

Science and Society

Georgetown University
School of Continuing Studies, Master of Arts in Liberal Studies

Fall 2019 LSHV 400 -01 MALS FND

Instructor: John Shook, PhD

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Semester: Aug 28 – Dec 9, 2019

Class Meetings: Tue 6:30pm – 9:30pm at Intercultural Center Room TBD

Office Hours: Tue 4pm – 6pm, or by appointment

Course Description

The history of science and its ongoing discoveries are surveyed, to track methods of empirical inquiry and examine major impacts of scientific theories on the understanding of humans, our capabilities, and our interactions with each other and the world. Scientific and humanistic perspectives upon being human, and on trying to be more human, are often deeply divergent. Yet the methods of scientific inquiry are as cognitively and creatively human as any endeavor we undertake, for better comprehending our humanity and our place in the world. Through the standpoint of science, and innovations in technosciences, it is possible to reimagine and reinterpret how we experience life and engage with the social world. Scientific advances powerfully interact with the cultural context of moral norms, social institutions, political forces, and legal regulations, which in turn shape the utilization of emerging technosciences. This course examines these engagements from the 1940s to the present day and into the perceivable near-future. The course emphasizes the public understanding of science and technology, ethical viewpoints on important technosciences, and broader social impacts due to technoscience on global scales.

Course Narrative and Objectives

Students have the opportunity to ask interdisciplinary questions and consider various answers:

How have science's worldviews and expectations for science changed over the course of the past 400 years?

How have scientific research programs functioned as dynamic social forces altering the human experience and the human quest to improve ourselves?

How have technoscience developments been far from "value-free" enterprises, by manifesting principled values at every stage – from hypothesis and laboratory experiment to the consensus of a scientific community and the concrete application in a new technology?

What kinds of roles have the public understanding of science, and the ethical evaluation of new technoscience, played in the development and deployment of new technologies?

Where can we learn lessons about when and how to examine surprising events at the frontiers of science, so we can deliberate upon our communal priorities and social agendas?

While exploring these questions, students will acquire a facility with the major scientific advances in various scientific and technological fields, along with an appreciation for the history and philosophy of science, the history of technology, science and ethics, and the complexities of science policy.

Students will also achieve individualized learning objectives. Students will:

- explore how controversies over scientific "progress" are always multi-dimensional and many-

layered, rather than just a matter of “pro” or “con”;

- examine different perspectives on the public’s engagement with policy issues arising from scientific and technological innovations;
- imagine how scientific research agendas could have proceeded very differently under different socio-cultural conditions or divergent historical scenarios; and
- join their own voices to ongoing debates about scientific controversies by contributing their well-informed assessments for academic consideration.

Required Texts

Bowler PJ, Morus IR. *Making Modern Science: A Historical Survey*. University of Chicago Press, 2005. ISBN: 978-0226068619. (Readings listed as *MMS* in class schedule)

DeWitt R. *Worldviews: An Introduction to the History and Philosophy of Science*. 3rd Edition. Wiley-Blackwell, 2018. ISBN: 978-1119118893. (Readings listed as *W* in class schedule)

Sandler RL, ed. *Ethics and Emerging Technologies*. Palgrave Macmillan, 2014. ISBN 9780230367036. (Readings listed as *EET* in class schedule)

Additional Readings: Handouts provided during the semester.

Recommended Reading

Agar J. *Science in the Twentieth Century and Beyond*. Polity Press, 2012. ISBN: 9780745634692.

Joshua Schimel. *Writing Science: How to Write Papers That Get Cited and Proposals That Get Funded*. Oxford University Press, 2011. ISBN 978-0199760244

Course Requirements

1. Class Participation. Regular participation in class discussion, and a 15-minute classroom presentation of the term paper (see below). 200 points possible. 20% of total grade.

