

PSCI 1500B: Technology, Nature, Power

Online delivery

Scheduled course time: Friday 9:35-11:25

Weekly discussion classes: Friday, times and places as assigned

Professor: James Meadowcroft

Class workshops/open discussion Monday and Wednesday: 8.30-9.00 and 5.30-6.00

Office hours by appointment on zoom

Email: james.meadowcroft@carleton.ca

Course content, objectives, and outcomes

This course focuses on interactions among technological change, the evolution of social and political order, and the transformation of the environment. It will examine specific technologies, including those that helped to define modernity (the printing press, firearms, chemical fertilizers, automobiles), and those that are shaping the future (the internet, artificial intelligence, bio-science). It will consider how technological trajectories have influenced, and been influenced by, political experiences and institutions including bureaucracy, human rights, inequality, and globalization. And it will link this to the dramatic remolding of our planet (through process such as climate change), and the altering of the human experience of nature.

The course will emphasize the connections among technology, nature, and power -- with power understood in multiple dimensions: including relations among humans, between humans and their technological creations, and between humans and the non-human natural world

It is open to students from a variety of degree programs, and it is intended to encourage dialogue among those who are pursuing different fields of study and contemplating varied career choices. The course will encourage students to develop their critical thinking in relation to these challenging topics, as well as to develop their skills in research and academic writing.

By the end of the course students will be able to:

- demonstrate an understanding of the complex interconnections among technology, social and political order, and the transformation of the natural environment
- demonstrate appropriate cognitive, communicative, and transferable skills, including the exercise of critical judgement, utilising academic literature, developing independent analysis

and argument, writing an appropriately formatted and referenced research paper, and deepening the capacity for independent learning.

Organisation

This course involves both synchronous and asynchronous elements

Synchronous elements include:

- One hour weekly class meeting: Friday 9:30 to 10:25
- One-hour weekly discussion classes: Friday, times and locations as assigned.

Asynchronous elements include:

- Short video lectures uploaded each week before class
- CULearn Forum on-line discussion of reading topics each week
- 'Further study' -- websites and video links on CULearn
- Reading and class preparation

Optional element:

- Class workshop/open discussion about the course with the professor: every Monday and Wednesday: 8.30-9.00 and 5.30-6.00 (weeks 2-11)

Assessment

15%	Online discussion group participation
30%	Reading responses and online discussion
30%	Group animation project, due March 15, 2021
25%	Short research paper, due April 14, 2021

Discussion group participation (15%):

The online seminars will be conducted through Big Blue Button. Although it can be hard to maintain concentration in live online sessions, students will be expected to demonstrate that they are making every effort to participate actively in collective learning. This can be done by contributing to the discussion on the readings, raising questions, drawing attention to examples from current events, or suggesting readings or other material of interest. The expectation is that cameras will be on for these sessions

Students should read the assigned material **before** class each week, think about the discussion questions, and attend all sessions. Marks will reflect attendance and the quality of the contribution made to class.

Reading responses and online discussion:

(a) Reading responses (15%)

Students will take turns writing brief commentaries (700 words each) on class readings over the course of the semester. These commentaries will launch online discussion of each week's theme in

CULearn Forums. These reading responses should go beyond summarizing the reading to *critically assess arguments and provide pertinent observations related to the theme of class*. The commentary should give evidence of thought. They are to be uploaded to the appropriate CULearn Forum by midnight on the Tuesday before the Friday class for which the readings are assigned. (Eg: by midnight on Tuesday January 18, for the class on Friday January 21). Students should be prepared to present their reading response in the online seminar.

(b) Forum contributions (15%)

Students are expected to engage in discussion around the weekly themes in the CULearn forums. The starting point for these discussions will be reading responses posted by students. Students should read the posted reading responses and provide their own reaction to the material in the days leading up to, and following, the online seminar. The instructor may also initiate other forums. Students can post comments, questions, arguments, or links to other material. What is important is **not** the volume of posts (although it is expected that everyone will contribute) but the quality and pertinence of the postings. The key question to ask before posting is: does this contribute to the learning experience of the class?

