

SOCI 325: Sociology of Science

Location Arts Building, room 150 and online through [Microsoft Teams](#)

Time Fall 2023, Tuesday and Thursday 2:35-3:55pm

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Office hours TBA

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Syllabus <https://soci325.netlify.app>

Description

STS (an acronym for either “science and technology studies” or “science, technology, and society,” depending on who is asked) is a diverse field spanning research across the social sciences, humanities, and physical sciences. This course aims to give students a window into STS, adopting a specifically *sociological* viewpoint. The discipline of sociology has a distinctive perspective on the nature of knowledge and scientific institutions, and the course content will explore theories and applications of this perspective.

The course is structured as a hybrid of lectures and seminars. Most of the classes will begin with a short presentation by the instructor, but the bulk of the class time will be spent in small-group discussions. Group work will consist of structured discussions of the course readings in the context of broad themes and theories introduced throughout the semester. The success of the course therefore relies on students’ engaged readings of the assigned texts.

Expectations

Students are expected to (1) closely read the assigned texts, (2) participate in group discussions and worksheets, (3) submit three discussion questions, (4) complete peer evaluations, and (5) complete a final poster presentation. Each of these expectations is detailed below.

Reading

The assigned readings are the core of the course material, and students are expected to carefully and critically read each assignment *before* class. To facilitate students’ engagement with the reading and to help prevent students from falling behind, we will use the online tool *Perusall* for all required readings. *Perusall* is a reading platform in which students annotate texts collaboratively alongside one another. [More information on how Perusall works and how it is integrated into the course is available here.](#)

Readings will be graded as either complete (1 point) or incomplete (0 points). Student responses must demonstrate a thoughtful and thorough reading of the entire assignment to receive credit. At the end of the semester, the *four* lowest reading grades will be dropped from the assessment. Reading assessments will contribute 10% to the final grade for the course.

Lectures

Typically, the first 15–30 minutes of the class will consist of a live-streamed lecture during which students (including any attending remotely) are encouraged to engage in class-wide discussion.

The slides will be made available before class, and a recording of the lecture (with an auto-generated transcript) will be available later the same day.

Group discussions

The large portion of class time will be devoted to small-group discussions and collaborative composition of discussion responses. After the second full week of classes, students will form groups of approximately four or five. Groups will work together to provide responses to provided

worksheets of discussion questions. There will be a total of 9 worksheets over the course of the semester, each spanning the content from multiple class periods. Exact due dates are available on the [schedule] below.

The worksheets will be evaluated according to the following rubric:

10 points : Responses demonstrate a nuanced engagement with the reading and link ideas from the text to themes, theories, and other topics from class.

8–9.5 points : Responses demonstrate a basic engagement with the reading but may miss important implications or connections.

5–7.5 points : Responses demonstrate a superficial understanding/engagement of the reading or contain numerous fundamental misunderstandings of the concepts.

0–4.5 points : Responses are cursory, or not submitted at all.

Marks for worksheet responses will be given to all members of the group. At the end of the semester, groups will perform peer evaluation (submitting evaluations is worth 2.5% of your total grade) that will adjust each participant's discussion grade up or down by as much as 10%. Group discussions will contribute 30% to the final grade for the course**.

Discussion prompts

Each student is responsible for submitting *three* discussion prompts relating to the readings over the semester. By the end of the second full week of class, random assignments will be sent to each student. *If your assigned reading creates a conflict for you, please contact the professor as soon as possible to resolve the scheduling.*

Discussion prompts will be evaluated on a ten-point scale based on the engagement and originality of the question. High-scoring submissions will engage with more than just basic concepts and will elicit responses that go beyond what is written in the text itself. For instance, the prompt might ask for a critical engagement with a point made by the author, suggesting a different interpretation of the reading; or the prompt might contrast a point made in the text to another reading or topic discussed in the class. Students should try to craft questions that will help others to think *outside* the reading.

