Chapter 1 (pp. 1-20) and Chapter 3 (pp. 51-70)]

Presentations: Great Divergence; *Science and Civilization in China*.

Week 13 (November 14th): Can STS help us with contemporary problems?

Readings:

- Oreskes, Naomi and Eric Conway. 2010. *Merchants of Doubt: How a Handful of Scientists Obscured the Truth On Issues from Tobacco Smoke to Global Warming*. Bloomsbury. [Chapter 6, pp. 169-215]
- Stevens, Hallam. 2015. *Biotechnology & Society: An Introduction*. University of Chicago Press [Chapter 7 and Chapter 8]

Presentations: Controversy over the ozone hole; controversy over secondhand smoke.