

HURON UNIVERSITY COLLEGE
Undergraduate Course Outline 2022–2023

HistSci2200E: The History of Scientific Thought

Tues 1:30–2:30, Thurs 12:30–2:30
Classroom: W8 (Huron)
Office: Lucas House Annex

Instructor: Emerson Doyle
email: edoyle9@uwo.ca
Hours: Wed 1:00–3:30 or anytime via Zoom

Course Description

This course is a survey of the physical and biological sciences from pre-history to the 20th century. Our focus will be an understanding of the landmark theories in these sciences as informing issues in the foundations and philosophy of science. We will engage questions of scientific methodology, the sources/reliability of scientific knowledge, the prevalence of various goals for, and attitudes toward, science, and the relationships between science, religion, culture, society, and the individual.

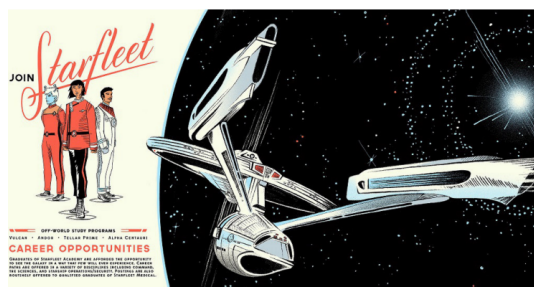
Anti-Requisite(s): Phil2203E.

Western Foot Patrol: 519-661-3650

Course Objectives & Methods

Fundamentally this is a course about the history of ideas—specifically the development of *Scientific Methods*. Students should finish the course with an understanding of what science is, its methods, and why it was and continues to be so important to the development of civilization. Students should also gain an understanding of multiple scientific theories, both historical and contemporary, and acquire an appreciation for why scientific methods continue to be so useful. Successful students will improve their writing and general communication skills, especially with regard to writing from various perspectives and evaluating arguments and ideas in their relevant contexts.

We will take a multifaceted approach to the material so as to benefit as many learning styles as possible. Besides typical lectures, we will engage in discussion (both in class and online), group work and peer-editing, watch videos, and perform simple experiments to reinforce key concepts. There will be a large number of web links posted to encourage self-discovery, and each week I will post a set of “Questions for Thought” that further reinforce and review the material. *I encourage you to see me with any questions or to recommend alternate approaches; while I will do my best to encourage a safe and positive atmosphere in the classroom.* In my experience this course is the most fun and beneficial when everyone is engaged and feels comfortable offering contributions.



Texts

- Lindberg, David C. (2007) *The Beginnings of Western Science, 2nd Ed.* UC Press.
- Various individual readings to be made available on OWL.

A meat-space version of the text is available at the Western Bookstore. An e-book is available from the University of Chicago Press website. I'll also place a copy on reserve at the Huron Library.

Requirements

Fall Semester

- Active Learning: 10% (in-class activities, group work, and short assignments)
- Guided Essay: 10% (4 pages maximum, several due-dates)
- Essay the Second: 10% (6 pages maximum, several due-dates)
- Mid-Year Exam: 15% (during the Fall 2022 exam period)

Winter Semester

- Active Learning: 10% (in-class activities, group work, and short assignments)
- Research Essay: 30% (10 pages maximum, several due-dates)
- Final Exam: 15% (during the Winter 2023 exam period)

Active Learning will include group discussions/activities during class, take-home assignments, and contributions to Forum discussions. Something will be offered most weeks—you must complete to a high quality 10 such activities per semester to get full points.

The **Guided Essay** and **Essay the Second** are both multi-part, designed to develop and reinforce the essentials of academic writing. Topics will be distributed in advance. Late work without arrangement with me **in advance** will be penalized **5% per day late**, including weekends.

The **Research Essay** will be a more substantial argumentative paper. Students are expected to develop their own research question in consultation with me, and to engage in independent research outside the bounds of course material. Again, multi-part: Question/Meetings/Peer Editing/Final.

Exams will occur during the appropriate exam periods. These will be “take-home” style assignments requiring a demonstration of understanding and a significant synthesis of course content.



Schedule

*Please be advised that the reading list is tentative.

