

LPS/HISTORY 60: Making Modern Science

Course Syllabus

Instructor Information

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Office Location: ZOOM

Office Hours: By appointment

Course Information

Title: Making Modern Science

Session: Summer II

Location: Online

Welcome to Making Modern Science!

Why do we trust science? Should we? What makes something “scientific” in the first place? Is scientific research really objective, or is it shaped by human values?

In this course, we'll explore these questions through the history and philosophy of modern science. Using case studies from cosmology, biology, medicine, and artificial intelligence, we'll examine how scientific ideas develop, how changes in science occur, and how social, political, and ethical values influence scientific communities and their research.

In the broadest sense, we'll begin by asking what science is, move through historical case studies that show what it looks like in practice, and conclude by considering how we should evaluate scientific claims in the wild. Along the way, we'll encounter famous figures such as Copernicus, Darwin, Turing, and others, and look at contemporary issues including AI, corporate interests in research, and gender bias in medicine.

Office Hours and Contact:

Since the course is online, office hours will be held primarily on ZOOM; however, if you benefit from in-person learning more, I'm happy to meet in person on UCI campus. In any case, if you'd like to meet with me, [please reach out via email to schedule an appointment, at least a few days in advance.](#) The more notice you give me, the more availability I will have.

If you have questions about the course, the content of the course, or anything else, please [email me—I will not respond to Canvas messages.](#)

During weekdays, 9 am–5 pm, I am generally at my desk and will do my best to respond to them promptly, but during evenings, major grading deadlines, and weekends, my responses are slower. If I haven't responded to your email, please wait 48 hours before emailing me again.

If you're not familiar with sending emails to an instructor, your emails to me should look something like this:

Dear Ms. Cotton,

I had a quick question about the Week 1 readings. In the reading guide, you mentioned that we should focus on Oreskes's main argument rather than on each specific philosopher she mentions. I was wondering whether we should still take notes on those sections, or if it's okay to skim them.

When you have a chance, could you let me know?

Thanks for your help!

Jane Doe

Course Materials:

There are no required materials for the course. All required readings will be made available through Canvas or through links to outside resources.

Disclaimer on Course Content:

This course may broach potentially sensitive topics related to, among others, politics, sexuality, race, gender, and religion. Some of us may have especially strong views associated with these topics, and we should be mindful and respectful of one another. I expect *all* discussions in this course to be conducted in an academically respectable manner.

Disagreement and debate are expected. What isn't welcome is speech that demeans or dehumanizes people based on who they are. Challenge ideas vigorously—but attack the ideas, not the person saying them. Students who fail to show others respect will face appropriate consequences.

Reading Schedule:

This is a condensed, summer course. It will move fast, but I've tried to make the amount of reading fair and manageable. Reading philosophy (and science) can be quite challenging, and may take multiple read-throughs. Just like many skills, it takes practice, so please don't be discouraged if things aren't immediately clear.

Some readings include guidance on Canvas indicating which sections should be read most carefully. Unless otherwise noted, students are expected to complete the assigned reading in its entirety.

Week 1: What is science? What is the history of science?

1. "The History of Science and the History of Knowledge" – Lorraine Daston
2. "Ch. 1 Why Trust Science," from *Why Trust Science* – Naomi Oreskes (see reading guide on Canvas)

Week 2: Cosmology and scientific revolutions

1. "Ch. 2 The Route to Normal Science," from *The Structure of Scientific Revolutions* – Thomas Kuhn
2. "Ch. 9 The Nature and Necessity of Scientific Revolutions," from *The Structure of Scientific Revolutions* – Thomas Kuhn

Week 3: Biology, gender, and sexism in science.

1. "What Did Darwin Do?," blog post from the Paleontological Research Society:
<https://www.priweb.org/blog-post/what-did-darwin-do>
2. "Gender and the Biological Sciences" – Kathleen Okruhlik
3. WATCH "The Great Sperm Race," YouTube video:
<https://www.youtube.com/watch?v=OrVLJ6YIZoY>

Week 4: Can Machines do science? Whose values do they reflect?

1. "Computing Machinery and Intelligence," – Alan Turing (see reading guide on Canvas)
2. "Biased bots: Artificial-intelligence systems echo human prejudices," – Princeton Engineering Blog:
<https://engineering.princeton.edu/news/2017/04/18/biased-bots-artificial-intelligence-systems-echo-human-prejudices>
3. "Has AlphaFold actually solved biology's protein-folding problem?" – ScienceNews:
<https://www.sciencenews.org/article/alphafold-ai-protein-structure-folding-prediction>

Week 5: Putting it all into practice, or, "on bullshit science"

1. "Ch. 12 The Fine Art of Baloney Detection," from *The Demon-Haunted World* – Carl Sagan
2. "Why Most Published Research Findings Are False," John P. A. Ioannidis

Grading:

Assignment	Description	%
Introduction Post	Week 1: Introduce yourself on Canvas and respond to at least one of your peers.	5%
Syllabus Quiz	A Week 1 syllabus quiz.	5%
Material Quizzes	Beginning in week 2: Weekly timed quizzes. These will have both multiple-choice questions and essay questions. Quizzes may incorporate material from previous weeks. Quizzes will have a window of time during which you may begin them, but they must be completed within the allotted 30 minutes.	40%
Discussion Posts	Beginning in week 2: Weekly Canvas discussion posts responding to a prompt, plus one substantive reply to a classmate's post. You will be graded on participation and general comprehension. To make a good grade in this category, you want to show that you've engaged with the material and that you've thought about it some on your own. This means that your posts address the prompt, reference course material, and contribute original thought. You need not write a long essay or pose 20 questions.	30%
Short Essays Written Assignment	A final writing assignment for the course, composed of several prompts to choose from and respond to. The assignment will be distributed in week 3, and due at the end of week 5. It will be submitted via a Google Docs link, and you must grant me edit access so I can see your revision history and verify that you wrote the assignment yourself. A grade will not be given to assignments that fail to grant me this access, and for assignments that fail to demonstrate realistic editing access of the document.	20%

