

Introduction to Science and Technology Studies (STS 5024)

Fall 2020

3 Credit Hours

Time: Thursday, 7-9:45PM

Locations: online only, via Zoom

Instructors:

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Description: This seminar introduces graduate students to the field of Science and Technology Studies (STS). We will address how STS differs from other fields as well as the advantages and limits of our unique interdisciplinary approach. Drawing on anthropological, historical, philosophical, and sociological methods, we will explore topics such as the foundations of scientific knowledge; science as a source of social power and authority; the making of technological systems; race, gender, and postcolonial perspectives; and public engagement with science and technology. You will become familiar with the major questions and theories that have been debated by STS scholars and learn how the field has changed over time.

Learning Objectives: The seminar prepares you to think and communicate as STS scholars. Through conversation, reading, individual written work, and collaborative presentations we will:

- articulate what STS is and what STS scholars do
- recognize, analyze, evaluate, and integrate major STS ideas and methods
- connect STS ideas and methods to other disciplines
- practice techniques of critical analysis
- engage in multi-perspectival dialogue

Requirements:

Reading: Critical engagement with the course's readings is the foundation of this class. All readings are to be completed *prior* to the weekly meeting for which they are assigned. Please purchase the following books, all other readings will be provided on Canvas:

Kuhn, Thomas S. 2012 [1962]. *The Structure of Scientific Revolutions*. 4th ed. Chicago, University of Chicago Press.

Latour, Bruno. 1987. *Science in Action: How to Follow Scientists and Engineers through Society*. Cambridge, MA: Harvard University Press.

Shapin, Steven and Simon Schaffer. 2011 [1985]. *Leviathan and the Air-Pump: Hobbes, Boyle, and the Experimental Life*. Princeton University Press.

Participation: A seminar is a shared conversation. It demands active participation from all members. You must come to every meeting having done the readings and having spent time thinking about the material prior to class. You are expected to attend every class; there is always an option to connect remotely if you cannot reschedule travel. If you absolutely cannot attend, you should contact one of the instructors well in advance, so we can work out an assignment to make up for the meeting you miss. But simply showing up is not participation. You must share your ideas and engage with those of your colleagues. In addition to regular participation, you will kick-start class discussion once during the semester (supported by us, of course). We'll provide more details in class.

Rhetorical Précis: Prior to our week 2 and 3 meetings, everyone will write short rhetorical précis (one per week) of an assigned reading. These help you accurately identify a position before critiquing or supporting it. Précises identify core content such as: Who is the author(s) and what is their relationship to STS? When was this written and what was its intellectual context? What is the author's/authors' argument (regardless of whether you agree with it or not)? Where are key passages in the text and why? What's the take-away message? Why is this on the syllabus and how does this matter for an Introduction to STS? These must be posted on Canvas ("Discussions") no later than Wednesday 7:00 pm before class.

Reading Responses: Starting with the readings for week 4, you will alternate between writing discussion questions and writing *short* (2-3 paragraphs) reading responses, which are a step up from the précis. We will divide the class into alternating groups. Those responsible for questions should post their prompts no later than Monday 7:00 pm before class. Those responding to the questions should post their responses no later than Wednesday 7:00 pm before class. Make sure you read your classmates' responses before class starts, as we will use them in our discussions. We will provide feedback the first few weeks so that we're all on the same page about length and content.

When posing discussion questions, post one or two questions about the reading that you would like others in the class to answer. As you formulate your question(s) you might consider:

- What are the most exciting or interesting points raised by the readings?
- How does one piece of the assigned readings relate to another one – is it an addition, a counter-argument, or an illustration?
- Am I persuaded by this argument?

Note: Good questions can do lots of things: e.g. they can draw our attention to overlooked issues, or bring into focus the implicit values of an author. Most of all, they are *generative*, they enhance our collective knowledge. In this context, good questions are not ones that can be answered by locating simple facts that already exist within the reading.

When writing reading reactions, you should reply to one question posed on the discussion boards. Your response should not be a summary or mere speculation or personal opinion. Rather, you should begin to identify, analyze, and evaluate arguments presented in any given text. Draw on the course readings to answer the question, and identify any points of confusion (that's a valid and important contribution!). You may also raise additional questions that arise as you attempt to answer the first question.

