

Scientific & Technological Controversies

(BASC 201)

Microbes, past & present

Code & coders

Department of Art History and Communication Studies, McGill University

Professor Gabriella Coleman — gabriella.coleman@mcgill.ca

Tuesday & Thursday—2:35 PM—3:25 PM

Office Hours = West Arts 285 by appointment and Wednesday between 1-2:30 PM

Fall 2016

Overview

This course introduces students to a range of issues concerning hacking, openness, and anonymity in science and technology through the angle of controversies. The class takes a broad view of the meanings of hacking, openness, and anonymity and includes, among other topics: the rise of the ethic of openness in science, debates over access and intellectual property law, body modification and disability, the role of new technologies in expanding the scope of state surveillance as well as opening up new possibilities for exposing state secrecy.

Readings

Most readings are available via links on this syllabus or on our course website.

David Greene, the librarian for Communication Studies, is available for support and research assistance. He can be reached at david.greene@mcgill.ca.

The following books are required and available for purchase at Paragraph Books (2220 Av McGill College):

Stuart Firestein, *Ignorance*. Oxford University Press, 2012. (also available as an e-book).

Requirements, Method of Evaluation, and Assignments

- | | |
|-------------------------|---|
| 1. Midterm exam + Essay | 30% (multiple choice and one take-home essay. Each one is worth 15% percent.) |
| 2. Exam | 20% (multiple choice) |
| 3. Eight pop quizzes | 25% (the lowest of the eight will be dropped) |
| 4. Policy Brief | 25% (separate instructions provided) |

Attendance at lectures is mandatory. If you have to miss the lecture, please arrange to get notes and any videos shown in class from a classmate. All cellphones, electronic devices, and wireless connections *must be turned off for the duration of class*. **After our first midterm, computers will be banned and you will have the option of writing an extra credit essay comparing class before and after the ban. If you have a disability that requires you to use a computer or other device, please talk to me after class and we will arrange something.** The extra-credit essay will be due the

last day of class and you will get 1–3 points added to your final policy brief. If you do not use a laptop, you can reflect on why you made that decision in light of what it was like to work in class before and after the ban.

To ensure students keep up with the readings, we will have eight pop quizzes during the course of the semester. They will be short, ten-minute exams covering basic concepts and facts from the reading and from the last lecture or assigned movies. The lowest of the eight will be dropped. They will also be given at different times during the course, sometimes at the start, sometimes in the middle, sometimes at the end, and sometimes during the conference section. There will be two to three freebie quizzes where you won't be tested on the readings but I will use the opportunity to ask students about something like their media habits. You will get 100% for answering the question.

The quizzes will be a proxy for attendance; if you miss too many classes, you will miss quizzes and this will impact your final grade negatively. **However, we will also be taking attendance at the conference sections whether or not there is a quiz.** You can miss up to 3 conference sections with no penalty (except if there is a quiz as we won't be giving make up quizzes unless you were ill and/or had an emergency and have documented proof for the illness or emergency). **Once you have missed more than 3 conference sections, 3 points will be subtracted from your final policy paper grade for each conference section missed.** To be clear: if you miss a conference section four times, we will knock off three points from your final grade. If you miss five conference sections, we will knock off six points from your final grade and so on.

Grading

Grade Breakdown

Grade	Grade point	Percentages
A	4.0	85 – 100
A-	3.7	80 – 84
B +	3.3	75 – 79
B	3.0	70 – 74
B-	2.7	65 – 69
C +	2.3	60 – 64
C	2.0	55 – 59
D	1.0	50 – 54
F (Fail)	0	0 – 49

Grade Appeals

I am always happy to meet to discuss in further detail the criteria used for grading. Please come see me in office hours or make an appointment, if you would like to meet with me to clarify my standards and procedures. It is rare for me to change grades unless it was based on an error of calculation, which has happened on occasion. Academics place serious weight on the process of peer review, which is based on the ideas that qualified outsiders are the best judge of the quality and strength of work. If you would like to discuss or appeal your grade, please follow the process detailed below.

1. I will correct calculation errors, at any time with apologies.
2. Please set up an appointment or come to my office hours to seek explanation for a grade.

The most likely course of action will be to discuss improvement for subsequent assignments.

3. If a student wishes to dispute a grade, you may choose to follow the university's standard appeals process (note: if an appeal is heard at the university level, it is considered *sui generis*, meaning that the grade could stay the same, be raised or lowered and will be graded by another professor in the University).

