

HI 1330 - Introduction to the History of Science and Technology

B Term 2019 / M-T-R-F 8:00-8:50
SL 305

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Course Description:

This class is an introductory course to the modern history of science and technology (HST) and science and technology studies (STS). From a global and comparative perspective, we will examine fundamental debates on the interrelations between science, technology, and society during the past century.

This course has two sections. From week 1 to 4 we will focus on epistemological, theoretical, and methodological approaches to the analysis of science and technology *in* society. We will learn how historians and social scientists think about the role of culture, politics, and objectivity in the making and practice of science and technology. From week 5 to the end of the term, we will use these approaches and skills to examine in depth three case studies: 1) Humans: Race, Genetics, and Biometrics; 2) Computers: AI, Machine Learning, and Big Data; and 3) Animals: Living Organisms and Synthetic Biology.

The primary goal of this course is to collectively think about the lessons that history and the social studies of science and technology can offer to the advancement of democracy in the 21st century. We will pay particular attention to 1) the central place of historical and social analysis in the present and future of STEM fields globally, 2) the interrelations between social/human agents of change and scientific/technological innovations, and 3) the importance of a critical approach to the theory and practice of techno-scientific expertise in modern democracies.

Expectations & Policies

- Students are expected to think critically, communicate their thoughts effectively, and participate in a collaborative community of learning. Please see participation rubric below.
- All students are expected to do the required weekly readings which will form the basis for class discussion and assignments.
- Attendance to all sessions is mandatory. This is part of your final participation grade.
- I have carefully selected all of the readings based on their relevance to current academic and scientific debates, and their contributions to the expected learning outcomes of this course. I reserve the right to change content and reading materials when these will benefit class discussions and student learning. Suggestions may be submitted any time during the term.
- Use of electronic devices in the classroom must be limited to purposes related to class work.
- My responsibility is to 1) guide your learning process, 2) offer my expertise on the content

of this course and the mechanics of academic thinking and writing, and 3) challenge you to think critically about the themes and materials discussed in class.

- Your responsibility is to 1) follow these policies, 2) fulfill the grading requirements, and 3) ask for assistance any time you need it. Critical thinking and academic writing are sometimes challenging tasks that require practice and learning from others. Empower yourself as an active member of this community of learning, and ask your peers and me for guidelines and advice any time you need it.
- As expected, academic dishonesty and plagiarism will result in disciplinary action. For details on what constitutes plagiarism and academic integrity please visit: <https://www.wpi.edu/about/policies/academic-integrity>

Participation Rubric

Class Participation	Excellent	Good	Acceptable	Unacceptable
Answering Questions	Nearly all classes; answers directly refer to materials under consideration, & reflect a careful reading of material.	Most classes; answers indirectly refer to materials, or refer to them in a general manner.	Some classes; answers connected to general discussion if not to specific materials.	Never answer questions
Posing Questions	Nearly all classes; poses questions that are connected to a careful reading of materials.	Most classes; poses questions broadly connected to class materials.	Some classes; poses questions about assignments or materials.	Never poses questions
Responding to Peer Observations	Nearly all classes; engages comments of peers with questions or responses addressed to peer; respectful disagreement.	Most classes; engages discussion with class in general by posing or answering questions; respectful disagreement.	Some classes; asks related questions, supplies additional related observations; engage respectfully.	Disrespectfully responses or failure to respond to peer comments.
Attendance	Never missed a class meeting.	One missed class meeting.	Two missed class meetings.	Three or more missed class meetings.
Extra-Classroom Participation	Engages online & after class discussion; poses questions.	Asks or answers questions online or outside the classroom.	Completes mandatory online assignments (if apply).	Incomplete online assignments; ignores online and extra-classroom discussions.

Course Goals & Learning Outcomes:

By the end of the term, students will have developed the following skills:

- 1) Understand and use a critical analysis framework for the social analysis of global science and technology.
- 2) Understand, analyze, and assess major social processes in the history of modern science and technology.
- 3) Develop and apply tools and skills for critical inquiry, communication and writing, and intellectual independence.

Requirements & Grading:

Participation: 15%

Student Report (800-1000 words): 15%

Student-led Class Discussion: 15%

Advisory Report (1000-2000 words): 20%

Policy Brief: 20%

Digital Communication Project: 15%

Student-led Panel Discussions

In eight sessions during the term, groups will be responsible for leading the class discussion. Each group will be assigned a separate set of readings. They will offer a summary of the main arguments, relevance, and contribution to the class.