Mid-term Essay Exam: At a meaningful point in the semester, when we'll have covered some of the basics of the STS canon, you will compose two short essays (1500 words each). We will present you with essay prompts (you will have a choice among questions) no later than October 10, and you will have two weeks to complete this assignment (**due October 21, 11:59pm**). This is an open book exam, and you may use all readings, your notes, and course materials. What we're looking for is that you demonstrate a command of some of STS's foundational literature, and the beginnings of a critical assessment of arguments you've encountered in this course so far.

Collaborative Report on an Emerging STS Theme: As an introductory course, this class can only begin to cover the wide range of discussions in our field. To give you an opportunity to pursue some of the current exciting developments, you will team up in small groups to explore a topic of current relevance in STS. Shortly after you complete your mid-term essay, we will provide a list of potential topics (e.g. gender, bodies, and technology; engineering studies; disaster studies; the "Third Wave," etc.). You will independently coordinate this research amongst yourselves, and report back to the group during our final class meeting (December 3). Each group also will submit a final report on the research you've done, incorporating feedback you'll receive during the final class meeting. The final report is **due no later than December 15, 11:59 pm**.

We will provide detailed written instructions for the above assignments and discuss in class.

Assessment: Your grade will be based on:

20% participation

25% précis and online Q&A

25% midterm essays

30% collaborative report on emerging STS theme

Honor Code: This course follows university policies pertaining to academic honesty and plagiarism. That means **zero tolerance** for academic violations such as cheating, plagiarism, and falsification. For details, please consult the “[Plagiarism handout](#)” posted on the course website (under “Files”), or contact one of the instructors. If you any have questions please ask us, or consult the Graduate Honor

System: <https://graduateschool.vt.edu/academics/expectations/graduate-honor-system/ghs-introduction.html>.

Accommodations: If you are a student with special needs or circumstances, if you have emergency medical information to share with us, or if you need special arrangements in case the building must be evacuated, please make an appointment with us as soon as possible.

VT Principles of Community: Finally, this course affirms the Virginia Tech Principles of Community, which means that we are all responsible for a respectful climate of debate in the classroom. If you have any questions, please ask us or consult the Principles of Community: <https://www.inclusive.vt.edu/Initiatives/vtpoc0.html>.

Schedule

*****Please note: Readings listed under "additional resources" are intended to guide you toward further study and exploration. They are optional.*****

I. Introduction

Week 1. August 27. What is STS?

[Sismondo, Sergio. 2008. "Science and Technology Studies and an Engaged Program."](#) In *The Handbook of Science and Technology Studies*, edited by Hackett, et al. 3rd ed. Cambridge: MIT Press, 13-31.

Sarewitz, Daniel. 2020. ["What the Pandemic Is Telling Us About Science, Politics, and Values."](#) *Slate*, March 24, 2020.

Kathryn Johnson, Taylor Loy, David Dansereau, Maria Gomez, George Atalla, Nataliya Brantly, and Sonja D. Schmid. 2020. ["One Nation Under Lockdown,"](#) Forum "In and Beyond the Era of COVID-19," *Social Epistemology Review and Reply Collective (SERRC)*, 9 (6): 25-29.

Additional Resources:

Sismondo, Sergio. 2004. "The Prehistory of Science and Technology Studies." In *An Introduction to Science and Technology Studies*. Malden: Blackwell Publishing, 1-11.

Edwards. Paul N. 2008. "How to Read a Book, v4.0." School of Information: University of Michigan. www.si.umich.edu/~pne/.

Science, technology and society from Wikipedia.

A series of YouTube videos from the conference "Science and Technology Studies: The Next Twenty" (April 7-9, 2011) at the Harvard Kennedy School.

Fuller, Steve. 2007. *New Frontiers in Science and Technology Studies*. Cambridge, UK: Polity Press.

Hess, David J. 1997. *Science Studies: An Advanced Introduction*. New York: New York University Press.

Ulrike Felt, Rayvon Fouché, Clark A. Miller, and Laurel Smith-Doe, eds. 2017. *The Handbook of Science and Technology Studies*, 4th ed. Cambridge: MIT Press.

II. Making an (Inter)Discipline

Week 2. September 3. Debating the Nature of Science

Kuhn, Thomas S. 2012 [1962]. *The Structure of Scientific Revolutions*. 4th ed. Chicago, University of Chicago Press, 2012.

Additional Resources:

Popper, Karl. 1992 [1934]. "A Survey of Some Fundamental Problems." In *The Logic of Scientific Discovery*. London & New York: Routledge: 27-48.