Throughout the semester, the instructor will choose some submitted questions to be included on the discussion worksheets described above. Students whose questions are used in this way will receive an automatic mark of 10/10 (100%) on their submission. Discussion questions will contribute 20% to the final grade for the course.

Poster presentation

At the end of the semester, students will participate in a peer-evaluated virtual poster session. Each student will produce a digital poster presenting a piece of scientific research or technological output to an outside perspective. Further details will be provided in class.

In total, the final project will be worth 37.5% of each student's grade, broken down as follows: 5% for topic submission and group peer review (due Tue, Oct 3); 30% for the poster (due Tue, Dec 5); and 2.5% for peer evaluation of others' posters (due Fri, Dec 8).

Evaluation

Reading	See schedule for dates	10% of final grade
Group discussions	See schedule for dates	30% of final grade
Discussion group peer evaluation	Fri, Dec 9	2.5% of final grade

Discussion prompts	<i>variable</i>	20% of final grade
Poster topic submission	Tue, Oct 3	5% of final grade
Poster	Tue, Dec 5	30% of final grade
Poster peer evaluation	Fri, Dec 8	2.5% of final grade

Accessibility

Students who need accommodation or who are having trouble accessing any aspect of the course may contact me directly. I will make every effort to accommodate individual situations, including religious, medical, or other personal circumstances.

Students with disabilities or otherwise in need of formal accommodation are encouraged to contact the Office for Student Accessibility & Achievement (formerly Office for Students with Disabilities: <https://www.mcgill.ca/access-achieve/>, phone 514-398-6009).

Les étudiants qui ont besoin d'un accommodation ou qui ont des difficultés à accéder à un aspect du cours peuvent me contacter directement. Je ferai tout mon possible pour tenir compte des circonstances individuelles, y compris des circonstances religieuses, médicales ou autres.

Les étudiants handicapés ou ayant besoin d'un aménagement formel sont encouragés à contacter le Service étudiant d'accessibilité et d'aide à la réussite (<https://www.mcgill.ca/access-achieve/fr>, téléphone 514-398-6009).

Academic integrity

McGill University values academic integrity. Therefore, all students must understand the meaning and consequences of cheating, plagiarism and other academic offences under the Code of Student Conduct and Disciplinary Procedures (see <http://www.mcgill.ca/students/srr/honest/> for more information). (approved by Senate on 29 January 2003)

L'université McGill attache une haute importance à l'honnêteté académique. Il incombe par conséquent à tous les étudiants de comprendre ce que l'on entend par tricherie, plagiat et autres infractions académiques, ainsi que les conséquences que peuvent avoir de telles actions, selon le Code de conduite de l'étudiant et des procédures disciplinaires (pour de plus amples renseignements, veuillez consulter le site <http://www.mcgill.ca/students/srr/honest/>).

Generative AI

Students may use artificial intelligence tools for creating an outline for an assignment, but the final submitted assignment must be original work produced by the individual student or group alone.

Language of evaluation

In accord with McGill University's Charter of Students' Rights, students in this course have the right to submit in English or in French any written work that is to be graded. (approved by Senate on 21 January 2009)

Conformément à la Charte des droits de l'étudiant de l'Université McGill, chaque étudiant a le droit de soumettre en français ou en anglais tout travail écrit devant être noté (sauf dans le cas des cours dont l'un des objets est la maîtrise d'une langue).

Grade appeals

Instructors and teaching assistants take the marking of assignments very seriously, and we work diligently to be fair, consistent, and accurate. Nonetheless, mistakes and oversights occasionally happen. If you believe that to be the case, you must adhere to the following rules:

⋮ If it is a mathematical error simply alert the instructor of the error.

⋮ In the case of more substantive appeals, you must:

1. Wait at least 24 hours after receiving your mark.

2. Carefully re-read your assignment, all guidelines and marking schemes, and the grader's comments.
3. If you wish to appeal, you must submit to the instructor a written explanation of why you think your mark should be altered. Please note that upon re-grade your mark may go down, stay the same, or go up.

