

History of Science 201 | The Origins of Scientific Thought (3 credits H)
Integrated Liberal Studies 201 | Western Culture: Science, Technology, & Philosophy (3 credits N)
 University of Wisconsin-Madison
 Fall 2020

instructor Professor Florence Hsia
 virtual office hours: Th 12:00–2:00 pm
 (email for appointment)
florence.hsia@wisc.edu

teaching assistants
Hist Sci James Barnes (james.barnes@wisc.edu)
ILS Sara Paris (sparis2@wisc.edu)
ILS Patrick Walsh (pwalsh3@wisc.edu)

course summary

What does science have to do with religion? What does it mean to have expertise about the natural world? And what difference do politics and funding sources make to scientific investigation? Learn how to think critically and historically about science in this course by exploring such fundamental questions across two millennia. We begin with ancient mythology and philosophy, then follow the movement of natural philosophical traditions into medieval Islam and Christendom, and finally turn to the ‘revolution’ in science of the 16th and 17th centuries with Copernicus, Galileo, Descartes, and Newton. These historical investigations provide vital insights into ideas of the ‘natural’, scientific observation, and experiment, as well as into our expectations of scientific knowledge and the scientific enterprise.

outcomes

On successfully completing this course, you should be able to:

- explain critical developments in how the natural world has been analyzed and understood
- recognize how science and its history have served a wide range of purposes
- understand how science has been deeply shaped by its historical and cultural contexts
- interpret historical sources to construct persuasive arguments concerning science and its history

modality

This is a blended 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/208287>). Some sections will be held online and others face-to-face. Your TA will provide specific information about discussion section activities and office hours.

You can expect to work on course learning activities for about 2 hours outside of class for every credit hour. Plan to give an average of 9 hours per week to viewing lecture videos, reading, preparing for and participating in discussions, and completing assignments for this course.

To best manage your coursework time, please review the **Your Week at a Glance** schedule of readings and activities provided in the guides for the Course Intro and each week in the Canvas course website. Be sure to have access to the assigned readings when viewing the lecture videos and participating in discussion section activities.

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.

For **in-person classes**: instructors may halt the class and, if necessary, leave the classroom if anyone in the room is not wearing a properly fitted mask. To best support your own learning and that of your classmates, please wear your mask properly, use the supplies provided to clean your desk, and observe 6-foot physical distancing as well as other university guidelines (<https://smartrestart.wisc.edu/badgerpledge/>). For details on in-person guidelines, see the end of this syllabus.

assessment

Grades will be based on completion of course activities as noted on the Canvas course website.

Grades will be calculated using the following rough guidelines:

lecture video quizzes (weekly; completion credit)	5%
content quizzes (weekly)	15%
midweek inventories (weekly; completion credit)	25%
portfolio activities (weekly)	25%
portfolio capstones (three total, one per unit; 10% each)	30%

COURSE POLICIES

- I will make every effort to honor requests for reasonable instructional accommodations made by persons with disabilities. If you think you may qualify for accommodation, please contact the McBurney Disability Resource Center at 263-2741 (phone), 225-7956 (text), or <http://mcburney.wisc.edu/students/howto.php> to establish your eligibility for services. If you need such accommodation, please let me 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 your TA 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 me and your TA—preferably in advance—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. The University's policy is outlined here: <https://conduct.students.wisc.edu/academic-integrity/>. See the Writing Center's guide to quotations: <http://writing.wisc.edu/Handbook/QuotingSources.html>.
- If you are taking either Hist Sci 201 or ILS 201 for honors credit, the honors component will be separate from your grade for the course. If you are registered for honors credit, I will contact you about the honors component after the start of the semester.

readings

All course readings, videos, and activities are available via the Canvas course website except for assignments in the following textbooks, which may be purchased at the University Book Store.

- David C. **Lindberg**, *The beginnings of Western science* (University of Chicago Press, **2007** edition)
- Peter **Dear**, *Revolutionizing the sciences* (Princeton University Press, **2009** edition)

The Dear textbook can also be read as an e-book through the UW–Madison Library Catalog:

<https://search.library.wisc.edu/catalog/9912014063802121>.