Feyerabend, Paul. 1970. "Consolations for the Specialist." In *Criticism and the Growth of Knowledge*, ed. I. Lakatos and A. Musgrave. Cambridge: Cambridge University Press: 197-230.

Lakatos, Imre. "Science and Pseudoscience." Broadcast on 6/30/1973 for an Open University course on "Problems of Philosophy." <http://www.lse.ac.uk/collections/lakatos/scienceAndPseudoscience.htm>.

Fleck, Ludwig. 1979. *The Genesis and Development of a Scientific Fact*. Chicago: University of Chicago Press, 1979.

Koyré, Alexandre. 1957. *From the Closed World to the Infinite Universe*. Baltimore: Johns Hopkins University Press.

Wittgenstein, Ludwig. 1958. *Philosophical Investigations*. Oxford: Blackwell.

Week 3. September 10. Science as a Social Activity

[Merton, Robert K. 1973 \[1942\]. "The Normative Structure of Science."](#) In *The Sociology of Science: Theoretical and Empirical Investigations*. Chicago: University of Chicago Press: 267-278.

[Mulkay, Michael J. 1976. "Norms and Ideology in Science."](#) *Social Science Information* 15(4): 637-656.

[Collins, H. M. 1974. "The TEA Set: Tacit Knowledge and Scientific Networks."](#) *Science Studies* 4(2): 165-185.

[Bloor, David. \[1976\] 1991. *Knowledge and Social Imagery*.](#) Chicago and London: Chicago University Press. Chapter 1, Conclusion, Afterword.

Additional Resources:

Barnes, Barry, and David Bloor. 1982. "Relativism, Rationalism and the Sociology of Knowledge." In *Rationality and Relativism*, edited by M. Hollis and S. Lukes, 21-47. Oxford: Blackwell, 1982.

Bloor, David. 1981. "The Strengths of the Strong Programme in the Sociology of Knowledge." *Philosophy of the Social Sciences* 11: 199-213.

Collins, Harry M. 1983. "An Empirical Relativist Programme in the Sociology of Scientific Knowledge." In *Science Observed: Perspectives on the Social Study of Science*, edited by K. Knorr-Cetina and M. Mulkay, 83-113. London: Sage.

Collins, Harry M. 1992. *Changing Order: Replication and Induction in Scientific Practice*. Chicago: University of Chicago Press.

Zammito, John H. 2004. *A Nice Derangement of Epistemes: Post-positivism in the Study of Science from Quine to Latour*. Chicago: University of Chicago Press.

Week 4. September 17. Constructing Technology and Society

[Ellul, Jacques. 1965. *The Technological Society*](#). Transl. John Wilkinson. New York: Knopf, selection.

[Winner, Langdon. 1980. "Do Artifacts Have Politics?"](#) *Daedalus* 109(1): 121-136.

[Cowan, Ruth Schwartz. 1983. *More Work for Mother: The Ironies of Household Technologies from the Open Hearth to the Microwave*](#). New York: Basic Books, ch. 3.

[Pinch, Trevor J., and Wiebe E. Bijker. 2012. "The Social Construction of Facts and Artifacts, or How the Sociology of Science and the Sociology of Technology Might Benefit from Each Other."](#) In Bijker et al., *The Social Construction of Technological Systems*: 17-50.

Fouché Rayvon. 2003. [Black Inventors in the Age of Segregation: Granville T. Woods, Lewis H. Latimer, and Shelby J. Davidson](#). Johns Hopkins Studies in the History of Technology. Baltimore: Johns Hopkins University Press, selections.

Additional Resources:

Nye, David E. 1994. *American Technological Sublime*. Cambridge: MIT Press.

Ogburn, William Fielding. 1964 [1922]. *Social Change with Respect to Culture and Original Nature*. Gloucester, Mass.: Peter Smith.

[Hughes, Thomas P. 2012. "The Evolution of Large Technological Systems."](#) In *The Social Construction of Technological Systems*, edited by Bijker, et al. Cambridge: MIT Press, 51-82.

Edgerton, David. 2006. *The Shock of the Old: Technology and Global History since 1900*. Oxford, UK et al.: Oxford University Press.

Slaton, Amy. 2010. *Race, Rigor, and Selectivity in U.S. Engineering*. Cambridge, MA: Harvard University Press.