Schedule



Introduction and themes

The course will open with an introduction some of the unifying themes of the sociology of science. Readings will introduce some of the ways that both the doing of science (research and institutions) and the outcomes of science (findings and knowledge) are steeped in social processes. We will learn about the historical context of science as an institution, and see the way that this institution aligns with societal structures of power.

Thu, Aug 31

Lectures:

- ⋮ Course overview and introduction
- ⋮ ([html](#); [pdf](#))

Discussion: (*No group work*)

Required:

- ⋮ Hird (2011), *Science, Technology, and the Sociological Imagination* (due Sep 6)

Tue, Sep 5

Lectures:

- ⋮ **Theme**—Scientific outcomes are social
- ⋮ ([html](#); [pdf](#); [vid](#))

Discussion: (*In-class*)

Required:

- ⋮ Benjamin (2019), *Engineered Inequity: Are Robots Racist?*

Thu, Sep 7

Lectures:

- ⋮ **Theme**—Scientific practice is social
- ⋮ ([html](#); [pdf](#); [vid](#))

Discussion: (*In-class*)

Required:

- ⋮ Goodyear (2016), *The Stem-Cell Scandal*

Tue, Sep 12

Lectures:

- ⋮ **Theme**—Science aligns with power
- ⋮ ([html](#); [pdf](#))

Discussion: (*In-class*)

Required:

- ⋮ Gould (1981), *Measuring Heads*

Supplementary:

- ⋮ “The Body Mass Index” (2021), Maintenance Phase (podcast) *The Body Mass Index*
- ⋮ Daston and Galison (2010), *Epistemologies of the Eye*

Thu, Sep 14

Lectures:

- ⋮ **Theme**—History of science is a social history

Discussion: (*In-class*)

Required:

- ⋮ Wolfe (2018), *Freedom's Laboratory (Introduction)*

Science as an institution

functionalists like Merton examined the norms and culture of science to understand what made 'good science' work. The study of science was turned on its head in the 1960s and 1970s by research (like that of Kuhn) that took scientific knowledge itself to be an institutional outcome. Understanding the institutional features of science can illuminate certain structural barriers to participation in science by marginalized groups.

Tue, Sep 19

Lectures:

- ⋮ Scientific norms through a functionalist lens

Discussion: Discussion worksheet 1 (due Fri, Sep 22)

Required:

- ⋮ Merton (1973), *The normative structure of science*

Tue, Sep 26

Lectures:

- ⋮ Normal science, paradigms, and scientific revolutions

Discussion: Discussion worksheet 2 (due Fri, Sep 29)

Required:

- ⋮ Kuhn (1970), *Anomaly and the Emergence of Scientific Discoveries* and *Crisis and the Emergence of Scientific Theories*

Thu, Sep 21

No class (instructor absence)

Thu, Sep 28

Lectures:

- ⋮ Structural barriers to participation in science

Discussion: Discussion worksheet 2 (due Fri, Sep 29)

Required:

- ⋮ van den Brink and Benschop (2012), *Gender practices in the construction of academic excellence: Sheep with five legs*

Is knowledge social?

The social processes underlying scientific theories and discoveries call into question the nature of scientific knowledge itself. What does it mean when STS scholars say that knowledge is socially constructed? Is there such a thing as objectivity, or are scientific observations only meaningful in a particular social context?

Tue, Oct 3

Lectures:

- ⋮ Social construction and the real

Discussion: (No group work)

Required:

- ⋮ Sismondo (2009), *Chapter 6: The social construction of scientific and technical realities*

Supplementary:

- ⋮ Goward (2008), *Twelve readings on the lichen thallus: I. Face in the Mirror*

Thu, Oct 5

Lectures:

- ⋮ The 'strong programme' and scientific anti-realism

Discussion: Discussion worksheet 3 (due Fri, Oct 13)

Required:

- ⋮ Bloor ([1974] 1991), *The strong programme in the sociology of knowledge*

Tue, Oct 10

No class (McGill Fall reading break)