Fall Term

- Week 1 (Sept 08) **Introductory Week: Just What are We Talking About?**
- Okasha, “What is Science?” (on OWL)
 - McGrew, “The Ancient & Medieval Periods” (on OWL)
- Week 2 (Sept 13/15) **In the Beginning: Prehistory & Pre-Socratic Thought**
- Lindberg, Chp. 1 “Science Before the Greeks” (pp. 1–12)
 - Lindberg, Chp. 2 “The Greeks and the Cosmos” (pp. 21–34)
- Week 3 (Sept 20/22) **Plato’s Heaven & The Mathemagical World of Euclid**
- Jourdain, selection from *The Nature of Mathematics* (on OWL)
 - Lindberg, Chp. 5 “The Mathematical Sciences. . .” (pp. 82–86)
 - Lindberg, Chp. 2 “The Greeks and the Cosmos” (pp. 34–44)
 - Plato, “Plato’s Cosmology” (on OWL)
- Week 4 (Sept 27/29) **Up, Up, and Away! Early Astronomy**
- Lindberg, Chp. 1 “Science Before the Greeks” (pp. 12–17)
 - Lindberg, Chp. 5 “The Mathematical Sciences. . .” (pp. 86–95)
 - Aristotle, “The Structure and Motion of the Heavenly Spheres” (on OWL)
- Week 5 (Oct 04/06) **You’re Going to do WHAT to Me!?! Early Medicine**
- Lindberg, Chp. 1 “Science Before the Greeks” (pp. 18–20)
 - Lindberg, Chp. 6 “Greek and Roman Medicine”
 - Celsus, selections from *De Medicina* (on OWL)
- Week 6 (Oct 11/13) **Of Aristotles & Atoms**
- Lindberg, Chp. 3 “Aristotle’s Philosophy of Nature”
 - Aristotle, “Change, Natures, and Causes” (on OWL, ignore pars. 4–7)
 - Lucretius, “The Explanatory Power of Atomism” (on OWL)
- Guided Essay due October 13th — 10%**
- Week 7 (Oct 18/20) **Early Medieval Science—Reading More Than Just the Bible(s)**
- Lindberg, Chp. 7 “Roman and Early Medieval Science”
 - Pliny the Elder, selections from *The Natural History* (on OWL)
- Week 8 (Oct 25/27) **Medieval Medicine, Historiography, and Interpretation**
- Green, “In Search of an ‘Authentic’ Women’s Medicine” (on OWL)
 - Lindberg, Chp. 13 “Medieval Medicine. . .” (pp. 321–348)
- Essay Review Assignment due Friday October 29th**
- Week ☹ (Nov 01/03) **Reading Week! (Whew!)**

Week 10 (Nov 08/10)

Ptolemaic Astronomy—Teach the Controversy

- Lindberg, Chp. 5 “The Mathematical Sciences...” (pp. 95–105)
- Okasha, “Realism and Anti-Realism” (on OWL)
- Ptolemy, “The Earth: It’s Size, Shape, and Immobility” (on OWL)
- Maimonides, “Against the Reality of Epicycles and Eccentrics” (on OWL)

Week 11 (Nov 15/17)

West Meets East: Islamic Science

- Lindberg, Chp. 8 “Islamic Science”
- Ibn Sina, selections from *Concerning the Soul* (on OWL)
- Ibn Rushd, selections from *On Islam and Philosophy* (on OWL)

Essay the Second Outline due Friday November 19th

Week 12 (Nov 22/24)

“New” (ha!) Knowledge & Christianity in Europe

- Lindberg, Chp. 9 “The Revival of Learning in the West”
- Henry, “The Western Middle Ages” (on OWL)

Week 13 (Nov 29/Dec 01) **A Synthesis in Scholasticism**

Full-Year Course

Drop Week

- Lindberg, Chp. 10 “The Recovery and Assimilation...”
- R. Bacon, selections from *Opus Maius* (on OWL)
- Oresme, “The Possibility of a Rotating Earth” (on OWL)

Week 14 (Dec 06/08)

Motion from God? Of Religion & Revolutions

- Lindberg, Chp. 12 “The Physics of the Sublunar...” (pp. 295–309)
- Philoponus, “Projectile Motion” (on OWL)
- Philoponus, “Free Fall” (on OWL)
- Buridan, “Impetus and its Applications” (on OWL)

Essay the Second due December 08th — 10%

Mid-Year Exam during Fall Exam Period — 15%



Winter Term

*Reading list is still tentative.

Week 15 (Jan 10/12)

The All-New Astronomy! (And Again, & Again...)