2. Issue Brief. 1000 words, fully referenced. On a topic chosen from the issues raised during the first 3 weeks of the course. This Brief will outline the significance of a chosen scientific advancement during 1940-2000, by either (a) lending support to optimism about the expanding powers of humanity for beneficial goals, or (b) lending support to pessimism about the tendency of humanity to use new powers in ways far more harmful than helpful. Your Brief must only have an optimistic, or a pessimistic, perspective. Stay close to the facts, but be as persuasive as possible to contemporary readers. 100 points possible. 10% of total grade.

3. Short Paper. 3000 words, fully referenced. On a topic of students’ choice, selected from the course’s topics during the first 5 weeks. This paper will recount the public reception of a specific scientific discovery: how was this discovery’s significance represented to society, how did the social and cultural context react in response, and how were public resources mobilized to produce and use a new technology from that discovery? You will first develop a one-page prospectus outlining your paper’s plan, to be approved by the instructor. 300 points possible. 30% of total grade.

4. Term Paper (5000 words minimum, fully referenced) upon a topic related to the issues covered in this class, except for the scientific discovery chosen for the short paper. This term paper will focus on broader social and global implications from the deployment of a 20th or 21st century scientific advance in concrete technological ways. Those implications should include lasting impacts on social norms and institutions,

problems requiring political and/or legal action, and urgent ethical issues. A successful paper will synthesize relevant information gained throughout the course (lectures and readings), information from a selected body of secondary literature, and the student’s academic background and interests. 400 points possible. 40% of total grade.

Citation Style: The APA Style (APA Publication Manual 6th Edition) is used widely in SCS courses. Consult <http://pitt.libguides.com/citationhelp/APA>

Final Grade

ASSIGNMENT	PERCENT OF TOTAL GRADE	POSSIBLE POINTS
Class Participation	20%	200
Issue Brief – 1,000 words	10%	100
Short Paper – 3,000 words	30%	300
Term Paper – 5,000 words	40%	400
	TOTAL	1000 points

Total Points	Grade	Quality Points
920-1000	A	4.00
900-919	A-	3.67
881-899	B+	3.33
800-880	B	3.00
781-799	B-	2.67
761-780	C+	2.33
700-760	C	2.00
690-699	C-	1.67
680-689	D+	1.33
660-679	D	1.00
Less than 660	F	0.00

Course Policies

Students' Religious Observances: The following is university policy: Georgetown University promotes respect for all religions. Any student who is unable to attend classes or to participate in any examination, presentation, or assignment on a given day because of the observance of a major religious holiday or related travel shall be excused and provided with the opportunity to make up, without unreasonable burden, any work that has been missed for this reason and shall not in any other way be penalized for the absence or rescheduled work. Students will remain responsible for all assigned work. Students should notify professors in writing at the beginning of the semester of religious observances that conflict with their classes.

Disabilities: If you are a student with a documented disability who requires accommodations or if you think you may have a disability and want to inquire about accommodations, please contact the Academic Resource Center at 202-687-8354 or arc@georgetown.edu. Individuals with disabilities have the right to specific accommodations that do not fundamentally alter the nature of the course. Some accommodations might include note takers, books on tape, extended time on assignments, and interpreter services among others. Students are responsible for communicating their needs to the Academic Resource Center before the start of classes to allow time to review the documentation and make recommendations for appropriate accommodations. The University is not responsible for making special accommodations for students who have not declared their disabilities and have not requested an accommodation in a timely manner. Also, the University need not modify course or degree requirements considered to be an essential requirement of the program of instruction. For the most current and up-to-date policy information, please refer to the Georgetown University Academic Resource Center website. Students are highly encouraged to discuss the documentation and accommodation process with an Academic Resource Center administrator.

Extreme weather, Emergencies, and Instructional Continuity: During inclement weather or other emergencies on a day when we are scheduled to meet face-to-face, check the university's Web site or call (202) 687-7669 for information on whether the university is open. If the university is open, this class will meet. If the university is closed, this class will meet through distance means such as online videoconferencing; check your e-mail for a message from me on how we will proceed in that situation. Due dates for written assignments submitted through Blackboard will not be changed due to campus closings. The university recently has acquired the capability to send text messages and recorded messages about emergencies to cell phones and other mobile devices. Sign up on MyAccess.