Thu, Oct 12

Lectures:

- ∴ Feminist epistemologies

Discussion: Discussion worksheet 3 (due Fri, Oct 13)

Required:

- ∴ Haraway (1988), *Situated Knowledges: The Science Question in Feminism and the Privilege of Partial Perspective*
- ∴ Martin (1991), *The Egg and the Sperm: How Science Has Constructed a Romance Based on Stereotypical Male-Female Roles*

Tue, Oct 17

Lectures:

- ∴ Scientific realism

Discussion: Discussion worksheet 4 (due Fri, Oct 20)

Required:

- ∴ Hacking (1983), *What is scientific realism?* and *Building and Causing*

Studying laboratories

Sociologists of science have a particular interest in laboratories as sites for ethnographic research. Observing scientists discussing theories, making sense of observations, and presenting findings allows a unique perspective on the social processes at play.

Thu, Oct 19

Lectures:

- ∴ Tacit knowledge and experimental reproduction

Discussion: Discussion worksheet 4 (due Fri, Oct 20)

Required:

- ∴ Collins (1975), *The Seven Sexes: A Study in the Sociology of a Phenomenon, or the Replication of Experiments in Physics*

Tue, Oct 24

Lectures:

- ⋮ Representing reality

Discussion: Discussion worksheet 5 (due Fri, Oct 27)

Required:

- ⋮ Amann and Knorr Cetina (1988), *The Fixation of (Visual) Evidence*

Thu, Oct 26

Lectures:

- ⋮ Participants beyond the laboratory
- ⋮ —actor–network theory (ANT)

Discussion: Discussion worksheet 5 (due Fri, Oct 27)

Required:

- ⋮ Sismondo (2009), *Chapter 8: Actor–network theory*
- ⋮ Callon (1984), *Some Elements of a Sociology of Translation: Domestication of the Scallops and the Fishermen of St Brieuc Bay*

Tue, Oct 31

Lectures:

- ⋮ *Poster session brainstorm and peer assessment*

Science as power

Like any institution (especially one as well funded and generally well regarded as science), the practices and ideologies of science frequently align with existing structures of power in society. Whether one considers technologies of war, classifications of race, or justifications for political action, the history of Western science is inextricably linked with the history of European colonialism.

Thu, Nov 2

Lectures:

- ⋮ Political economy of science and technology

Discussion: (*No group work*)

Required:

- ⋮ Sismondo (2009), *Chapter 17: Political Economies of Knowledge*

Tue, Nov 7

Lectures:

- ⋮ Science, colonialism, and postcolonial science studies

Discussion: Discussion worksheet 6 (due Fri, Nov 10)

Required:

- ⋮ Adams (2002), *Randomized Controlled Crime*

Supplementary:

- ⋮ Whitt (1998), *Bicolonialism and the commodification of knowledge*

Thu, Nov 9

Lectures:

- ⋮ Science, race, and health

Discussion: Discussion worksheet 6 (due Fri, Nov 10)

Required:

- ⋮ Poudrier (2007), *The Geneticization of Aboriginal Diabetes and Obesity*

Tue, Nov 14

Lectures:

- ∴ Standardization, bodies, and society

Discussion: Discussion worksheet 7 (due Fri, Nov 17)

Required:

- ∴ Herzig (1999), *Removing Roots: "North American Hiroshima Maidens" and the X Ray*

Supplementary:

- ∴ Woods and Watson (2004), *In Pursuit of Standardization: The British Ministry of Health's Model 8F Wheelchair, 1948-1962*

Scientists and the public

The authority that scientific communication enjoys in public discourse can lead to conflict between scientists and non-scientists. Public debates take a particularly salient turn when scientific findings are at odds with popular beliefs. Moreover, the authoritative voice of scientific communication can be coopted by non-scientists to make more persuasive points.