- Presentations should actively integrate previous materials and analysis from participants in the classroom.
- The discussion should problematize the findings in the readings and advance on prior knowledge.
- Groups may include short complementary written or audiovisual materials for *in situ* analysis in their segment.
- Final group reports should be submitted previously to the discussion.

Advisory Report:

Individual or group (of 2 or 3) assignment.* As a member of one of their permanent expert commissions, you will be asked to provide your expert advice to the *United Nations Commission on Science and Technology for Development*

- You will receive the task and the precise topic of the report a week prior to the due date.
- You will need to use all that you have learned in this class and make explicit reference to at least seven readings.
- As an advisory report, reproducing what the texts and others have said will not guarantee that your expert opinion will be considered. You will need to develop an argument that explicitly provides evidence from the readings and build upon their arguments, but that offers a unique and innovative approach to the future of foreign policy and international development.

Policy Brief:

Individual or group (of 2 or 3) assignment.* As a recently trained scholar of environmental history, you will be asked to provide a policy brief on the area of your expertise.

- The topic and area of the brief should reflect your own professional interests and what you have learned in this class (pick a topic that makes you happy and excited about).
- It should include at least 10 readings from this class and any other you might consider relevant (remember you are the expert).
- The policy brief should include a summary of key points and other visual organization that would help decision-makers understand your arguments and recommendations. For an example, take a look at the policy brief posted on Canvas.

** If you decide to work in groups for the advisory report and the policy brief, consider that the level of analysis should reflect the work of two (or more) analytical minds.*

Digital Communication Project:

This assignment is based on your policy brief. Along with writing a professional and well-documented policy brief for decisionmakers and authorities, you will be asked to provide a digital communication project where you translate your expert advice for non-expert audiences. This might take the shape of a blog post, a podcast, a short documentary, a board game, or infographics. Format is open and can vary depending on the nature of the issue and its stakeholders.

The available grades are:

- **A** grade denotes *excellent work* that attains all of the project goals and learning outcomes. The product and process of the work meet all of the expectations and *exceed* them in several areas.
- **B** grade denotes a *consistently good work* that attains the project goals and learning outcomes. The product and process of this work *meet but generally to not exceed* all of the expectations.
- **C** grade denotes *acceptable work* that partially attains the project goals and learning outcomes. The product and process of this work *meet some but not all* expectations. The work may be satisfactory, but the quality is less than anticipated.
- **NR** grade denotes work that did not attain the project goals or learning outcomes and is *insufficient for registered credit*. Both product and process were inconsistent with acceptable project work at WPI as outlined above.

Resources

Writing Center

Located on the second floor of Salisbury Labs (SL 233), the Writing Center is a valuable resource for helping you improve as a writer. Writing Center tutors are your peers (other undergraduate and graduate students at WPI) who are experienced writers themselves and who enjoy helping others tackle writing challenges. Although a single tutoring session should never be seen as a quick fix for any writing difficulty, these sessions can help you identify your strengths and weaknesses, and teach you strategies for organizing, revising, and editing your course papers, projects, and presentations. Writing Center services are free and open to all WPI students in all classes, and tutors will happily work with you at any stage of the writing process (early brainstorming, revising a draft, polishing sentences in a final draft). Visit the Writing Center website <wpi.edu/+writing> to make a 45 minute appointment.

Office of Disability Services

The Office of Disability Services (ODS) coordinates accommodation service and provides advocacy and support to assist students with documented physical, learning, sensory, psychological, developmental, and other disabilities in achieving their full potential. The office strives to foster an environment that supports and encourages self-advocacy, independence, and personal growth. Visit <https://www.wpi.edu/student-experience/resources/disability-services> for more information

Gordon Library

The research librarians at Gordon Library can assist you with a variety of research questions related to locating and citing sources. There is an online chat service on the library webpage. You may also schedule a research meeting with a librarian by visiting tinyurl.com/wpilibrary or writing to library@wpi.edu

Research, Citation, and Style Guides

For an overview of the research and writing process, from formulating questions, reading critically, building arguments, and revising drafts, consult: <https://www.wpi.edu/library/research/citation-tools>. It includes information on citation styles. History papers generally follow the Chicago style, but you may use another system such as MLA or APA as long as you follow it consistently.