Email Policy

During the academic year, I receive a considerable amount of email. In order for me to respond to my e-mail efficiently, please follow the following guidelines:

1. Read this helpful guide for emailing your professor: How to email your professor (without being annoying): <https://medium.com/@lportwoodstacer/how-to-email-your-professor-without-being-annoying-af-cf64ae0e4087>
2. If you cannot see me during my office hours, e-mail me to set up an appointment; I will try to respond as soon as possible but I usually cannot accommodate a meeting in 24 or even 48 hours.
3. I read and reply to e-mail once a day and usually do not read or reply to e-mail after 5 PM or weekends.
4. Grade inquiries and disputes will not be considered or discussed via e-mail. For all grade inquiries and questions about assignments, please set up an appointment with me (see above).
5. I will not reply to e-mail inquiries regarding course matters (assignment requirements, due dates, exam structure, readings, etc.) that arise from missing class or inattention to the course syllabus. Inquiries requesting clarification will receive replies, though I would strongly prefer these inquiries to be made in class or during office hours.

Other Information and McGill Policies

Language: 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.

Accommodations: Students requiring special testing accommodations or other classroom modifications should notify Prof. Coleman and the Office for Students with Disabilities as soon as possible. The OSD is located in Suite 3100, Brown Student Services Building, ph: 398-6009 (voice), 398-8198 (TDD), www.mcgill.ca/osd/.

Academic Integrity: McGill University values academic integrity. Therefore, all students must understand the meaning and consequences of cheating, plagiarism, and other academic offenses under the Code of Student Conduct and Disciplinary Procedures. (for more information, see www.mcgill.ca/students/srr/honest/.) 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 www.mcgill.ca/students/srr/honest/).

Academic resources: Students looking for additional assistance with academic reading, study, research and writing skills should consult the McGill academic resources website at: www.mcgill.ca/students/academicresources/.

Counseling: McGill's Counseling Service provides extensive personal, academic, and career counseling to undergraduate and graduate students, including workshops on study skills, multiple-choice exams, text anxiety/stress management. They are located in Brown Student Services Bldg. 398-3601 www.mcgill.ca/counselling/. A list of groups and workshops can be found at: www.mcgill.ca/counselling/groups/

Illness: Students are responsible for material covered in all classes, including anything missed due to illness. Examinations will not be rescheduled and assignment due date extensions will not be provided, for any reason other than documented illness and some family emergencies. Students unable to attend examinations or complete assignments due to illness are expected to contact me prior to the examination or due date by email and by phone. Appropriate documentation will be required to support requests for special consideration due to illness (see <http://www.mcgill.ca/students/advising/faq#a14>).

Schedule

The following is a "working schedule." *Class materials are subject to change* based on the interests, understanding, and general pace of the class. It is your responsibility to keep on top of any schedule changes, whether you are in class or not. If you have a concern about any of the materials, please speak to me or the teaching assistants.

Week 1

September 6: Introductions

Henry Petroski, "Numeracy and Literacy: The Two Cultures and the Computer Revolution." The Virginia Quarterly Review, Spring 1985. <http://www.vqronline.org/essay/numeracy-and-literacy-two-cultures-and-computer-revolution>

Lorretta Jackson Heyes, "We don't need more STEM majors. We need more STEM majors with liberal arts training." Washington Post, 2015.

<https://www.washingtonpost.com/posteverything/wp/2015/02/18/we-dont-need-more-stem-majors-we-need-more-stem-majors-with-liberal-arts-training/>

Cindy May, "A Learning Secret: Don't Take Notes with a Laptop." Scientific American, June 3, 2014. <http://www.scientificamerican.com/article/a-learning-secret-don-t-take-notes-with-a-laptop/>

September 8: The Disorder and Ignorance of Science

Stuart Firestein, "Ignorance: How It Drives Science." 2015. (Introduction, Chapter 1, 2)

John Dupre, "The Disorder of Things: Metaphysical Foundations of the Disunity of Science." Proceedings and Addresses of the American Philosophical Association, 1995.

* No Conference Section

Week 2

September 13: Ignorance continued

Stuart Firestein, "How Ignorance Drives Science." 2015 (Chapters 5, 7)

Abraham Flexner, "The Usefulness of Useless Knowledge." Harper's Magazine, 1962.

<https://library.ias.edu/files/UsefulnessHarpers.pdf>

Bryan Nelson, "Humpback whales around the globe are mysteriously rescuing animals from orcas."

Mother Nature Network, July 30, 2016. <http://www.mnn.com/earth-matters/animals/stories/humpback-whales-around-globe-are-mysteriously-rescuing-animals-orcas>

September 15: The Limits of Enlightenment Rationality and the Question of Truth

Friedrich Nietzsche, "On Truth and Lies." Unpublished manuscript, 1873.