Week 5. September 24. Historicizing Truth

Shapin, Steven and Simon Schaffer. 2011 [1985]. *Leviathan and the Air-Pump: Hobbes, Boyle, and the Experimental Life*. Princeton University Press.

Additional Resources:

Hacking, Ian. 1991. "Artificial Phenomena." Review of *Leviathan and the Air Pump: Hobbes, Boyle and the Experimental Life* by Steven Shapin and Simon Schaffer. *British Journal for the History of Science* 24(2): 235-241.

Week 6. October 1. Cultures of Science and Technology

[Knorr Cetina, Karin. 1995. "Laboratory Studies: The Cultural Approach to the Study of Science."](#) In Jasanoff et al (eds.), *Handbook of Science and Technology Studies*, Revised ed. London: Sage Publications: 140-166.

[Latour, Bruno, and Steve Woolgar. 1979. *Laboratory Life: The Construction of Scientific Facts*.](#) Beverly Hills: Sage, chapters 1, 2, and 6.

Zuiderent-Jerak, Teun. 2015 ["The Stuff of Interventions: Technologies of Compliance in Hemophilia Care."](#) In *Situated Intervention: Sociological Experiments in Health Care*. The MIT Press.

Ottinger, Gwen. 2013. *Refining Expertise: How Responsible Engineers Subvert Environmental Justice Challenges*. New York and London: New York University Press, selections.

Additional Resources:

Galison, Peter. 1999. Trading Zone: Coordinating Action and Belief (1998 abridgment). In *The Science Studies Reader*, edited by Mario Biagioli, 137-160. London & New York: Routledge.

[Traweek, Sharon. 1988. *Beamtimes and Lifetimes: The World of High Energy Physicists*.](#) Cambridge, Massachusetts: Harvard University Press, selections.

[Vinck, Dominique. 2009. *Socio-Technical Complexity: Redesigning a Shielding Wall*.](#) In *Everyday Engineering: An Ethnography of Design and Engineering*, Dominique Vinck (ed.). Cambridge, MA: MIT Press, 13-27.

Week 7. October 8. The Politics of Expertise

[Nelkin, Dorothy. 1975. "The Political Impact of Technical Expertise."](#) *Social Studies of Science* 5(1): 35-54.

[Gieryn, Thomas. 1983. "Boundary-Work and the Demarcation of Science from Non-Science: Strains and Interests in Professional Ideologies of Scientists."](#) *American Sociological Review* 48(6): 781-95.

[Epstein, Steven. 1995. "The Construction of Lay Expertise: AIDS Activism and the Forging of Credibility in the Reform of Clinical Trials."](#) *Science, Technology, & Human Values* 20(4): 408-437.

[Oreskes, Naomi. 2004. "The Scientific Consensus on Climate Change." *Science* 306 \(3\) December: 1686.](#)

[Guston, David H. 2007. "The Center for Nanotechnology in Society at Arizona State University and the Prospects for Anticipatory Governance." In *Nanoscale: Issues and Perspectives for the Nano Century*, edited by N.M. de S. Cameron and M. E. Mitchell. Hoboken, NJ: Wiley.](#)

III. STS Comes of Age?

Week 8. October 15. A Unified Theory?

[Callon, Michel. 1984. *Some Elements of a Sociology of Translation: Domestication of the Scallops and the Fishermen of St Brieuc Bay.* *Sociological Review* 32, 196-233.](#)

Latour, Bruno. 1987. *Science in Action: How to Follow Scientists and Engineers through Society*. Cambridge, MA: Harvard University Press.

Amsterdamska, Olga. 1990. ["Surely You are Joking, Monsieur Latour!"](#) *Science, Technology & Human Values* 15(4): 495-504.

Additional Resources:

Latour, Bruno. 2007. *Reassembling the Social: An Introduction to Actor-Network-Theory*. Oxford: Oxford University Press.

Akrich, Madeleine. 1997. "The De-Description of Technical Objects." In *Shaping Technology/Building Society: Studies in Sociotechnical Change*, edited by W. E. Bijker and J. Law, 205-225. Cambridge: MIT Press.

****Mid-term Exam Due: Wednesday, October 21 by 11:59pm****

Week 9. October 22. Mid-Semester Assessment and Collaboration

Group Project Ideation: No formal reading. Come to seminar prepared to discuss group projects. We will provide possible topics; guests from last year's project will join the class to share experiences and answer questions.

Week 10. October 29. Post-Truth?