Group animation project (30%)

Students will work in small groups to research and prepare a short educational video animation to present a topic related to the broad theme of this class -- technology, nature, power. Students will be asked to pick a topic from a list of topics distributed in the first week of class. This assignment involves research, analysis, decisions about the most important elements to present to the audience, and development of a lively visual format. Three elements will determine the mark: (a) the content and form of the finished animation (b) a short briefing note on the research findings explaining the choice of elements to include in the animation and (c) the quality of answers when it is presented to other students. The Instructor will provide detailed guidance to student groups for the development of these projects. All students involved in preparation of the group project will receive the same mark. This is due March 15.

Short research paper: (25%)

This is to be an original piece of work on a theme related to the course. Students are expected to examine material on a specialist subject that goes beyond the course reading list. The paper should have a clear analytical orientation. It is to be no more than 2,500 words long. The topic cannot be substantially the same as that of the group project discussed above.

To ensure success with this project students must consult with their Teaching Assistant (by mid-March) to discuss their potential topic. They will then submit a short outline of the paper together with an annotated bibliography of initial sources; this is to be no more than two pages in total and submitted by March 19. Successful engagement in this planning/preparatory process will be accorded a 20% weighting in the mark for the research paper component of the final grade. Further guidance on acceptable topics and good research essay techniques will be provided over the semester. The paper is due on April 14 and is to be submitted through CULearn.

References should adopt the format of the American Psychological Association. See material on how to reference your paper on the CuLearn course page.

Late assignments without documented leave will be penalized at the rate of three percent per day. All work should be properly referenced and annotated.

Reading and other course materials

There is no textbook for this course. Readings and other course materials are available through CULearn. There are two kinds of course materials:

- *Core readings*: these are mostly academic articles, book chapters, and reports. There are two readings each week to provide an introduction to the issues, an anchor for class discussion, and a basis from which students can extend their investigations.
- *On-line material*: these are additional readings, short commentaries, media sites, and video clips. These provide alternative points of entry into the issues and link to current events and debates.

To get the most from this course, students should explore *both* the core academic readings *and* the additional on-line learning resources. Students may find some of the core academic readings challenging. This is to be expected. Do not be discouraged. You are not meant to memorize the content or grasp all the points of an intricate argument. Rather these readings are intended to broaden your horizons and get you thinking about complex issues in different ways. If you have trouble with some of the core readings, dig into the on-line material for that week -- which typically approach the main theme in a more accessible manner.

Weekly core readings are listed later in this course outline. The supplemental on-line material (and appropriate web links) can be found on CULearn.

The weekly program of activities is fully integrated, so the same set of readings and media apply. Students should ensure that they have done the associated readings and/or viewing **BEFORE** each class. Reading the assigned material is the only way that you will benefit fully from this course.

Administrative Rules

Email communication: all email communication sent to the professor and teaching assistants should have as its subject heading: PSCI 1500. Carleton requires students, staff and faculty to use Carleton email accounts when conducting University business.

Teaching Assistants

The teaching assistants assigned to this course are graduate students with specialist knowledge related to the environment, technology, and politics. Their role is to enrich your experience with

this course. They should be your first port of call with questions about classes, readings, assignments, marks, and the organization of the course.

Course Overview

Week 1: Technology, nature power: an introduction (January 15)

Week 2: A brief history of technology (January 22).

Discussion class 1

Week 3: The evolution of societal organization and power (January 29).

Discussion class 2

Week 4: The transformation of nature (February 5).

Discussion class 3

Week 5: The automobile (February 12).

Discussion class. 4

Week 6: *Winter break: no class (February 19).*

Week 7: Agriculture and food systems (February 26).

Discussion class 5

Week 8: Fossil fuels and climate change (March 5).