Georgetown Honor System: All students are expected to follow Georgetown's honor code unconditionally. We assume you have read the honor code material located at <http://scs.georgetown.edu/academic-affairs/honor-code>, and in particular have read the following documents: Honor Council Pamphlet, What is Plagiarism, Sanctioning Guidelines, and Expedited Sanctioning Process. Papers in this course will all be submitted to turnitin.com for checking. Submitting material in fulfillment of the requirements of this course means that you have abided by the Georgetown honor pledge: *In the pursuit of the high ideals and rigorous standards of academic life, I commit myself to respect and uphold the Georgetown Honor System: To be honest in any academic endeavor, and to conduct myself honorably, as a responsible member of the Georgetown community, as we live and work together.*

Plagiarism: In accord with university policy, all incidents of suspected plagiarism or other Honor Code violations will be reported to the Honor Council without fail. If the Honor Council finds that a student has plagiarized or has violated the Honor Code in any other way, the student may receive a grade of F for the course.

Turnitin.com: Students acknowledge that by taking this course all required papers can be submitted for a Textual Similarity Review to Turnitin.com for the detection of plagiarism. Use of the Turnitin.com service is subject to the terms of use agreement posted on the Turnitin.com site.

Sexual Misconduct: Title IX of the Education Amendments of 1972 (“Title IX”) prohibits discrimination based on sex in any educational programs, which includes sexual harassment or any acts of sexual misconduct. Title IX requires the University, upon becoming aware of any incident of sexual harassment and misconduct to respond appropriately to protect and maintain the safety of the University community, including students, faculty, and staff. Georgetown University prohibits sexual misconduct, including sexual harassment, sexual assault, domestic/dating violence, and stalking. Discrimination based on sex, including sexual misconduct and discrimination based on pregnancy or parenting status, subverts the University's mission and threatens permanent damage to the educational experience, careers, and well-being of students, faculty, and staff. Please know that as a faculty member I am committed to supporting survivors of sexual misconduct, including relationship violence and sexual assault. However, University policy also requires me to report any disclosures about sexual misconduct to the Title IX Coordinator, whose role is to coordinate the University’s response to sexual misconduct. Georgetown has a number of fully confidential professional resources who can provide support and assistance to survivors of sexual assault and other forms of sexual misconduct. These resources include:

Jen Schweer, MA, LPC

Associate Director of Health Education Services for
Sexual Assault Response and Prevention

[\(202\) 687-0323](tel:(202)687-0323)

jls242@georgetown.edu

Erica Shirley

Trauma Specialist

Counseling and Psychiatric Services (CAPS)

[\(202\) 687-6985](tel:(202)687-6985)

els54@georgetown.edu

More information about campus resources and reporting sexual misconduct can be found at:

<https://sexualassault.georgetown.edu/get-help>.

Pregnancy Adjustments and Accommodations: Georgetown University is committed to creating an accessible and inclusive environment for pregnant and parenting students. Students may request adjustments based on general pregnancy needs or accommodations based on a pregnancy-related complication. Specific adjustments will be handled on a case by case basis and will depend on medical need and academic requirements. Students seeking a pregnancy adjustment or accommodation should follow the process laid out at: <https://titleix.georgetown.edu/student-pregnancy>.

Class Schedule

This tentative schedule is subject to change as necessary.