[http://oregonstate.edu/instruct/phl201/modules/Philosophers/Nietzsche/Truth and Lie in an Extra-Moral Sense.htm](http://oregonstate.edu/instruct/phl201/modules/Philosophers/Nietzsche/Truth_and_Lie_in_an_Extra-Moral_Sense.htm)

Horst W. J. Rittell & Melvin M. Webber, "Dilemmas in a General Theory of Planning." Policy Sciences, 1973.

Conference Sections: Rationality and the Desire for Perfection, Gone Amok

Michael Sandel, "The Case Against Perfection." The Atlantic, 2014.

<http://www.theatlantic.com/magazine/archive/2004/04/the-case-against-perfection/302927/>

Before class, watch:

Glynis Whiting. "The sterilization of Leilani Muir." 1996.

<https://www.mcgill.ca/library/services/teaching/class-screening/media>

http://mcgill.worldcat.org/title/nfbca/oclc/429506139&referer=brief_results (You can watch this movie from the McGill Library website for free. Once you are on the National Film Board of Canada website, which you must access from one of the two links provided, do a search for the movie title and it will show up).

Week 3

September 20: The Politics of Language and Truth/Reality

John Colapinto, "The Interpreter: Has a remote Amazonian tribe upended our understanding of language?" The New Yorker, 2007 <http://www.newyorker.com/magazine/2007/04/16/the-interpreter-2>

Susan Sontag, "Illness as Metaphor." 1978. (excerpts)

September 22: Values in Science and Technology

Helen Nissenbaum, "Values in Technical Design." Encyclopedia of Science, Technology and Ethics, 2005. <http://www.nyu.edu/projects/nissenbaum/papers/valuesintechnicaldesign.pdf>

Heather Douglass, "Rejecting the Ideal of Value-Free Science". Value-Free Science? Ideals and Illusions, 2007. <http://joelvelasco.net/teaching/3330/douglas-rejectingvaluefreeideal.pdf>

Conference Sections: Class discussion

Debate and discuss this week's readings, especially Colapinto and Douglass.

MICROBES, PAST AND PRESENT

Week 4

September 27: Establishing Truth (is Not so Easy)

Nancy Tomes, "The Gospel Emergent." *The Gospel of Germs*, 1998.

Science Satire Serpent, "Heroes of Science-Barry J. Marshall." 2012.

<http://sciencedevil.wordpress.com/2012/12/21/hero-of-science-barry-j-marshall/>

September 29: In-Class Film

Michael Graziano, "Resistance." 2015.

Conference Sections: Antibiotic Resistance

Nancy Tomes, "The Gospel in Retreat: The Waning of Enthusiasm." *The Gospel of Germs*, 1998.

Hannah Landecker, "Antibiotic Resistance and the Biology of History." *Body and Society*, 2015.

Week 5

October 4: A New Paradigm Emerges

Thomas Kuhn, "The Structure of Scientific Revolutions." 1962. (Excerpts)

Ed Yong, "I Contain Multitudes: The Microbes Within Us and a Grand View of Life." 2016.
(Chapter 2)

October 6: A New Paradigm Emerges in Some Places.

Alex Nading, "Evidentiary Symbiosis: On Paraethnography in Human—Microbe Relations."
Science as Culture. 2016.

Conference Sections: Rethinking the Brain/Gut/microbe Connection

Peter Andrey Smith, "Can the Bacteria in Your Gut Explain Your Mood?" *The New York Times Magazine*, June 23, 2015. http://www.nytimes.com/2015/06/28/magazine/can-the-bacteria-in-your-gut-explain-your-mood.html?_r=0

Christie Wilcox, "Toxoplasma's Dark Side: The Link Between Parasite and Suicide." *Scientific American*, July 4, 2012. <http://blogs.scientificamerican.com/science-sushi/toxoplasmas-dark-side-the-link-between-parasite-and-suicide/>

Week 6

October 11: Pandemics, Microbes and Secrecy

Carlo Caduff, "Experiments of Concern." *The Pandemic Perhaps: Dramatic Events in a Public Culture of Danger*. 2015.

Michael Specter, "The Trouble with Scientific Secrets." *The New Yorker*, December 22, 2011.
<http://www.newyorker.com/news/news-desk/the-trouble-with-scientific-secrets>

CODE and CODERS/HACKERS

October 13: Hackers

Gabriella Coleman, “Hacker.” Digital Keywords, 2016. <http://culturedigitally.org/wp-content/uploads/2016/07/Coleman-2016-Hacker-Digital-Keywords-Peters-ed.pdf>

Conference Sections: Responding to Pandemics and the Case for Open Source Software

Dr. Suerie Moon et al., “Will Ebola change the game? Ten essential reforms before the next pandemic. The report of the Harvard-LSHTM Independent Panel on the Global Response to Ebola.” The Lancet, November 28, 2015.