Discussion class 6

Week 9: Sanitation, medicines, and health (March 12).

Discussion class 7

Week 10: Conflict and war (March 19).

Discussion class 8

Week 11: The internet, communications, and information technologies (March 26).

Discussion class 9

Week 12: *Statutory holiday: no class (April 2)*

Week 13: Shaping technological futures: robots, AI, designer babies, geoengineering, and space travel? (April 9)

Discussion class 10

Week 14: Technology, nature, power: a synthesis. (April 14)

Research paper due April 14

Detailed course program

PART 1 (weeks 1-4)

The first part of this course offers an overview of linkages among the development of technology, societal organization, and the transformation of the environment. The first lecture introduces the course. The following three lectures offer a tour of human development: first, from the standpoint of technological advance; second, tracking the evolution of social structures and power; and third, in terms of environmental transformations. In each case, the starting point serves to introduce interactions across the other two domains.

Week 1: Technology, nature power: an introduction (January 15)

This session presents the structure of the course and initiates preliminary reflection on substantive issues. The lecture will focus on what this course is about.

- 'Can we define technology'. In *Technology Matters*. David E. Nye. MIT Press, 2007, pp. 1-15.
- 'Technology and history: "Kranzberg's laws"'. Melvin Kranzberg. *Technology and Culture* 27 (1986): 544-560.

No discussion class this week

Week 2: A brief history of technology (January 22)

This session traces the historical development of human technology. It will introduce important concepts applied in understanding socio-technological systems, the social construction of technology and technological change.

Skills element: reading and taking notes. Using the supplementary course material.

- 'Technological systems and industrial society'. In *A Social History of American Technology*. Ruth Cowan and Matthew Hersch. Oxford University Press, 2nd edition, 2018, pp. 107-131.
- 'World history and energy'. Vaclav Smil. In the *Encyclopedia of Energy*, volume 6. Elsevier, 2004, pp. 549-61.

Supplementary material: see CULearn

Discussion class 1: see questions for the week on CULearn.

Week 3: The evolution of societal organization and power (January 29)

The week examines the evolution of human societies and power. The lecture will explore different forms of social power, how social organization influences technological pathways, and the ways technologies help define economic, social, and political power.

- 'The nitrate wars'. Extract from *The Alchemy of Air*. Thomas Hager. Broadway Books, 2008, pp. 25-62.
- 'Do artefacts have politics?'. Langdon Winner. *Daedalus* 109 (1980): 121-136.

Supplementary material: see CULearn.

Discussion class 2: see questions for the week on CULearn.

Week 4: The transformation of nature (February 5)

This lecture explores the transformation of the global biosphere associated with the social and technological development of humankind. Human societies have always (intentionally and unintentionally) transformed their environments. And it will examine the changing scale and scope of the impacts since the second half of the twentieth century.

Skills element: Academic writing: references and plagiarism

- Lead in petrol makes the mind give way. Herbert Needleman and David Gee. In *Late lessons from early warnings: science, precaution, innovation*. European Environment Agency. Report 1/2013, pp. 46-75.
- Planetary boundaries: Guiding human development on a changing planet. Will Steffan et al. *Science* 347, 1259855 (2015). DOI: 10.1126/science.1259855

Supplementary material: see CULearn.

Discussion class 3: see questions for the week on CULearn.

PART 2: (weeks 5-11)

The second part of this course focuses on integrating technical, social and environmental dimensions around six specific cases defined by: the automobile; agriculture and food systems; fossil fuels and climate change; sanitation, medicines and health; conflict and war; and the internet, communications and information technologies.

Week 5: The automobile (February 12)

This week explores the automobile -- a critical twentieth century technological artefact, whose rise was associated with the advent of modern consumer society and the affirmation of US geopolitical power. It will consider transformations currently shaking this industry including vehicle electrification, autonomous vehicles, and alternative mobility regimes.

