

History of Science 323 | History 323 (3 credits H)

The Scientific Revolution

University of Wisconsin–Madison

Spring 2021 (online)

Florence Hsia

[12:00–2:00 pm Thursday](#) & by appt. *Zoom office hours*
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course summary

This course explores renaissance and revolution in European science, beginning in 1543 with the heliocentric astronomy of Nicolaus Copernicus and ending with Isaac Newton's death in 1727. It pays particular attention to issues of tradition and novelty in natural knowledge, institutional settings for scientific activity, the multifaceted relationship between science and religion, as well as manuscript traditions and the transition to print.

Lectures cover the Copernican cosmology and Galileo's trial, experimentation, the mechanical philosophy, Newtonianism, the significance of new scientific organizations like the Royal Society of London and the Paris Academy of Sciences, the role of science in European exploration and expansion, public perceptions of science and its practitioners, science and print culture, and scientific writing and communication.

Labs focus on team-based projects that develop historical skills in analyzing unique materials from the fifteenth through the eighteenth centuries, many digitized from holdings in Special Collections (Memorial Library).

Graduate students should also enroll in History of Science 623 (for assignments, see HS623 syllabus).

outcomes

On successfully completing this course, you should be able to

- explain critical developments in how the natural world was understood in early modern Europe
- understand how early modern European science was shaped by cultural contexts
- analyze early modern European scientific books as historical objects
- interpret historical texts & objects to construct persuasive arguments concerning science & its history

modality

This is an online course. Lectures and other course components will be delivered asynchronously (no mandatory day/time) online on a weekly basis via Canvas (<https://canvas.wisc.edu/courses/234798>).

We will offer synchronous (live) options for group meetings with the instructors throughout the semester. You must sign up and attend at least 6 such synchronous group meetings over the course of the term (2 group meetings per unit). We will record 1 of the synchronous group meetings each week for viewing only by students in this class. (Please note that lecture materials and recordings are also for your personal use and [may not be copied or shared outside of this class.](#)) Sign-up sheets will be made available in the first week of the course. For any further questions about the synchronous group meetings, please contact the instructors.

This 3-credit course comprises 45 hours of course learning activities per credit. You can expect to spend an average of 9–10 hours a week on viewing lectures, completing assigned readings, participating in team-based projects, and other course assignments.

how to succeed in this course

To best manage your coursework time, use the **your week at a glance** schedules provided for each week in the Canvas course website. Some tips:

lectures

- go over the assigned **readings** before viewing **lectures**
- have the assigned **readings** to hand when viewing **lectures**
- review both the readings and lectures for the week to prepare for the **quiz**

labs

This component of the course is team-based. Weekly **lab assignments** focusing on a Book of the Week will help you and your teammates develop historical skills in analyzing unique materials from the fifteenth through the eighteenth centuries. We will introduce you to each Book of the Week. In some weeks there will also be short videos or other resources that will give you and your teammates additional context for working together on the lab assignment.

Each week, be sure to:

- complete and submit your **lab worksheet** (each person must submit their own worksheet)
- decide on rotating team roles for the **lab assignment**, for example:
 - who will serve as lab team leader and submit the lab assignment on behalf of the team)?
 - who will attend a synchronous meeting that week with the instructors?
 - who will report on any short videos or other resources for that week?
- participate early and often in the **lab discussion board** for the week so that your team can agree on a response to the lab assignment prompt

The **course introduction** module in the Canvas course website provides an overview of the course, guides to navigating Canvas, resources to support your learning, and links to important university services and policies. Please review the **course introduction** module carefully.

assessment

Grades will be based on completion of course activities as noted on the Canvas course website. Lab discussion boards are intended to help you work as a team and are not graded. There are no exams. Grades will be calculated using the following rough guidelines:

individual

- 5% viewing (weekly; completion credit)
- 20% quizzes (weekly)
- 20% lab worksheets (weekly; completion credit)
- 25% unit portfolios (3 total, 1 per unit)

lab team

- 5% group meetings with instructors (each student must sign up for and attend 6 of these meetings in total over the course of the semester, 2 per unit)
- 25% lab assignments (weekly except for when portfolios are due)

course policies

- We will make every effort to honor requests for reasonable accommodations made by individuals with disabilities. If you think you may qualify for accommodation, please contact the [McBurney Disability](#)

[Resource Center](#) at 608-263-2741 (phone), 608-225-7956 (text) to establish your eligibility for services. If you need such accommodation, please let us know as soon as possible in the semester, and by the end of the third week of the semester. All requests are confidential.

- If you need to make up course activities due to a religious observance, please let us know within the first two weeks of class. If you need to make up course activities due to other unavoidable circumstances (such as a medical problem, family emergency, or university-approved athletic trip) you should notify us—preferably in advance and as soon as possible—so that we can make arrangements.
- Academic integrity is expected of students at the University of Wisconsin-Madison in compliance with state law (UWS Chapter 14). Plagiarism and other forms of academic misconduct carry penalties. All written work that you turn in under your name should be solely your work. All sources must be acknowledged. It is your responsibility to understand what counts as academic misconduct. See the University’s [policy on academic integrity](#) and the Writing Center’s [guide to quoting and paraphrasing](#).
- The honors component is separate from your grade for the course. If you are registered for honors credit, we will contact you about the honors component after the start of the semester.

readings

All course readings are available via **Canvas** except for those in Peter **Dear**, *Revolutionizing the sciences* (second edition, Chicago, 2009). The **Dear** textbook can be purchased at the University Book Store; consulted on reserve at College Library, Helen C. White Hall; or read as an e-book through the UW–Madison Library Catalog: <https://search.library.wisc.edu/catalog/9912014063802121>.