Before the conference sections, watch:

Salton Arthur Massally et al., “How Open Source Software, second hand laptops and hackers helped stop Ebola (and stopped an apocalypse).” 2015. <https://media.ccc.de/v/32c3-7561>
[how open source software second hand laptops and hackers helped stop ebola and stopped an apocalypse](#)

Week 7

October 18: What is Intellectual Property Law?

Carla Hesse, “The rise of intellectual property, 700 B.C. —A.D. 2000: an idea in the balance.” Daedalus, 2002.

October 20: In-class exam

Multiple-choice exam // take-home essay due at the end of class.

Conference Sections

No conference sections. Use the time to study or to relax after the exam but you are required to watch “The Internet’s Own Boy” (Brian Knappenberger, 2014). We will be discussing some of this material the following week.

<https://archive.org/details/TheInternetsOwnBoyTheStoryOfAaronSwartz>

Week 8

October 25: What Is Code? What is Free Software

Paul Ford, “What is Code?” Bloomberg Businessweek, June 11, 2015. (read first half)

<http://www.bloomberg.com/graphics/2015-paul-ford-what-is-code/>

Richard Stallman, “What is Free Software?” 2014. [http://www.fsf.org/about/what-is-free-software.](http://www.fsf.org/about/what-is-free-software)

October 29: Freeing Software, Open Science

Paul Ford, “What is Code?” Bloomberg Businessweek, June 11, 2015. (read second half)

<http://www.bloomberg.com/graphics/2015-paul-ford-what-is-code/>

Karl Fogel, “Free” Versus “Open Source.” Producing Open Source Software, 2005.

<http://producingoss.com/en/introduction.html#free-vs-open-source>

Skype Lecture Guest: Titus Brown, Associate Professor of Population Health and Reproduction, at UC Davis, Open Source Software Hacker, and Open Science Proponent. He will be discussing

the use of software in scientific discovery and how to credit programmers who write software that is increasingly indispensable for invention/discovery.

Conference Sections: How Free Should Science and Technology Be?

Alex Blumberg & Laura Sydell, "When Patents Attack." This American Life (podcast transcript), July 22, 2011. <http://www.npr.org/sections/money/2011/07/26/138576167/when-patents-attack>
Noah Smith, "Patent Law Hold Back Science." Bloomberg, March 23, 2016.
<https://www.bloomberg.com/view/articles/2016-03-23/rigid-patent-laws-pose-risk-of-a-new-dark-ages>
Simon Oxenham, "Meet the Robin Hood of Sciences." Big Think, February 16, 2016.
<http://bigthink.com/neurobonkers/a-pirate-bay-for-science>

Week 9

November 1: Algorithms and Accountability in Software

Julia Angwin, "Make Algorithms Accountable." The New York Times, August 1, 2016.
<http://www.nytimes.com/2016/08/01/opinion/make-algorithms-accountable.html>
Tarleton Gillespie, "Algorithm." Digital Keywords, 2016. <http://culturedigitally.org/wp-content/uploads/2016/07/Gillespie-2016-Algorithm-Digital-Keywords-Peters-ed.pdf>

November 3: McGill Neurological Institute and Opening Science

Class visit TBD

Daniel McCabe, "A bold experiment in open science." McGill News, May 24, 2016.
<http://publications.mcgill.ca/mcgillnews/2016/05/24/a-bold-experiment-in-open-science/>

Conference Sections: When Openness is Not Enough

Micah Zenko. "Introduction." Red Teaming, 2015.
Margaret Heffernan, "Dare to Disagree." TED Global 2012.
https://www.ted.com/talks/margaret_heffernan_dare_to_disagree?language=en

Week 10

November 8: Running an Open Source Business

Class lecturer: Thomas Erikson, CEO of open source firm Acquia <https://www.acquia.com/>

November 10: No class

No Conference Sections.

Week 11

November 15: Gender, Diversity, and Computing

Jennifer Light, "When Computers Were Women." Technology and Culture, July 1999.
Robert Sutton, "Why I Wrote the No Asshole Rule." Harvard Business Review, March 17, 2007.
<https://hbr.org/2007/03/why-i-wrote-the-no-asshole-rule>

November 17: Exam Number 2

In-class exam.

Conference Sections: Gender and Computer Science

Selena Simmons-Duffin, "Talking While Female." NPR Shots, October 24, 2014.