- 'The city and the car'. Mimi Sheller and John Urry. *International Journal of Urban and Regional Research* 24 (2000): 737-757.
- 'Cars and second order consequences'. Benedict Evans. Comment: March 29, 2017. Available at: <https://www.ben-evans.com/benedictevans/2017/3/20/cars-and-second-order-consequences>

Supplementary material: see CULearn.

Discussion class 4: see questions for the week on CULearn.

Week 6: *Winter break: no class (February 19).*

Week 7: Agriculture and food systems (February 26)

This week focuses on agriculture as a system of production and consumption. Advances in agricultural techniques have allowed a massive expansion of human numbers and transformed global ecosystems.

Skills element: developing a topic for a research essay. Determining a research strategy.

- 'The Columbian exchange: a history of disease, food, and ideas'. Nathan Nunn and Nancy Qian. *The Journal of Economic Perspectives* 24 (2) (2010): 163-188.
- 'How sustainable agriculture can address the environmental and human health harms of industrial agriculture'. Leo Horrigan, Robert S. Lawrence, and Polly Walker. *Environmental health Perspectives* 110 (2002): 445-456. Available at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1240832/pdf/ehp0110-000445.pdf>

Supplementary material: see CULearn.

Discussion class 5: see questions for the week on CULearn.

Week 8: Fossil fuels and climate change (March 5)

This week focuses on climate change, examining its historical emergence, the geopolitical structure of the problem, progress to date and potential solutions. It explores technological options and political strategies.

Skills element: writing a good research paper.

- 'The climate mitigation gap: education and government recommendations miss the most effective individual actions'. Seth Wynes and Kimberly A Nicholas 2017 *Environ. Res. Lett.* **12** 074024.
- 'Let's get this transition moving', James Meadowcroft. *Canadian Public Policy/Analyse de politiques*, 42Sup1 (2016): 10-17.

Supplementary material: see CULearn.

Discussion class 6: see questions for the week on CULearn.

Week 9: Sanitation, medicines, and health (March 12)

Developments in sanitation, medicine and health care have been critical to extending human life expectancy, shaping demographic patterns, and influencing life experiences. This week engages with knowledge, technologies, and power in this domain, dealing with issues ranging from water and sewage systems, to drugs and pharmaceutical companies.

- 'A new global sanitary revolution: lessons from the past'. Ben Fawcett and Maggie Black. 33rd Water, Engineering and Development Centre International Conference, Accra, Ghana, 2008, pp 41-45.
- Two readings from Marc Andre Gagnon on the pharmaceutical industry: (a) 'New drug pricing: does it make any sense'. *Revue Prescrire*, June 2015; 35 (380): 457-461. AND (b) 'Corporate influence over clinical research: considering the alternatives' *Revue Prescrire*, April 2012; 32 (342): 311-314.

Supplementary material: see CULearn.

Discussion class 7: see questions for the week on CULearn.

Week 10: Conflict and war (March 19)

Conflict has been a continuous feature of human society, and warfare and technologies related to war have played a critical role in the development of social systems and ultimately the transformation of the non-human natural world. This class will examine the entwining of civilian and military technologies, considering issues such as the civilian and military applications of nuclear technologies, and the 'military industrial complex'.

- 'Introduction'. *In War and Nature: Fighting Humans and Insects with Chemicals from World War I to Silent Spring*. Edmund Russel. Cambridge University Press, 2001, pp 1-16.
- 'Liberal Preferences as an Explanation for Technology Choices. The Case of Military Robots as a Solution to the West's Casualty Aversion'. Niklas Schornig. In *The Global Politics of Science and Technology*, volume 2, Maximilian Mayer, Mariana Carpes, and Ruth Knoblich, Springer-Verlag, 2014, pp. 67-82.

Supplementary material: see CULearn.

Discussion class 8: see questions for the week on CULearn.

