

LPS/HIST 60: Making Modern Science

Adam J. Chin (he/him) | Time | Location

1 Course Logistics

Contact: achin6@uci.edu

Office Hours: TBA; via Zoom or in SST 740/742

TA: [Name], [email]

TA Office Hours: [Day, Time]

Course Website: Canvas

Required Text: N/A; all texts will be made available online!

Course Description: This is one of the most important classes you could take in college. It concerns Science, its history, and its social place. Science, as we all know, is a very significant part of the modern world. But what exactly **is** it? And **why** is it so significant? This course will explore these questions from a variety of perspectives drawn from the history, philosophy, and sociology of science. Galileo Galilei, a 16th c. Italian astronomer, will serve as our central starting point from which we'll build up to understanding science in the 21st century. Among other things, we'll think about why Isaac Newton hated hypotheses, read about scientists extracting light from cucumbers, and dissect contemporary STEM propaganda (replete with smiling children). There will be goats and the class will be run like an RPG. (**No prerequisites.**)

2 Course Goals and Objectives

This course fulfills UCI's GE categories II (Science and Technology) and IV (Arts and Humanities). The course goals for these requirements can be found [here](#). In particular, this course aims to enable students to

- explain the scope and limitations of scientific inquiry and the scientific method (GE II),
- think critically about how meaning is created and how experience is variously interpreted (GE IV), and further
- understand science from a variety of disciplines, and
- comprehend a variety of writing styles from across genres and time periods.

In order to achieve the above goals, you will:

- read and analyze primary scientific and natural philosophical sources from throughout the history of science;
- discuss changes in the public perception of science; and
- relate material—both historical and contemporary—to concepts drawn from philosophy, history, and sociology of science in written form.

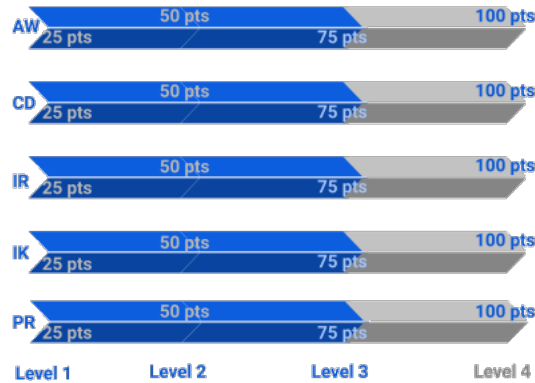
3 Quests/Assignments

This class has a very non-standard grading format!

Imagine that you're role-playing a character in a game. That game is this class. You have five main skills, corresponding to the five skills this course aims to build: Analytic Writing (AW), Collaborative Discussion (CD), Intergeneric Reading (IR), Interdisciplinary Knowledge (IK), and Perceptive Reflection (PR). Each of these skills has four levels. You'll gain a level in a skill every 25 points you gain in that skill.



This is you.



Throughout this course there will be various quests, or assignments, which will help you/your character build the skills. **No quest/assignment is mandatory.** However, at the end of the quarter, you—and your character—will be assessed based on how much you've built up your skills, so you'll need to do many of the quests if you want to pass the class!

This list indicates how grades will be assigned based on your skill levels:

- A+: Level 4 in three skills; level 3 in two skills
- A: Level 4 in one skill; level 3 in four skills
- A-: Level 3 in all skills
- B+: Level 3 in four skills; level 2 in one skill
- B: Level 3 in three skills; level 2 in two skills
- B-: Level 3 in one skill; level 2 in four skills
- C+: Level 2 in all skills
- C: Level 2 in three skills; level 1 in two skills
- D: Level 1 in all skills

And here is a list of types of quests/assignments sorted by the skill(s) they will build:

3.1 Analytic Writing (AW)

Writing Projects (30 AW points each): You'll have the opportunity to complete three Writing Projects, though I only expect students to do two. Each Writing Project is associated with one of the course's three main modules (see schedule below) and will involve a 300-500 word assignment engaging with the module's material/method. The exact nature of the

project will vary based on the module, but it will never be a “traditional” argumentative essay.

Instructions and rubrics for these assignments will be posted to Canvas.

3.2 Collaborative Discussion (CD)

Discussion Section Participation (10 CD points each): Attendance at your weekly discussion section is *highly encouraged*. During these sections, your TA will review material we have covered in the course and also help you work through and understand the course readings. Participation in these will prepare you for the quizzes and the writing projects. The particular way in which your Discussion Section points are awarded will be determined by the TA.

Office Hour Attendance (3 CD points each): The Instructor and TA are paid to be there for you. Each week we will each have a total of 2 hours *entirely dedicated to you* during which we'll be in our offices (or somewhere). Ideally you'll come to these to talk about the course: you can come with questions about the material, ask for help on the assignments, get clarification on the course structure, etc. But you can also just stop by to have a chat with us about life, grad school, goats, or whatever else. There's no need to come prepared with things to talk about; if you have questions, that's great—but if you don't that's also perfectly fine and we'll ask you some questions of our own to get to know you better. And don't worry, we won't be trying to quiz/test your knowledge or skills!