[Sokal, Alan. 1996.](#) “Transgressing the Boundaries: Toward a Transformative Hermeneutics of Quantum Gravity” *Social Text* 46/47, Vol. 14, Nos. 1 & 2, pp 217–252.

[Shapin, Steven. 2001.](#) “How to be Antiscientific.” In *The One Culture* edited by Jay A. Labinger and Harry Collins, 99-115. The University of Chicago Press.

[Latour, Bruno. 2004.](#) “Why Has Critique Run out of Steam? From Matters of Fact to Matters of Concern.” *Critical Inquiry* 30, no. 2: 225-248.

[Fuller, Steve. 2018.](#) *Post-Truth: Knowledge as a Power Game*. London: Anthem, selections.

Additional Resources:

Hoffman, Steve G. 2018. “The Responsibilities and Obligations of STS in a Moment of Post-Truth Demagoguery.” *Engaging Science, Technology, and Society* 4: 453-457.

IV. Situated Knowledges and Engaged Practices

Week 11. November 5. Objectivity/Subjectivity

[Daston, Lorraine and Peter Galison. 2007.](#) *Objectivity*. Cambridge, MA: MIT Press. Preface, Prologue, Chapter 1, notes.

[Haraway, Donna. 1991.](#) “Situated Knowledges: The Science Question in Feminism and the Privilege of Partial Perspective.” In *Simians, Cyborgs and Women: The Reinvention of Nature*, 183-201. New York: Routledge.

[Harding, Sandra. 1986.](#) *The Science Question in Feminism*. Ithaca, NY: Cornell University Press, selections.

[Rajagopalan, Ramya M., Alondra Nelson, and Joan H. Fujimura. 2017.](#) “Race and Science in the Twenty-First Century” In *The Handbook of Science and Technology Studies* (4th ed.), edited by Ulrike Felt, Rayvon Fouché, Clark A. Miller, and Laurel Smith-Doerr, 349-378. Cambridge: MIT Press.

Week 12. November 12. The Global Turn

[Anderson, Benedict. 1996 \(7th ed.\).](#) *Imagined Communities: Reflections on the Origin and Spread of Nationalism*. London & New York: Verso, selections.

[Anderson, Warwick. 2002. "Introduction: Postcolonial Technoscience." *Social Studies of Science* 32, no. 5/6: 643-658.](#)

[Elshakry, Marwa. 2010. "When Science Became Western: Historiographical Reflections." *Isis* 101: 98-109.](#)

[Beck, Silke, Tim Forsyth, Pia M. Kohler, Myanna Lahsen, and Martin Mahony. 2017. "The Making of Global Environmental Science and Politics." In *The Handbook of Science and Technology Studies* \(4th ed.\), edited by Ulrike Felt, Rayvon Fouché, Clark A. Miller, and Laurel Smith-Doerr, 1059-1086. Cambridge: MIT Press.](#)

Week 13. November 19. Infrastructures and Imaginaries

[Star, Susan Leigh. 1999. "The Ethnography of Infrastructure." *American Behavioral Scientist* 43 \(3\): 377-391.](#)

[Jasanoff, Sheila \(ed.\) 2004. *States of Knowledge: The Co-Production of Science and Social Order*. London & New York: Routledge, selections.](#)

[Jasanoff, Sheila, and Sang-Hyun Kim \(eds\). 2015. *Dreamscapes of Modernity: Sociotechnical Imaginaries and the Fabrication of Power*. Chicago: University of Chicago Press, chapter 1.](#)

Additional Resources:

[Porter, Theodore. 1992. "Quantification and the Accounting Ideal in Science." *Social Studies of Science* 22: 633-652.](#)

November 26: Virginia Tech Thanksgiving Recess -- no class.

V. Conclusion

Week 14. December 3. Persistent Strands and New Directions

****Group Project Presentation and Critique Session****

[Law, John. 2017. "STS as Method" In *The Handbook of Science and Technology Studies* \(4th ed.\), edited by Ulrike Felt, Rayvon Fouché, Clark A. Miller, and Laurel Smith-Doerr, 31-57. Cambridge: MIT Press.](#)

Group readings: Each group will assign one core text.

*****Group Project due December 15 by 11:59 pm*****

******Version August 2020 – we reserve the right to modify this syllabus. MAKE SURE YOU ALWAYS CHECK THE LATEST ONLINE VERSION!******