- Osiander, “The Unsigned Letter” (on OWL)
- Brahe, “The New Star” (on OWL)
- Kepler, “Eight Minutes of Arc” (on OWL)

Week 16 (Jan 17/19)

Empiricism v Rationalism II: Rumble in the Renaissance

- F. Bacon, “The Inductive Method” (on OWL)
- Descartes, “Rationalism and Scientific Method” (on OWL)
- Gribbin, “Renaissance Men” & “Science Finds its Feet” (on OWL)

Week 17 (Jan 24/26)

Just Look at It! New Instruments & The Galileo Controversy

- Galileo, “A Moving Earth is More Probable...” (on OWL)
- Galileo, “The Ship and the Tower” (on OWL)
- Galileo, “The Copernican View Vindicated” (on OWL)

Week 18 (Jan 31/Feb 02)

Newton’s Solution to the ‘Chief World Systems’—Derivative?

- Newton, “Four Rules of Reasoning” (on OWL)
- Newton, “General Scholium” (on OWL)
- Newton, “The System of the World” (on OWL)

Research Question due February 02nd — 5%

Week 19 (Feb 07/09)

Alchemy & The All-New Chemistry! (A Little Late...)

- Lindberg, Chp. 12 “The Physics of the Sublunar...” (pp. 286–295)
- Boyle, “The ‘Corpuscular’ Philosophy” (on OWL)
- *Skim*: Gribbin, “Chemistry Catches Up” (on OWL)

Week 21 (Feb 14/16)

Religion and Science: Together at Last?

- Lindberg, Chp. 11 “Astrology” (pp. 270–277)
- Broad, “Cavendish & Glanvill: Science, Religion, & Witchcraft” (on OWL)
- Ben-Yehuda, “The European Witch Craze...” (first & last sections, on OWL)

Week ☹ (Feb 21/23)

No Class — Reading Week!! (whew!)

Week 23 (Feb 28/Mar 02)

Phlogiston! Phlogiston Everywhere! (Or is it Oxygen?)

- *Finish*: Gribbin, “Chemistry Catches Up” (on OWL)
- Lavoisier, “The Nature of Scientific Explanation” (on OWL)
- Smeaton, “Monsieur & Madame Lavoisier in 1789” (on OWL)

Week 24 (Mar 07/09)

The Return of the Invisible (and Indivisible!) Atoms

- Gribbin, “Atoms and Molecules” (on OWL)
- Maxwell, “The Ontological Status of Theoretical Entities” (on OWL)

Research Essay Draft due March 09th

Week 25 (Mar 14/16)

Cause & Effect—Steam, Coal, and Electricity Seem to Work!

- Okasha, “Scientific Inference” (on OWL pp. 16–30)
- Bowler & Morus, “The Conservation of Energy” (on OWL)
- Hume, “The Nature of Cause and Effect” (on OWL)

Week 26 (Mar 21/23)

Seriously Folks, We’re Animals—The Darwinian Revolution

- Bowler & Morus, “The Darwinian Revolution” (on OWL)
- Okasha, “What are Biological Species?” (on OWL pp. 96–104)
- Darwin, “The Explanatory Scope of the Evolutionary Hypothesis” (on OWL)

Peer Editing due March 23rd — 5%

Week 27 (Mar 28/30)

Germ, eh... So You’re Saying I Should Wash My Hands?

- Okasha, “Science and its Critics” (on OWL)
- Manger, selections from *A History of Infectious Diseases...* (on OWL)

Week 28 (Apr 04/06)

Back to The Continuity Question

- Okasha, “Scientific Change and Scientific Revolutions” (on OWL)
- Lindberg, Chp. 14 “The Legacy of Ancient & Medieval Science”

Research Essay Final due April 06th — 20%

Final Exam during Winter Exam Period — 15%

SCIENCE
Ruining Everything Since 1543



Appendix to Course Outlines: Academic Policies & Regulations Fall/Winter 2022

Pandemic Contingency

Huron will continue to follow the guidance of public health and government officials. It is anticipated that there will be no further disruptions to in-person instruction. This is subject to change.

Student Code of Conduct

Membership in the community of Huron University College and Western University implies acceptance by every student of the principle of respect for the rights, responsibilities, dignity and well-being of others and a readiness to support an environment conducive to the intellectual and personal growth of all who study, work and live within it. Upon registration, students assume the responsibilities that such registration entails. While in the physical or online classroom, students are expected to behave in a manner that supports the learning environment of others. Please review the Student Code of Conduct at: <https://huronatwestern.ca/sites/default/files/Res%20Life/Student%20Code%20of%20Conduct%20-%20Revised%20September%202019.pdf>.