<http://www.npr.org/sections/health-shots/2014/10/24/357584372/video-what-women-get-flak-for-when-they-talk>

Colleen Flaherty, "Bias Against Female Instructors." Inside Higher Ed, January 11, 2016.

<https://www.insidehighered.com/news/2016/01/11/new-analysis-offers-more-evidence-against-student-evaluations-teaching>

Shankar Vedantam, "How Stereotypes Can Drive Women to Quit Science." All Things Considered (podcast transcript), July 12, 2012. <http://www.npr.org/2012/07/12/156664337/stereotype-threat-why-women-quit-science-jobs>

Week 12

November 22: Security and Code

Guest Lecturer: Oliver Bilodeau, security researcher, hacker, and co-founder of Montréhack

<http://montrehack.ca>

Micah Zenkto, "Competitors: Private Sector Read Teaming." Red Team, 2015.

CyberSquirrel, "The Threat to America's Electrical Grid is Much Bigger Than You Can Possibly Imagine." Foreign Policy, July 31, 2016. http://foreignpolicy.com/2016/07/31/the-threat-to-americas-electrical-grid-is-much-bigger-than-you-can-possibly-imagine-cyberwar-squirrels-rodents-hackers/?wp_login_redirect=0

November 24: Surveillance and Privacy

Julian Angwin, "State of Surveillance" and "Freedom of Association." Dragnet Nation, 2014.

Moxie Marlinspike, "Why 'I Have Nothing to Hide' Is the Wrong Way to Think About Surveillance." Wired, June 13, 2013. <http://www.wired.com/2013/06/why-i-have-nothing-to-hide-is-the-wrong-way-to-think-about-surveillance/>

Conference Sections: Is there too much Surveillance? Is CyberWar a Real Threat?

Watch "Citizen Four" (Laura Poitras, 2014) before our conference sections

Molly Sauter, "When is a Hack an Act of War?" Motherboard, July 28, 2016.

<http://motherboard.vice.com/read/policy-directive-41-cyber-incidents>

Week 13

November 29: Anonymity in the Age of the Internet

Helen Nissenbaum, "The meaning of anonymity in an information age." The Information Society, 1999. http://www.nyu.edu/projects/nissenbaum/paper_anonymity.html

Gabriella Coleman, "Epilogue." Hacker, Hoaxer, Whistleblower, Spy, 2015.

<http://gabriellacoleman.org/wp-content/uploads/2015/11/hhws-epilogue-extract.pdf>

Nicole Bogart, "Forget anonymity: Internet trolls are more abusive when using their real names, study finds." Global News, July 27, 2016. <http://globalnews.ca/news/2855416/forget-anonymity-internet-trolls-are-more-abusive-when-using-their-real-names-study-finds/?sf32078832=1>

December 1: Whistle blowing, the Politics of Leaking, and Hackers/Journalism

Lisa Lynch, "That's Not Leaking, It's Pure Editorial: Wikileaks, Scientific Journalism, and Journalistic Expertise." *The Canadian Journal of Media Studies*. 2012.
<http://cjms.fims.uwo.ca/issues/special/Lynch.pdf>

Colby Itkowitz, "The heroic professor who helped uncover the Flint lead water crisis has been asked to fix it." *The Washington Post*, January 27, 2016.
<https://www.washingtonpost.com/news/inspired-life/wp/2016/01/26/meet-the-heroic-professor-who-helped-uncover-the-flint-lead-water-crisis/>

Conference Sections: Debating The DNC Leak

Bryan Fung & Andrea Peterson, "America uses stealthy submarines to hack other countries' systems." *The Washington Post*, July 29, 2016. <https://www.washingtonpost.com/news/the-switch/wp/2016/07/29/america-is-hacking-other-countries-with-stealthy-submarines/>

Isaac Chotiner, "Is the DNC Hack an Act of War?" *Slate*, July 25, 2016.
http://www.slate.com/articles/news_and_politics/interrogation/2016/07/is_the_dnc_hack_an_act_of_war_and_is_russia_responsible.html

Kristen Eichensehr, "Cybersecurity, Elections, and Critical Infrastructure at Home and Abroad." *Just Security*, August 4, 2016. <https://www.justsecurity.org/32276/cybersecurity-elections-critical-infrastructure-home/>

Ron Deibert, "How foreign governments spy using PowerPoint and Twitter." *The Washington Post*, August 2, 2016. https://www.washingtonpost.com/posteverything/wp/2016/08/02/how-foreign-governments-spy-using-email-and-powerpoint/?postshare=4961470138208592&tid=ss_tw