3.3 Intergeneric Reading (IR)

We'll be reading texts from a variety of disciplines. Some days we'll be looking at 300 year old textbooks; others we'll be reading 13 year old textbooks. Some days we'll be reading fiction; others we'll be reading academic papers. Sometimes we'll look at things from a historical perspective, sometimes from a philosophical one. Basically, we'll be reading lots of things in lots of different forms. The main way to build your IR skill is through:

Reading Checks (5 IR points each): Each class meeting will have an assigned set of readings accompanied by questions to check your comprehension. Each reading will be posted to Perusall, where you'll also be able to find the relevant questions. These questions will help to highlight important takeaways. Each reading will feature a number of question options; you get to choose the questions that most interest you, but for each Reading Check you must choose and answer two (2) questions. Instructions on how to use Perusall will be provided during our first class session, and you'll get to try it out with a syllabus-centered exercise.

3.4 Interdisciplinary Knowledge (IK)

This class operates at the intersection of many different disciplines: history, philosophy, sociology, the sciences, literature, just to name a few. These disciplines often operate in very different ways. Knowing how to work between the disciplines is thus essential to doing well in the class. You'll get your IK in a variety of ways, but one fun thing we'll do is:

SCAvenger Hunt (20 IK points): To help familiarize you with the Special Collections and Archives (SCA) located on campus, you will complete a short worksheet activity which

will require you to physically visit the SCA and also explore their digital repositories. This assignment will help prepare you for doing the primary source research required for your Final Project, and for WPs II and III (if you chose to do them).

The SCAvenger Hunt will be accompanied by a class tour of the SCA taking place during lecture in Week 5. If you believe you may need accommodations for this assignment, please contact me as soon as possible.

3.5 Perceptive Reflection (PR)

Surveys (5 PR points each): Over the course of the quarter, we will ask you to complete five surveys: a pre-course survey during week 1, two mid-quarter surveys (one for your TA, one for me), and two end-of-quarter surveys (the EaterEvals released for your TA and me). For each survey you complete, you will receive one WiLD ToKeN which can be used to boost your skills in various ways (see below).

Reflections (10 PR points each): You will be asked to reflect on your understanding of science five times throughout the quarter. You'll respond to the question, "What is science?", possibly in addition to another small prompt (e.g. "And based on that, does your major qualify as a science?"). Your response will be between 100-200 words and will be shared (anonymously) with your peers on a privately viewable GoogleDoc.

3.6 Multi-Skill Quests

Some quests will help you build multiple skills at once!

In-Class Activities (5 points; type varies): There will be an activity during almost every lecture. The particular activity will vary, as will the skill it helps you build. Come to class every day to make sure you get all that XP!

In-Class Quizzes (10 IR points and 10 IK each): There will be four short in-class quizzes, occurring during Weeks 1, 4, 7, and 10. Each exam will include three (easy) multiple choice questions based on lecture content and a short passage analysis drawn from the readings of the previous weeks. These quizzes will help to highlight the important aspects of each module and give you further passage analysis practice.

Final Project (30 AW, 10 AR, 10 IK points, with option for 10 CD points): Your final project will involve a fake interview with a relevant historical figure of your choice. The interview can be submitted as a written transcript, a podcast, a video, or some other appropriate format. You can either do this on your own or in a group of two, though group projects cannot be a mere written transcript (though they could be a letter correspondence). Group projects will provide the opportunity to receive an additional 10 CD points. More precise instructions for the Final Project, including a rubric and a list of suggested historical figures, will be released in Week 8.

WiLD ToKeNs (5 points; type varies) For each survey you complete, you will receive one WiLD ToKeN which can be used to boost your points in a skill of your choice. Each WiLD ToKeN is worth 5 points in one skill; they cannot be broken up into smaller point increments

and distributed among multiple skills. You can, however, use multiple WiLD ToKeNs to boost the same skill.

In order to use a WiLD ToKeN, you will submit a form on Canvas [link], which will ask you which skill you'd like to improve. Your grade will then be updated by the end of the week.

4 Course Policies

4.1 Academic Dishonesty

All work that you produce and submit in this course must be your own. Cheating and plagiarism, [as defined here by UCI](#), will not be tolerated. Violations of academic integrity will be reported to the university and may result in failure of the course.

4.2 Absences and Make-Up Quizzes

Attendance in lecture is technically optional—however, remember that quizzes will be administered in class during lecture. On the other hand, **attendance in discussion is mandatory**. However, notice that the grading scheme allows one unexcused absence (that is, you can choose to not show up and not tell the TA about it beforehand, and you won't be penalized). The TA will decide on a late policy.