Thu, Nov 16

Lectures:

- ∴ Public trust, participation, and implicit values

Discussion: (No group work)

Required:

- ∴ Winner (1980), *Do artifacts have politics?*

Tue, Nov 21

Lectures:

- ∴ Science and identity

Discussion: Discussion worksheet 8 (due Fri, Nov 24)

Required:

- ∴ TallBear (2013), *Genomic articulations of indigeneity*

Thu, Nov 23

Lectures:

- ∴ AI, knowledge, and social data

Discussion: Discussion worksheet 8 (due Fri, Nov 24)

Required:

- ∴ Joyce et al. (2021), *Toward a Sociology of Artificial Intelligence*

Supplementary:

- ∴ Roberts (2020), *Your AI Is a Human*

Tue, Nov 28

Lectures:

- ∴ Local knowledge

Discussion: Discussion worksheet 9 (due Tue, Dec 5)

Required:

- ∴ Allen (2018), *Strongly Participatory Science and Knowledge Justice in an Environmentally Contested Region*

Thu, Nov 30

No class (Monday course schedule)

Tue, Dec 5

Lectures:

- ∴ Science denial

Discussion: Discussion worksheet 9 (due Tue, Dec 5)

Required:

- ∴ Harambam and Aupers (2015), *Contesting epistemic authority: Conspiracy theories on the boundaries of science*

Supplementary:

- ∴ de Vrieze (2017), *Bruno Latour, a veteran of the "science wars," has a new mission*

References

- Adams, Vincanne. 2002. "Randomized Controlled Crime: Postcolonial Sciences in Alternative Medicine Research." *Social Studies of Science* 32 (5-6): 659–90. <https://doi.org/10.1177/030631270203200503>.
- Allen, Barbara L. 2018. "Strongly Participatory Science and Knowledge Justice in an Environmentally Contested Region." *Science, Technology, & Human Values* 43 (6): 947–71. <https://doi.org/10.1177/0162243918758380>.
- Amann, Klaus, and Karin Knorr Cetina. 1988. "The Fixation of (Visual) Evidence." *Human Studies* 11 (2/3): 133–69. www.jstor.org/stable/20009024.
- Benjamin, Ruha. 2019. *Race After Technology: Abolitionist Tools for the New Jim Code*. 1 edition. Medford, MA: Polity.
- Bloor, David. (1974) 1991. *Knowledge and social imagery*. 2nd ed. Chicago: University of Chicago Press.
- Brink, Marieke van den, and Yvonne Benschop. 2012. "Gender Practices in the Construction of Academic Excellence: Sheep with Five Legs." *Organization* 19 (4): 507–24. <https://doi.org/10.1177/1350508411414293>.
- Callon, Michel. 1984. "Some Elements of a Sociology of Translation: Domestication of the Scallops and the Fishermen of St Brieuc Bay." *The Sociological Review* 32 (1_suppl): 196–233. <https://doi.org/10.1111/j.1467-954X.1984.tb00113.x>.
- Collins, H. M. 1975. "The Seven Sexes: A Study in the Sociology of a Phenomenon, or the Replication of Experiments in Physics." *Sociology* 9 (2): 205–24. <https://doi.org/10.1177/003803857500900202>.
- Daston, Lorraine, and Peter Galison. 2010. *Objectivity*. 1st paperback ed. New York: Zone Books.
- Goodyear, Dana. 2016. "The Stem-Cell Scandal." *The New Yorker*, February 22, 2016. <https://www.newyorker.com/magazine/2016/02/29/the-stem-cell-scandal>.
- Gould, Stephen Jay. 1981. *The Mismeasure of Man*. New York : Norton,.
- Goward, Trevor. 2008. "Twelve Readings on the Lichen I The Face in the Mirror." *Evansia* 25 (2): 23–25. <https://doi.org/10.1639/0747-9859-25.2.24>.
- Hacking, I. 1983. *Representing and Intervening: Introductory Topics in the Philosophy of Natural Science*. Cambridge Univ Pr.
- Harambam, Jaron, and Stef Aupers. 2015. "Contesting Epistemic Authority: Conspiracy Theories on the Boundaries of Science." *Public Understanding of Science* 24 (4): 466–80. <https://doi.org/10.1177/0963662514559891>.
- Haraway, Donna. 1988. "Situated Knowledges: The Science Question in Feminism and the Privilege of Partial Perspective." *Feminist Studies* 14 (3): 575–99. <https://doi.org/10.2307/3178066>.
- Herzig, Rebecca. 1999. "Removing Roots: 'North American Hiroshima Maidens' and the X Ray." *Technology and Culture* 40 (4): 723–45. <https://www.jstor.org/stable/25147409>.
- Hird, Myra J. 2011. *Sociology of Science: A Critical Canadian Introduction*. Oxford, New York:

- Oxford University Press.
- Joyce, Kelly, Laurel Smith-Doerr, Sharla Alegria, Susan Bell, Taylor Cruz, Steve G. Hoffman, Safiya Umoja Noble, and Benjamin Shestakofsky. 2021. "Toward a Sociology of Artificial Intelligence: A Call for Research on Inequalities and Structural Change." *Socius* 7 (January): 2378023121999581. <https://doi.org/10.1177/2378023121999581>.
- Kuhn, Thomas S. 1970. *The Structure of Scientific Revolutions*. Chicago : University of Chicago Press,.
- Martin, Emily. 1991. "The Egg and the Sperm: How Science Has Constructed a Romance Based on Stereotypical Male-Female Roles." *Signs: Journal of Women in Culture and Society* 16 (3): 485–501. <https://doi.org/10.1086/494680>.
- Merton, Robert King. 1973. *The sociology of science: theoretical and empirical investigations*. Chicago: University of Chicago Press.
- Poudrier, Jennifer. 2007. "The Geneticization of Aboriginal Diabetes and Obesity: Adding Another Scene to the Story of the Thrifty Gene*." *Canadian Review of Sociology/Revue Canadienne de Sociologie* 44 (2): 237–61. <https://doi.org/10.1111/j.1755-618X.2007.tb01136.x>.
- Roberts, Sarah T. 2020. "Your AI Is a Human." In *Your computer is on fire*, edited by Thomas S Mullaney, Benjamin Peters, Mar Hicks, and Kavita Philip. Cambridge, Massachusetts: The MIT Press. <http://mitpress.mit.edu/9780262539739>.
- Sismondo, Sergio. 2009. *An Introduction to Science and Technology Studies*. Wiley.
- TallBear, Kim. 2013. "Genomic Articulations of Indigeneity." *Social Studies of Science* 43 (4): 509–33. <https://doi.org/10.1177/0306312713483893>.
- "The Body Mass Index." 2021. Maintenance Phase. <https://www.stitcher.com/show/maintenance-phase/episode/the-body-mass-index-85851222>.
- Vrieze, Jop de. 2017. "Bruno Latour, a Veteran of the 'Science Wars,' Has a New Mission." *Science*, October 10, 2017. <http://www.science.org/content/article/bruno-latour-veteran-science-wars-has-new-mission>.
- Whitt, Laurie Anne. 1998. "Biocolonialism and the Commodification of Knowledge." *Science as Culture* 7 (1): 33–67. <https://doi.org/10.1080/09505439809526490>.
- Winner, Langdon. 1980. "Do Artifacts Have Politics?" *Daedalus* 109 (1): 121–36. www.jstor.org/stable/20024652.
- Wolfe, Audra J. 2018. *Freedom's laboratory: the Cold War struggle for the soul of science*. 1 online resource (x, 302 pages) vols. Baltimore: Johns Hopkins University Press. <http://www.overdrive.com/search?q=2802B54A-1CD2-4DA5-BBBB-ED0B2CEF04CA>.
- Woods, Brian, and Nick Watson. 2004. "In Pursuit of Standardization: The British Ministry of Health's Model 8F Wheelchair, 1948-1962." *Technology and Culture* 45 (3): 540–68. <https://www.jstor.org/stable/40060636>.