schedule of topics & readings

unit 1: remaking traditions

week 1 (Jan 25–31) lecture lab work due Jan 31	print culture & a medieval anatomy lesson Mondino de’ Luizzi, <i>Anatomy</i> (1316/1493), illustrations navigating an early printed book Dane, “Terminology” (2012)
week 2 (Feb 1–7) lecture lab work due Feb 7	scientific renaissance: the human body Vesalius, <i>On the fabric of the human body</i> (1543), illustrations & preface Vesalius exhibits Dear , 7–9, 29–32, 36–40 images & natural history
week 3 (Feb 8–14) lecture lab work due Feb 14	natural philosophical traditions Aristotle, <i>Physics</i> Dear , 1–14 tracking traditions in print Kuhn, “Aristotelianism” (2018)
week 4 (Feb 15–21) lecture lab work due Feb 21	celestial traditions Ptolemy, <i>Almagest</i> Hellenistic astronomy Dear , 14–21 commentators & chronology Crowther & Barker, “Training the intelligent eye” (2013)

<p>week 5 (Feb 22–28)</p> <p>lecture</p> <p>lab</p> <p>work due Feb 28</p>	<p>scientific renaissance: the heavens Regiomontanus (1496) frontispiece Dear, 14–23, 32</p> <p>printers & markets Valleriani, “Prolegomena” (2017)</p>
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unit 2: moving heaven & earth

<p>week 6 (Mar 1–7)</p> <p>lecture</p> <p>lab</p> <p>work due Mar 7</p>	<p>heliocentrism Copernicus, <i>On the revolutions</i> (1543) Dear, 32–36</p> <p>unit 1 portfolio due no lab worksheet or assignment this week</p>
<p>week 7 (Mar 8–14)</p> <p>lecture</p> <p>lab</p> <p>work due Mar 14</p>	<p>responses to heliocentrism Copernicus, <i>On the revolutions of the heavenly spheres</i> (1543) Dear, 40–43, 99–101</p> <p>early modern data management Blair, “Errata lists” (2007)</p>
<p>week 8 (Mar 15–21)</p> <p>lecture</p> <p>lab</p> <p>work due Mar 21</p>	<p>(geo)heliocentrism illustrations Brahe, <i>Instruments</i> (1598/1602); <i>On the most recent phenomena</i> (1588/1610) Kepler, <i>Cosmographical mystery</i> (1596), <i>Rudolphine tables</i> (1627) Dear, 64–77, 101–107</p> <p>Galileo’s O Schmidle, “A very rare book” (2013)</p>
<p>week 9 (Mar 22–28)</p> <p>lecture</p> <p>lab</p> <p>work due Mar 28</p>	<p>starry messages image dossier: the telescopic moon Galileo, <i>Sidereal messenger</i> (1610) Castelli-Galileo letters (1613)</p> <p>the moon & the stars Dane, “Facsimiles & forgeries” (2012)</p>
<p>week 10 (Mar 29– Apr 5 Monday)</p> <p>lecture</p> <p>lab</p> <p>work due Apr 5</p>	<p>the Galileo affair Bellarmine-Foscarini letter (1615) Inquisition & Index documents (1616); Vatican letters (1631) Galileo, <i>Dialogue on the two chief world systems</i> (1632) Dear, 109–111</p> <p>depicting controversy Remmert, “In the sign of Galileo” (2003)</p>

unit 3: new worlds

<p>week 11 (Apr 5–11) lecture</p> <p>lab work due Apr 11</p>	<p>the Cartesian world Descartes, <i>Discourse on the method</i> (1637) Descartes, <i>Principles of philosophy</i> (1644/1647) Fontenelle, <i>Conversations on the plurality of worlds</i> (1686) Dear, 79–88, 93–98, 152–53 (on salons)</p> <p>unit 2 portfolio due no lab worksheet or assignment this week</p>
<p>week 12 (Apr 12–18) lecture</p> <p>lab work due Apr 18</p>	<p>the Baconian world image dossier: monsters Bacon, <i>Great instauration</i> (1620) Bacon, <i>New Atlantis</i> (1627) Dear, 55–63, 109–26</p> <p>new worlds, new genres</p>
<p>week 13 (Apr 19–25) lecture</p> <p>lab work due Apr 25</p>	<p>the Newtonian world Newton, “The system of the world” (1685) Newton, <i>Mathematical principles of natural philosophy</i> (1687) Newton, <i>Opticks</i> (1706/1717), “Query 31” Dear, 145–63</p> <p>reading an early scientific journal</p>
<p>week 14 (Apr 26–30) lecture</p> <p>lab work due Apr 30 Fri</p>	<p>experimentation Galileo, <i>Dialogue on the chief two world systems</i> (1632) Boyle, “New experiments,” <i>Philosophical transactions</i> (1668) Dear, 114–20 (review Royal Society); 127–30, 137–44</p> <p>no lab worksheet or assignment this week</p>
<p>May 7 (Friday)</p>	<p>unit 3 portfolio due</p>

Quarantine or isolation due to COVID-19

Students should continually monitor themselves for COVID-19 [symptoms](#) and get [tested](#) for the virus if they have symptoms or have been in close contact with someone with COVID-19. Students should reach out to instructors as soon as possible if they become ill or need to isolate or quarantine, in order to make alternate plans for how to proceed with the course. Students are strongly encouraged to communicate with their instructor concerning their illness and the anticipated extent of their absence from the course (either in-person or remote). The instructor will work with the student to provide alternative ways to complete the course work.