Prerequisite and Antirequisite Information

Students are responsible for ensuring that they have successfully completed all course prerequisites and that they have not completed any course antirequisites. Unless you have either the requisites for this course or written special permission from your Dean to enroll in it, you may be removed from this course and it will be deleted from your record. This decision may not be appealed. You will receive no adjustment to your fees in the event that you are dropped from a course for failing to have the necessary prerequisites.

Attendance Regulations for Examinations

A student is entitled to be examined in courses in which registration is maintained, subject to the following limitations:

- 1) A student may be debarred from writing the final examination for failure to maintain satisfactory academic standing throughout the year.
- 2) Any student who, in the opinion of the instructor, is absent too frequently from class or laboratory periods in any course will be reported to the Dean of the Faculty offering the course (after due warning has been given). On the recommendation of the Department concerned, and with the permission of the Dean of that Faculty, the student will be debarred from taking the regular examination in the course. The Dean of the Faculty offering the course will communicate that decision to the Dean of the Faculty of registration.

Review the policy on Attendance Regulations for Examinations here: [Academic Calendar - Western University \(uwo.ca\)](https://www.uwo.ca/academic_calendar/)

Statement on Academic Offences

Scholastic offences are taken seriously and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, at the following website: [Academic](#)

[Calendar - Western University \(uwo.ca\)](#) .The appeals process is also outlined in this policy as well as more generally at the following website:

https://www.uwo.ca/univsec/pdf/academic_policies/appeals/appealsundergrad.pdf.

Turnitin.com

All required papers may be subject to submission for textual similarity review to the commercial plagiarism detection software under license to the University for the detection of plagiarism. All papers submitted for such checking will be included as source documents in the reference database for the purpose of detecting plagiarism of papers subsequently submitted to the system. Use of the service is subject to the licensing agreement, currently between The University of Western Ontario and Turnitin.com (<http://www.turnitin.com>).

Statement on Use of Electronic Devices

It is not appropriate to use electronic devices (such as, but not limited to, laptops, tablets, cell phones) in the classroom for non-classroom activities. Such activity is disruptive and distracting to other students and to the instructor, and can inhibit learning. Students are expected to respect the classroom environment and to refrain from inappropriate use of technology and other electronic devices in class.

Statement on Use of Personal Response Systems (“Clickers”)

Personal Response Systems (“clickers”) may be used in some classes. If clickers are to be used in a class, it is the responsibility of the student to ensure that the device is activated and functional. Students must see their instructor if they have any concerns about whether the clicker is malfunctioning. Students must use only their own clicker. If clicker records are used to compute a portion of the course grade:

- the use of somebody else’s clicker in class constitutes a scholastic offence
- the possession of a clicker belonging to another student will be interpreted as an attempt to commit a scholastic offence.

Academic Consideration for Missed Work

All students pursuing academic consideration, regardless of type, must contact their instructors no less than 24 hours following the end of the period of absence to clarify how they will be expected to fulfill the academic responsibilities missed during their absence. **Students are reminded that they should consider carefully the implications of postponing tests or midterm exams or delaying submission of work, and are encouraged to make appropriate decisions based on their specific circumstances.**

Students who have conditions for which academic accommodation is appropriate, such as disabilities or ongoing or chronic health conditions, should work with Accessible Education Services to determine appropriate forms of accommodation. Further details concerning policies and procedures may be found at: <http://academicsupport.uwo.ca/>.

Policy on Academic Consideration for a Medical/ Non-Medical Absence

- (a) **Consideration on Medical Grounds for assignments worth *less than 10%* of final grade:
Consult Instructor Directly and Contact Academic Advising**

When seeking consideration on **medical grounds** for assignments worth *less than 10%* of the final course grade, the student should contact the instructor directly. The student need only share broad outlines of the medical situation. The instructor **may** require the student to submit documentation to the academic advisors, in which case she or he will advise the student and inform the academic advisors to expect documentation. If documentation is requested, the student will need to complete and submit the [Student Medical Certificate](#). The instructor may not collect medical documentation. The advisors will contact the instructor when the medical documentation is received, and will outline the severity and duration of the medical challenge as expressed on the Student Medical Certificate and in any other supporting documentation. The student will be informed that the instructor has been notified of the presence of medical documentation, and will be instructed to work as quickly as possible with the instructor on an agreement for accommodation.