Week 11: The internet, communications and information technologies (March 26)

This week deals with the internet, and the information and communication revolution more generally, looking at the technological trajectory that gave it birth and the social transformations with which it is associated. It will deal with issues such as the power of the 'tech giants', democracy and the manipulation of information, surveillance, on line shopping, social media, the sharing economy', and so on.

- 'Liberation versus control: the future of cyberspace'. Ronald Deibert and Rafal Rohozinski, *Journal of Democracy* 21 (2010), pp. 43-57.

- 'The "sharing" economy: labour, inequality and social connection on for-profit platforms'. Juliet B. Schor and William Attwood-Charles. *Sociology Compass* 11 (2017) e12393. DOI: 10.1111/soc4.12493

Supplementary material: see CULearn.

Discussion class 9: see questions for the week on CULearn.

PART 3 (weeks 13-14)

The final part of the course will focus on technologies which are remaking contemporary society and likely to become even more important in the future. This includes biotechnology, robotics and Artificial Intelligence (AI), the internet of things, geoengineering and space travel.

Week 12: Statuary holiday: no class (April 2)

Week 13: Shaping technological futures? Robots, AI, designer babies, geoengineering, and space travel (April 9)

This will examine technological futures and the extent to which it is possible to control technological development pathways. It will engage with a variety of novel technologies that are reshaping the modern world and that will help define the future: including bio technology, nano technology, AI and robotics, space travel, and radically extending the human life span.

- 'Opening up the politics of knowledge and power in bioscience'. Andy Stirling. *PLoS Biology* 10 (1) (2012) e1001233 doi:10.1371/journal.pbio.1001233.
- Four short readings on emerging technologies:
Designer babies: <https://www.theguardian.com/science/2017/jan/08/designer-babies-ethical-horror-waiting-to-happen>
Geoengineering: <https://news.harvard.edu/gazette/story/2013/10/geoengineering-opportunity-or-folly/>
Artificial Intelligence: <https://futureoflife.org/background/benefits-risks-of-artificial-intelligence/>
Extending the human lifespan: <https://www.newyorker.com/magazine/2017/04/03/silicon-valleys-quest-to-live-forever>

Supplementary material: see CULearn.

Discussion class 10: see questions for the week on CULearn.

Week 14: Technology, nature, power: a synthesis (April 14).

This lecture will draw lessons from discussion over the preceding weeks.

- 'Technological revolutions and techno-economic paradigms'. Carlota Perez. *Cambridge Journal of Economics* 34 (2010): 185–202. doi:10.1093/cje/bep051
- 'The Anthropocene biosphere'. Mark Williams, Jan Zalasiewicz, PK Haff, Christian Schwägerl, Anthony Barnosky and Erle Ellis. *The Anthropocene Review* 2015, Vol. 2(3) 196–219.

Supplementary material: see CULearn.
No discussion class this week.

Accommodations during COVID

Due to COVID, instructors will not request or require a doctor's note when students seek accommodation for missed term work or exams due to illness. Instead, students will be asked to complete the self-declaration form available here: https://carleton.ca/registrar/wp-content/uploads/COVID-19_Self-declaration.pdf

Academic Accommodations

Pregnancy

Please contact your instructor with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details, visit the Equity Services website: carleton.ca/equity/wp-content/uploads/Student-Guide-to-AcademicAccommodation.pdf

Religious obligation

Please contact your instructor with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details, visit the Equity Services website: carleton.ca/equity/wp-content/uploads/Student-Guide-to-AcademicAccommodation.pdf

Students with Disabilities

If you have a documented disability requiring academic accommodations in this course, please contact the Paul Menton Centre for Students with Disabilities (PMC) at 613-520-6608 or pmc@carleton.ca for a formal evaluation or contact your PMC coordinator to send your instructor your Letter of Accommodation at the beginning of the term. You must also contact the PMC no later than two weeks before the first inclass scheduled test or exam requiring accommodation (if applicable). After requesting accommodation from PMC, meet with your instructor as soon as possible to ensure accommodation arrangements are made.