Course Schedule

Week 1. Introduction: Bodies, Knowledge(s), and Translation

- Oct. 22: No assigned readings
- Oct. 24: Clapperton Chakanetsa Mavhunga, *The Mobile Workshop. The Tsetse Fly and African Knowledge Production* (MIT Press, 2018) [Introduction]
- Oct. 25: Ulrike Felt, Rayvon Fouché, Clark A. Miller, and Laurel Smith-Doerr, “Introduction to the Fourth Edition of the Handbook of Science and Technology Studies,” in *The Handbook of Science and Technology Studies*. Fourth Edition (MIT Press, 2017)

Week 2. Studying Science and Technology *in Context*

- Oct. 28: Matthew Wisnioski, *Engineers for Change. Competing Visions of Technology in 1960s America*, (MIT Press, 2012) [Introduction and Chapter 7: Making Socio-Technologists]
- Oct. 29: Tomas Robertson, Cold War landscapes: towards an environmental history of US development programmes in the 1950s and 1960s. *Cold War History*, 16 (4), 2016.
- Oct. 31: Claperton Chakanetsa Mavhunga, “Preface” and “Introduction: What Do Science, Technology, and Innovation Mean from Africa?” in Claperton Chakanetsa Mavhunga, ed., *What Do Science, Technology, and Innovation Mean from Africa?* (MIT Press, 2017)
- Nov. 1: Arturo Escobar, *Encountering Development: The Making and Unmaking of the Third World* (Princeton University Press, 2011) [Chapter 1: Introduction: Development and the Anthropology of Modernity]

Week 3. Objectivity, Quantification, & Authority

- Nov. 4: Theodore M. Porter, “Objectivity as Standardization: The Rhetoric of Impersonality in Measurement, Statistics and Cost-benefit Analysis,” in A. Megill, ed. *Rethinking Objectivity* (Duke University Press, 1994)
- Nov. 5: Peter Galison, “The Journalist, the Scientist, and Objectivity,” in Flavia Padovani, Alan Richardson, and Jonathan Y. Tsou, eds., *Objectivity in Science. New Perspectives from Science and Technology Studies* (Springer, 2015)
- Nov. 7: M. L. Ambrose, Lessons from the avalanche of numbers: Big data in historical perspective. *I/S: A Journal of Law and Policy for the Information Society*. 11(2), 2004.
- Nov. 8: Soraya Boudia and Nathalie Jas, Introduction: Risk and “Risk Society” in Historical Perspective. *History & Technology*. 23(4), 2007.

Week 4. Place, Power, and Politics

- Nov. 11: Neal Gilman, “Modernization theory, the highest stage of American intellectual history.” in Engerman, D. Gilman, N., Haefele, M. and Latham, M., eds. *Staging growth. Modernization development, and the global Cold War*, (University of Massachusetts Press, 2003)
- Nov. 12: Naomi Oreskes, “Introduction” + “Science in the Origins of the Cold War,” in *Science and Technology in the Global Cold War* (MIT Press, 2014)
- Nov. 14: No assigned readings
- Nov. 15: No assigned readings
Advisory Report Due

Week 5. Humans: Race, Genetics, and Biometrics

- Nov. 18: No Assigned Readings. First Workshop
- Nov. 19: No Assigned Readings. Second Workshop
- Nov. 21: Ramya M. Rajagopalan, Alondra Nelson, and Joan H. Fujimura, “Race and Science in the Twenty-First Century.” In *The Handbook of Science and Technology Studies*. Fourth Edition (MIT Press, 2017)

Nov. 22: Myles W. Jackson. 2015. *The Genealogy of a Gene: Patents, HIV/AIDS, and Race*. [Chapter 8: Race, Difference, and Genes.]

Week 6. Computers: AI, Machine Learning, & Big Data

Nov. 25: David A. Mindell, *Between Human and Machine. Feedback, Control, and Computing before Cybernetics* (MIT Press, 2002) [Introduction: A History of Control Systems]

Nov. 26: Zeynep Tufekci, “Engineering the public: Big data, surveillance and computational politics,” *First Monday*, Volume 19, Number 7, 2014.

Week 7. Animals: Living Organisms and Synthetic Biology

Dec. 2: Hannah Landecker, *Culturing Life: How Cells Became Technologies* (Harvard University Press 2007) [Introduction: Technologies of Living Substance]

Dec. 3: Gregory E. Kaebnick and Thomas H. Murray, “Introduction,” in Gregory E. Kaebnick and Thomas H. Murray eds. *Synthetic Biology and Morality. Artificial Life and the Bounds of Nature* (MIT Press, 2013)

Dec. 5: Third Workshop

Dec. 6: Fourth Workshop

Week 8. The uses of history in the future of innovation

Dec. 9: Final Projects Presentations

Dec. 12: Final Projects Presentations

Dec. 13: Final Projects Presentations

Policy Brief and Digital Communication Project Due