b) Medical Grounds for assignments worth 10% or more of final grade: Go Directly to Academic Advising

University Senate policy, which can be found at [Academic Calendar - Western University \(uwo.ca\)](#) requires that all student requests for accommodation on medical grounds for assignments worth 10% or more of the final grade be made directly to the academic advising office of the home faculty (for Huron students, the “home faculty” is Huron), with supporting documentation in the form (minimally) of the Senate-approved Student Medical Certificate found at:

https://www.uwo.ca/univsec/pdf/academic_policies/appeals/medicalform.pdf.

The documentation is submitted in confidence and will not be shown to instructors. The advisors will contact the instructor when the medical documentation is received, and will outline the severity and duration of the medical challenge as expressed on the Student Medical Certificate and in any other supporting documentation. The student will be informed that the instructor has been notified of the presence of medical documentation, and will be instructed to work as quickly as possible with the instructor on an agreement for accommodation. The instructor will not normally deny accommodation where appropriate medical documentation is in place and where the duration it describes aligns with the due date(s) of assignment(s). Before denying a request for accommodation on medical grounds, the instructor will consult with the Dean. The instructor’s decision is appealable to the Dean.

c) Consideration on Non-Medical Grounds: Consult Huron Support Services/Academic Advising, or email huronsss@uwo.ca.

Students seeking academic consideration for a **non-medical** absence (e.g. varsity sports, religious, compassionate, or bereavement) will be required to provide appropriate documentation. All consideration requests must include a completed [Consideration Request Form](#). Late penalties may apply at the discretion of the instructor.

Please review the full policy on Academic Consideration for medical and non-medical absence at: [accommodation medical.pdf \(uwo.ca\)](#). Consult [Huron Academic Advising](#) at huronsss@uwo.ca for any further questions or information.

Support Services

For advice on course selections, degree requirements, and for assistance with requests for medical accommodation, students should email an Academic Advisor in Huron’s Student Support Services at

huronsss@uwo.ca. An outline of the range of services offered is found on the Huron website at: <https://huronatwestern.ca/student-life/student-services/>.

Department Chairs, Program Directors and Coordinators are also able to answer questions about individual programs. Contact information can be found on the Huron website at: <https://huronatwestern.ca/contact/faculty-staff-directory/>.

If you think that you are too far behind to catch up or that your workload is not manageable, you should consult your Academic Advisor. If you are considering reducing your workload by dropping one or more courses, this must be done by the appropriate deadlines. Please refer to the Advising website, <https://huronatwestern.ca/student-life/student-services/academic-advising/> or review the list of official Sessional Dates on the Academic Calendar, available here: <http://www.westerncalendar.uwo.ca/SessionalDates.cfm>.

You should consult with the course instructor and the Academic Advisor who can help you consider alternatives to dropping one or more courses. Note that dropping a course may affect OSAP and/or Scholarship/Bursary eligibility.

Huron Student Support Services: <https://huronatwestern.ca/student-life/student-services/>
 Office of the Registrar: <https://registrar.uwo.ca/>
 Student Quick Reference Guide: <https://huronatwestern.ca/student-life/student-services/#1>
 Academic Support & Engagement: <http://academicsupport.uwo.ca/>
 Huron University College Student Council: <https://huronatwestern.ca/student-life/beyond-classroom/hucsc/>
 Western USC: <http://westernusc.ca/your-services/#studentservices>

Wellness and Health Supports at Huron and Western

University students may encounter setbacks from time to time that can impact academic performance. Huron offers a variety of services that are here to support your success and wellbeing. All Huron staff and faculty have received training on responding to disclosures of Gender-Based Sexual Violence (GBSV); students should know that the Community Safety Office is a resource for survivors, providing support and, if desired, guidance while referring them to the further supports that they may require. Please visit <https://huronatwestern.ca/student-life-campus/student-services/wellness-safety> for more information or contact staff directly:

Wellness Services: huronwellness@huron.uwo.ca
 Community Safety Office: safety@huron.uwo.ca
 Additional supports for Health and Wellness may be found and accessed at Western through, <https://www.uwo.ca/health/>.

Western Calendar - Policy Pages -

[Academic Calendar - Western University \(uwo.ca\)](#)