SCHEDULE OF READINGS
Unit 1: Scientific Traditions

week 1 **objectives, questions, sources**
 Sept 2 (W) Roughton, "An essay in story form" (2017); LBAT 1591 tablet
 Lindberg, 1–20, 82–86

week 2 **Homeric/Milesian worldviews; Greek medicine**
 Sept 7 (M) Homer, *Odyssey*; Milesian fragments
 healing cults; "The sacred disease"
 Lindberg, 21–29, 111–19
Troy (2004) scene

week 3 **Eleatics, pluralists, and atomists; the Platonic world**
 Sept 14 (M) Zeno's paradox; atomist fragments
 Plato, *Republic* and *Timaeus*
 Lindberg, 29–44
The Matrix (1999) scenes

week 4 **the Aristotelian world**
 Sept 21 Aristotle, *Physics*
 Lindberg, 45–66

week 5 **the Hellenistic world**
 Sept 28 Ptolemy, *Almagest*
 Lindberg, 86–105, 132–36
 animations

Unit 2: Renaissance & Revolution

week 6 **natural knowledge in translation**
 Oct 5 Anselm, Abelard, & Bernard of Clairvaux
 Aristotle in Paris documents
 Lindberg, 146–81, 193–234, 243–53

week 7 **scientific renaissance: medicine**
 Oct 12 Mondino de' Luizzi, *Anatomy* (1316/1493), illustrations
 Vesalius, *On the fabric of the human body* (1543), illustrations
 Vesalius, *On the fabric of the human body* (1543), preface
 Lindberg, 119–31
 Dear, 7–9, 29–32, 36–40

week 8 **scientific renaissance: astronomy/cosmology**
 Oct 19 Sacrobosco (1482), Peurbach (c. 1474), Regiomontanus (1496) illustrations
 Copernicus, *On the revolutions of the heavenly spheres* (1543)
 Brahe, *Instruments* (1598/1602); *On the most recent phenomena* (1588/1610)
 Lindberg, 261–70
 Dear, 10–23, 32–36, 40–43, 99–101

week 9 heliocentrism
 Oct 26 Kepler, *Cosmographical mystery* (1596), *Rudolphine tables* (1627) illustrations
 image dossier: the telescopic moon
 Galileo, *Sidereal messenger* (1610)
 Dear, 64–77, 101–106

week 10 the Galileo affair
 Nov 2 Castelli-Galileo letters (1613)
 Bellarmine-Foscarini letters (1615); Inquisition & Index documents (1616)
 Vatican letters (1631); Galileo, *Dialogue on the two chief world systems* (1632)

Unit 3: New Worlds

week 11 the Cartesian world
 Nov 9 Descartes, *Discourse on the method* (1637)
 Descartes, *Principles of philosophy* (1644/1647)
 Fontenelle, *Conversations on the plurality of worlds* (1686)
 Dear, 79–88, 93–98, 152–53 (on salons)

week 12 Baconian reform
 Nov 16 image dossier: monsters
 Bacon, *Great instauration* (1620)
 Bacon, *New Atlantis* (1627)
 Dear, 55–63, 109–20

week 13 scientific journals
 Nov 23 *Philosophical transactions* 1 (1665): 1–16 & Oldenburg, “To the Royal Society”
Philosophical transactions exercise
 Dear, 114–20 (Royal Society – review)
 Nov 26 (Th) Thanksgiving

week 14 the Newtonian world
 Nov 30 Newton, “The system of the world” (1685)
 Newton, *Mathematical principles of natural philosophy* (1687)
 Newton, *Opticks* (1706/1717), “Query 31”
 Dear, 145–63

week 15 experimentation
 Dec 7 Galileo, *Dialogue on the chief two world systems* (1632)
 Boyle, “New experiments,” *Philosophical transactions* (1668)
 Baker, “1,500 scientists,” *Nature* 533 (25 May 2016)
 Dear, 127–30, 137–44

Face Coverings During In-person Instruction Statement (COVID-19)

Individuals are expected to wear a face covering while inside any university building. Face coverings must be [worn correctly](#) (i.e., covering both your mouth and nose) in the building if you are attending class in person. If any student is unable to wear a face-covering, an accommodation may be provided due to disability, medical condition, or other legitimate reason.

Students with disabilities or medical conditions who are unable to wear a face covering should contact the [McBurney Disability Resource Center](#) or their Access Consultant if they are already affiliated.

Students requesting an accommodation unrelated to disability or medical condition should contact the Dean of Students Office.

Students who choose not to wear a face covering may not attend in-person classes, unless they are approved for an accommodation or exemption. All other students not wearing a face covering will be asked to put one on or leave the classroom. Students who refuse to wear face coverings appropriately or adhere to other stated requirements will be reported to the [Office of Student Conduct and Community Standards](#) and will not be allowed to return to the classroom until they agree to comply with the face covering policy. An instructor may cancel or suspend a course in-person meeting if a person is in the classroom without an approved face covering in position over their nose and mouth and refuses to immediately comply.

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.