Survivors of Sexual Violence

As a community, Carleton University is committed to maintaining a positive learning, working and living environment where sexual violence will not be tolerated, and is survivors are supported

through academic accommodations as per Carleton's Sexual Violence Policy. For more information about the services available at the university and to obtain information about sexual violence and/or support, visit: carleton.ca/sexual-violence-support

Student Activities

Carleton University recognizes the substantial benefits, both to the individual student and for the university, that result from a student participating in activities beyond the classroom experience. Reasonable accommodation must be provided to students who compete or perform at the national or international level. Please contact your instructor with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. <https://carleton.ca/senate/wp-content/uploads/Accommodation-forStudent-Activities-1.pdf>

For more information on academic accommodation, please contact the departmental administrator or visit: students.carleton.ca/course-outline

Plagiarism

The University Senate defines plagiarism as “presenting, whether intentional or not, the ideas, expression of ideas or work of others as one’s own.” This can include:

- reproducing or paraphrasing portions of someone else’s published or unpublished material, regardless of the source, and presenting these as one’s own without proper citation or reference to the original source
- submitting a take-home examination, essay, laboratory report or other assignment written, in whole or in part, by someone else
- using ideas or direct, verbatim quotations, or paraphrased material, concepts, or ideas without appropriate acknowledgment in any academic assignment
- using another’s data or research findings
- failing to acknowledge sources through the use of proper citations when using another’s works and/or failing to use quotation marks
- handing in "substantially the same piece of work for academic credit more than once without prior written permission of the course instructor in which the submission occurs.

Plagiarism is a serious offence which cannot be resolved directly with the course’s instructor. The Associate Deans of the Faculty conduct a rigorous investigation, including an interview with the student, when an instructor suspects a piece of work has been plagiarized. Penalties are not trivial. They may include a mark of zero for the plagiarized work or a final grade of "F" for the course.

More information on the University’s Academic Integrity Policy can be found at: <https://carleton.ca/registrar/academic-integrity/>

Intellectual property

Student or professor materials created for this course (including presentations and posted notes, labs, case studies, assignments and exams) remain the intellectual property of the author(s). They are intended for personal use and may not be reproduced or redistributed without prior written consent of the author(s)

Submission and Return of Term Work

All work is to be submitted and returned through CULearn

Grading

Standing in a course is determined by the course instructor, subject to the approval of the faculty Dean. Final standing in courses will be shown by alphabetical grades. The system of grades used, with corresponding grade points is:

Percentage	Letter grade	12-point scale	Percentage	Letter grade	12-point scale
90-100	A+	12	67-69	C+	6
85-89	A	11	63-66	C	5
80-84	A-	10	60-62	C-	4
77-79	B+	9	57-59	D+	3
73-76	B	8	53-56	D	2
70-72	B-	7	50-52	D-	1

Approval of final grades

Standing in a course is determined by the course instructor subject to the approval of the Faculty Dean. This means that grades submitted by an instructor may be subject to revision. No grades are final until they have been approved by the Dean.

Carleton E-mail Accounts

All email communication to students from the Department of Political Science will be via official Carleton university e-mail accounts and/or cuLearn. As important course and University information is distributed this way, it is the student's responsibility to monitor their Carleton and cuLearn accounts.

Carleton Political Science Society

"The Carleton Political Science Society (CPSS) has made its mission to provide a social environment for politically inclined students and faculty. By hosting social events, including Model Parliament, debates, professional development sessions and more, CPSS aims to involve all political science students at Carleton University. Our mandate is to arrange social and academic activities in order to instill a sense of belonging within the Department and the larger University community.

Members can benefit through our networking opportunities, academic engagement initiatives and numerous events which aim to complement both academic and social life at Carleton University.

To find out more, visit us on Facebook

<https://www.facebook.com/CarletonPoliticalScienceSociety/> and our website
<https://carletonpss.com/>

Official Course Outline

The course outline posted to the Political Science website is the official course outline.