If you believe that you will be unable to take one of the quizzes in person at the assigned time (see [\(Tentative\) Course Schedule](#) below), please let me know at least 24 hours in advance so we can schedule a make-up. Otherwise, missed quizzes will receive no credit.

4.3 Late Submission Policy

Late WPs will be accepted but will suffer 10% for each calendar day they are late after the first 24 hours past the due date, for a maximum of -50%.

Except in extremely exceptional circumstances, I will not accept your Final Project past the posted deadline ([DATE]). If you think you'll be unable to turn it in on time, please contact me as soon as possible.

4.4 Discussions

This course will broach potentially sensitive topics related to, among others, race, gender, and religion. As such, it is important to keep in mind that some may have especially strong views associated with these topics, and that those views ought to be respected. I expect all discussions in this course, whether in-person or online, to be held in an academically respectable manner. This includes allowing others to fully express themselves (by not interrupting them) and responding respectfully (by addressing the ideas and not attacking the person). If you have nothing nice to say, don't say anything. Students who fail to comply with basic rules of conversational etiquette will face appropriate consequences—which may include reporting to the university, removal from the classroom, and/or failure of the course.

5 How to Succeed in this Course

This course will feature lots of discussion, a fair amount of reading, and a bit of writing. To do well, you'll need to make sure you **stay on top of the readings** so that you can partake in our discussions—which will be important for helping you complete the WPs. As such, you'll need to make sure to do all of the readings for a particular day **before that day**. I have tried to keep the readings short and interesting. The reading-check questions on Perusall are also meant to help guide you through the readings—which you'll also discuss in your discussion sections.

To do well on the WPs, make sure to **pay attention to our lecture discussions** and attend your weekly discussion section! What we do in lecture and section will help to serve as a model for the kind of analysis I expect in the WPs and Final Project. Grading rubrics will be posted to Canvas, so make sure to look at those! And if you ever have any questions, please don't hesitate to email me or your TA!

Finally, **actually send me and your TA emails and come to our office hours!** If you ever have further questions, want something clarified, are looking for reading suggestions, or just want to talk, we are here and happy to help however we can. If our normal office hours don't work, just send us an email and we can work out another time.

6 How to Write an Email

Here's a template for writing emails to me (the instructor) and your TA. Feel free to use this when contacting us! (Note text in [square brackets] represents a place where you fill in the relevant details—don't include the square brackets!)

Subject: LPS/HIST 60 — [Something that describes your question/comment]

Body:

Hi/Hey Adam,¹

My name is XXX and I'm in your LPS/HIST 60 class. [Insert question/comment]

Thanks!

[Your Name]

7 Campus Resources

IMPORTANT: If you feel that you may need particular accommodations in this course, please contact the [Disabilities Services Center \(DSC\)](#) as soon as you can so that they can make sure the appropriate accommodations are made in a timely manner. If you feel comfortable, please also notify me so that I can make sure the accommodations are actually implemented. The DSC can be reached at 949-824-7494 and/or through their website. Please note that in order to request accommodations, you must first [register](#) through the DSC.

¹Please note that this kind of salutation may not be appreciated or appropriate for other instructors. The **safest** salutation is "Dear Prof. XXX". But feel free to use whatever you'd like with me!

The following are a number of other campus resources that you might find useful as you navigate your way through this course (and general college life!):

- UCI offers a [free VPN](#), which allows you to access many of its resources online even when off campus. Click the link for directions in setting it up.
- 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 most days of the week. If making an appointment, it's suggested that you try to do so during the first week of the quarter or else on Thursday/Friday afternoons/evenings.
- UCI's [libraries](#) are an excellent source of research materials. They not only house tens of thousands of physical books, but also provide access to a wide variety of academic journals and publishing houses.
- The [Counseling Center](#) offers a variety of professional mental health and wellness services. They are open Monday-Friday from 8am-5pm and can be reached at 949-824-6457.
- The [Basic Needs Hub](#) provides a variety of services for students experiencing food and [housing](#) insecurity. I encourage you to familiarize yourself with their various programs.

8 Other Resources

Here are a few resources related to the course material.

[The Newton Project](#)—online collection of (almost!) all of Newton's work, including his mathematical, physical, alchemical, and (incredibly extensive) religious writings, as well as documents from his time at the Royal Mint.

[Project Vox](#)—website dedicated to bringing to light "non-canonical" philosophical/scientific figures from the early modern period (roughly 1500-1800), especially women.

[Early English Books Online \(EEBO\)](#)—online collection of a vast number of English-language books from 1470-1700. Access through UCI internet/[VPN](#).