Week	Topic	Readings, Events
Week 1. Sept 3	<u>Emerging Technologies, Entrenched Frameworks</u> The development of a scientific/technological area implies a framework of expectations about its meaning and potential. Can science be rationally managed and morally trusted?	<i>MMS</i> : Chaps. 1, 2, 3
Week 2. Sept 10	<u>Biology: Contesting Darwin's Legacy</u> Is science value-neutral? Interpreting the meaning of evolution and the implications of genetics. How is humanity "supposed" to evolve? Ideology and biology. The pursuit of eugenics. Cultural relativism.	<i>MMS</i> : Chaps. 7, 8, 13, 18 Issue Brief due
Week 3. Sept 17	<u>Psychology and Sociology – Sciences of Mind?</u> The separation of empirical psychology from philosophy. The use of intelligence tests during WW I. The emergence of psychiatry and new models of mental disorders. Behaviorism and determinism.	<i>MMS</i> : Chap. 13 Handouts: B.F. Skinner
Week 4. Sept 24	<u>Medicine and the rise of Medical Ethics</u> Life-saving technologies. Patient's rights and the quality of life debate. Euthanasia. Reproductive technologies. Stem cell research. Human subjects research.	<i>MMS</i> : Chap. 19 <i>EET</i> : Chaps. 5, 7, 8, 9 Handouts: Nuremberg Code, Tuskegee Study
Week 5. Oct 1	<u>Physics, Atomics, Warfare</u> Splitting the atom. Dual-use technologies from the military & NASA. Arms races and nuclear proliferation. Radioactive waste and nuclear meltdowns. What is "peaceful" nuclear energy?	<i>MMS</i> : Chap. 11, 20 Handouts: Einstein, Domsday Clock, SALT treaties
Week 6. Oct 8	<u>Aristotle to Copernicus to Galileo</u> The Aristotelian worldview. The Ptolemaic system of astronomy. The mathematical application of epicycles. The Copernican revolution. Galileo and the telescope.	<i>W</i> Chaps 1, 9, 10, 12, 14, 16, 17 Prospectus due
Week 7. Oct 15	<u>Newton to Einstein</u> The Newtonian worldview. The discovery of gravity. Force at a distance? Absolute space, absolute time. The size of the universe. The Einsteinian worldview. Special relativity.	<i>W</i> Chaps 18, 19, 20, 22, 23
Week 8. Oct 22	<u>Scientific Knowledge</u> Scientific method and falsifiability. Realism vs Instrumentalism. What are scientific laws? Are scientific paradigms incommensurable?	<i>W</i> Chaps 2, 3, 4, 5, 7, 8, 21, 25
Week 9. Oct 29	<u>Humanity and Technology</u> Does humanity shape technology, or does technology shape humanity? <i>Homo faber</i> – the tool-user. M. Foucault on biopolitics. N. Postman: from technocracy to technopoly.	<i>MMS</i> : Chaps. 17, 21 <i>EET</i> : Chap. 1, 4 Handouts: Liesen&Walsh, Postman
Week 10. Nov 5	<u>Computers: Designed as Useful Tools, and Thinking Machines?</u> The Turing Test, the debate over computer intelligence, and the threat to the uniqueness of human consciousness and thinking. What will autonomous AI be like? Can AI be held to ethical norms?	<i>EET</i> : Chaps. 23, 24, 25 Handouts: A. Turing, H. Dreyfus, J. Searle Short Paper due
Week 11. Nov 12	<u>Communication and Information Technologies</u> From the radio and TV to the internet, communications have promised to educate and enlighten populations. How are democracy and international relations affected? Anonymity and privacy?	<i>EET</i> : Chaps. 18, 19, 20, 21, 22 Handouts: Lanier, Opderbeck, Ward
Week 12. Nov 19	<u>Environmental Sciences and Ecological Ethic</u> Scientific agriculture and feeding the planet. Ecology as both science and philosophy. The rise of environmentalism. GMOs. The Gaia hypothesis. Climate change and global warming.	<i>MMS</i> : Chap. 9 <i>EET</i> : Chaps. 28, 30–33
Week 13. Nov 26	Student Presentations	Student Presentations
Week 14. Dec 3	Student Presentations	Student Presentations
Week 15. Dec 17	Term Paper	Term Paper Due