Grading Scales:

Grade	Range
A+	> 96.5%
A	93.5% – 96.49%
A-	90.0% – 93.49%
B+	86.5% – 89.99%
B	83.5% – 86.49%
B-	80.0% – 83.49%
C+	76.5% – 79.99%
C	73.5% – 76.49%
C-	70.0% – 73.49%
D+	66.5% – 69.99%
D	63.5% – 66.49%
D-	60.0% – 63.49%
F	< 60.0%

Late Work:

Because this course is online, with ample time to complete assignments, I do not accept late work barring extreme, extenuating circumstances (e.g., severe illness requiring hospitalization, bereavement, or other unforeseen emergencies). Please contact me if you think any of this applies to you.

Policy on Academic Dishonesty:

All work that you produce and submit in this course must be your own. Cheating and plagiarism, as defined here (<https://conduct.uci.edu/academic-integrity/>) by UCI, will not be tolerated. Violations of academic integrity will be reported to the university and may result in failure of the course.

Policy on the Use of AI:

I'm not inherently anti-AI, but I am pro-critical thinking. I believe that there are responsible ways to use AI as a tool without jeopardizing your development of those critical thinking skills, but only if we work together and engage with it honestly as one of many tools.

What this looks like in practice: Do not use AI to wholesale generate your writing for your assignments, quizzes, or responses. This is cheating and will be penalized as such. It's cheating because you're not doing any of the important work of thinking it through on your own. Not only is this bad for learning and against policy, but it will come back to bite you.

But if you want to use an AI grammar checker, automated citation maker, brainstorming tool, or similar, feel free to use it. I ask, however, that you disclose your use of these tools per assignment, and that you not use AI for every single part of the process. For example:

**This assignment was polished for grammatical clarity using Grammarly*

OR

**I used Claude to help me restructure the argument in my discussion post, but the central idea and writing are my own.*

Additionally, I suggest not using AI for summarizing the readings, because it's simply not going to give you an in-depth enough understanding of the material to pass the course. Don't use AI to write for you because it's a bad writer and won't produce work that affords a good grade.

If you're not sure if a specific tool is fair to use or not, please just send me an email. There is basically no official university guidance on how to handle AI, and the best guidance I'm going to get is by talking to you all about what you think is fair, and what actually helps you learn vs. what feels lazy.

Final Note:

I care about helping you meet your academic goals, and I understand you're likely juggling multiple commitments. Open and honest communication is the best way to work with me. If you are worried about falling behind, then please contact me as soon as possible.

Campus Resources:

Disabilities Services Center (DSC) (<https://dsc.uci.edu/>): If you feel that you may need particular accommodations in this course, please contact the DSC as soon as you can to ensure the appropriate accommodations are provided in a timely manner.

UCI VPN (<https://www.oit.uci.edu/services/security/vpn/>): The UCI VPN allows you to access many of its online resources even when off-campus. Click the link for instructions on how to set it up.

The Writing Center (<https://writingcenter.uci.edu/>): The Writing Center offers free feedback and advice on papers. Appointments can be made online, and peer tutoring is available on a first-come, first-served basis.

UCI Libraries (<https://www.lib.uci.edu/>): UCI's libraries are an excellent source of research materials. They house tens of thousands of physical books and provide access to a wide variety of academic journals and publishers.

The Counseling Center (<https://counseling.uci.edu/>): The Counseling Center offers a variety of professional mental health and wellness services.

The Basic Needs Hub (<https://basicneeds.uci.edu/>): The Basic Needs Hub provides a variety of services for students facing food and housing insecurity. I encourage you to familiarize yourself with their various programs.

Links to Various Journals for History of Science, Technology, Medicine, and Philosophy of Science:

Annals of Science (<https://www.tandfonline.com/journals/tasc20>)

British Journal for the History of Science
(<https://www.cambridge.org/core/journals/britishjournal-for-the-history-of-science>)

Centaurus (<https://www.brepols.net/series/CNT>)

Historical Studies in the Natural Sciences (<https://online.ucpress.edu/hsns>)

History and Philosophy of the Life Sciences (<https://link.springer.com/journal/40656>)

Journal of the History of the Behavioral Sciences
(<https://onlinelibrary.wiley.com/journal/15206696>)

Journal of the History of Biology (<https://link.springer.com/journal/10739>)

History of the Human Sciences (<https://journals.sagepub.com/home/hhs>)

History of Science (<https://journals.sagepub.com/home/HOS>)

Isis (<https://www.journals.uchicago.edu/toc/isis/current>)

Osiris (<https://www.journals.uchicago.edu/toc/osiris/current>)

HOPOS (<https://www.journals.uchicago.edu/toc/hopos/current>)

Hypatia Special Issues in Feminism and Science
(<https://onlinelibrary.wiley.com/toc/15272001/2004/19/1>)

Perspectives on Science (<https://muse.jhu.edu/journal/163>)

Studies in History and Philosophy of Science
(<https://www.sciencedirect.com/journal/studies-in-history-and-philosophy-of-science>)