9 (Tentative) Course Schedule

| Module | Week | Date | Topic(s) | Readings |
|------------------|------|-------------------------|--|---|
| Intro | 1 | Tu | What is this Class? Syllabus | |
| | | Th | What is Science? Who is Galileo? How to Read | SEP on Galileo, §1-2; Heraclitus |
| Method | 2 | Tu | Galileo and the “Scientific Method” Quiz 1 | Galileo and Apelle (1610s) (in Reeves and van Helden) pp. 59-62, 67-73, 254-257 |
| | | Th | Galileo’s Method and Boyle’s Experiments | Shapin and Schaffer Ch. 2 |
| | 3 | Tu | Newton’s Innovation and the Demise of Hypotheses | Newton (1729) <i>General Scholium</i> |
| | | Th | Du Châtelet’s Objection | DuChâtelet (1740) Ch. 4 |
| | 4 | Tu | The Atomic Hypothesis | Maddy on Perin |
| | | Th | The “Scientific Method” Today: Pseudoscience; Quiz 2 | Giancoli Ch. 1 thru §1.2 |
| Social Structure | 5 | Tu | Galileo and the Emergence of SCIENCE; Mid-quarter Surveys due | Zisel (1942) |
| | | Th | The Institutions of Science | Shapin (1989) |
| | 6 | Tu | Science in the Public Sphere SCA Trip | TBA |
| Th | | Who can be a Scientist? | Revisit Shapin, and TBA ² | |

²The reading(s) will focus on women scientists and/or indigenous systems of knowledge production—and their exclusion in especially the early modern period.

| Module | Week | Date | Topic(s) | Readings |
|---------------|------|--------|---|--|
| | 7 | Tu | Who <i>is</i> the Scientist? | Swift (1726), Part III Ch. 1 and one of Chs. 2-6 (skim the rest); you will be assigned a particular chapter to read; find-a-show |
| | | Th | Professionalization and Militarization | Turner?, Eisenhower (1961) |
| Culture | 8 | Tu | A Galilean (Paradigm) Shift | Kuhn |
| | | Th | The Crisis of Hypotheses Revisited | Revisit Newton (1729) and DuChâtelet (1740); LeSage; Garroutte |
| | 9 | Tu | Radical Changes in World-view: Organisms and Mechanisms | Milton Ch. 8 ; Newton Poetry , selections; Merchant (Death of Nature) |
| | | Th | The Evolutionary World | MMS Ch. 6 |
| | 10 | Tu | Evolution, Equal Treatment, Intelligent Design; Quiz 4 | <i>Of Pandas and People</i> , Ch. 1; Edwards v Aguillard , 578-581, 610-640 |
| | | Th | The Science Wars and STEM Culture; Quiz 3 | Chesky and Wolfmeyer (2015), Ch. 1; Comparing STEM vs STEAM |
| Final Project | 11 | [Date] | | |

10 Course Readings

There is **no required textbook** for this class! **All** readings will be made available electronically on our course website (so no need to purchase anything), which can be found [here](#)[hyperlink].

The following is a list of sources from which the course readings will be drawn, with links to external sites when possible.

Primary Sources (in order of appearance)

Heraclitus. *Homeric Problems*. Trans. Donald Russell and David Konstan. Brill: 2005.

Galileo. *On Sunspots*. Trans. Eileen Reeves and Albert Van Helden. University of Chicago Press, 2010.

Newton. “[General Scholium](#)” in *Principia* 2nd ed. 1729

DuChatelet, Emilie. *Foundations of Physics*. Trans. Bour and Zinsser. 1740.

Giancoli, . *Physics: For Scientists & Engineers*. 4th ed. Pearson Prentice Hall.

Swift, Jonathan. *Gulliver’s Travels*. 1726.

LeSage, George-Louise. “Sur la Methode D’Hypothese”. Trans. Helen Meskhidze. 1818.

Milton, John. *Paradise Lost*. 1667

Davis, Percival and Dean H. Kenyon. *Of Pandas and People: The Central Question of Biological Origins*. 2nd ed. Foundation for Thought and Ethics. 1993.

[Edwards v. Aguillard](#), 482 U.S. 578 (1987).

Secondary Sources (alphabetical)

Chesky, N.Z., Wolfmeyer, M.R. “Introduction to STEM Education.” In: *Philosophy of STEM Education: A Critical Investigation*. The Cultural and Social Foundations of Education. Palgrave Pivot, New York. 2015.

Daston, Lorraine and Peter Galison. *Objectivity*. Princeton University Press, 2007.

Maddy, Penelope. *Second Philosophy: A Naturalistic Method*. Oxford University Press. 2007.

Shapin, Steven and Simon Schaffer. *Leviathan and the Air Pump*. Princeton University Press, 1985.

Shapin, Steven. “The Invisible Technician.” *American Scientist* 77, 1989.

Zilsel, Edgar. “The Sociological Roots of Science.” *American Journal of Sociology* 47, 1942.