

HURON UNIVERSITY COLLEGE
Undergraduate Course Outline 2011–2012

**History of Science 2200E: The History of
Scientific Thought**

Fall/Winter Term 2011–2012
T 2:30–3:30, Th 3:30–5:30
HC-V214 (Huron College)

Instructor: Emerson Doyle
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Office Hours: T 3:30–5:00 (HC-A13)

Description

This course will provide a survey of the physical and biological sciences from pre-history to the twentieth century. Our focus will be on how an understanding of the landmark theories in these sciences can inform questions and problems in the foundations and philosophy of science. In this regard, we will tackle questions about scientific methodology, the sources of scientific knowledge, and the relations between science, philosophy, mathematics, religion, and society.

In the Fall Semester, we will begin by examining the definition of ‘science’ and means of modelling various aspects of the scientific method. We will then cover major theories in the history of science from pre-history to roughly 1450CE. The Winter Semester will focus primarily around the Copernican, Newtonian, and Darwinian revolutions. We will also touch briefly on contemporary scientific theories such as modern genetics, special and general relativity, and quantum mechanics. Finally, we will bring the course full-circle by utilizing these case-studies in the history of science to derive lessons about the scientific method generally.

Texts

- Lindberg, David C. *The Beginnings of Western Science, 2nd Edition*. Chicago: The University of Chicago Press, 2007.
- Bowler, Peter J. and Morus, I. R. *Making Modern Science: A Historical Survey*. Chicago: The University of Chicago Press, 2005.
- Various supplemental readings to be made available on WebCT.

Both books should be available at the UWO Bookstore and from Amazon.ca. I will also place copies of the books on reserve at the Huron Library.

Requirements

Fall Semester

- 10% Just the Facts Paper (2–3 pages, due **before** the last week of the semester)
- 10% First Paper (3–4 pages, due October 13)
- 15% Mid-Semester Test (in class, on November 10)
- 15% Second Paper (5–7 pages, due December 6)

Winter Semester

- 10% Third Paper (3–4 pages, date TBA)
- 15% Mid-Semester Test (date TBA)
- 25% Final Paper (6–8 pages, due April 10)

Paper topics will be distributed in advance. Students may devise their own topic provided the topic is approved by me. **Late papers** will be penalized by **3% per day** late, including weekends up to a maximum of 50%.

The **Mid-Semester Tests** will be written in class on the specified date. If you cannot make it to class on the day of the test, please see me **well in advance** so we can schedule a make-up date.

The **Just the Facts Paper** can be handed in at any time **prior to the last week of class**. The idea is to jump into the shoes of an ancient or medieval scientist. The 2–3 page paper should be a defence of a particular scientific theory from the point of view of a scientist during that time. After explaining the theory, you will have to bring up possible criticisms of it and deflect them using only the information known to people when the theory was held.

Objectives

This is fundamentally a course in the history of ideas, specifically the development of the scientific method. Students should come away from the course with a better understanding and appreciation of what science is, how it works, and why it has been so important to the development of our society and culture. Along with this, students should gain or improve their understanding of a large number of scientific theories, both historical and contemporary, as well as gaining an appreciation for why the scientific method continues to be so important today. Finally, students will improve their writing and general communications skills, especially as regards being able to write from various perspectives and evaluate arguments and ideas in their relevant contexts.

Schedule

*Please be advised that the reading list is tentative.

Fall Semester

Part 1: What is Science? What is Philosophy of Science?

- Sept. 8 – No assigned readings.
- Sept. 13 – Jourdain, P.E.B. selections from *The Nature of Mathematics*
– Lindberg, Chapter 1, “Science Before the Greeks”

Part 2: Ancient Science, Mathematics, and Medicine

- Sept. 15 – Lindberg, Chapter 2, “The Greeks and the Cosmos”
- Sept. 20, Sept. 22 – Lindberg, Chapter 3, “Aristotle’s Philosophy of Nature”
– Aristotle, selections from *Metaphysics*
- Sept. 28, Sept. 29 – Lindberg, Chapter 4, “Hellenistic Natural Philosophy”
- Oct. 4, Oct. 6 – Lindberg, Chapter 5, “The Mathematical Sciences in Antiquity”
– Jourdain, P.E.B. selections from *The Nature of Mathematics*
- Oct. 11, Oct. 13 – Lindberg, Chapter 6, “Greek and Roman Medicine”

First Paper Due on Oct. 13

- Oct. 18, Oct. 20 – Lindberg, Chapter 7, “Roman and Early Medieval Science”

Part 3: Islam, Christianity, and Their Influence

- Oct. 25, Oct. 27 – Lindberg, Chapter 8, “Islamic Science”
– Ibn Sīnā, selections from *Concerning the Soul*
- Nov. 1, Nov. 3 – Lindberg, Chapter 9, “The Revival of Learning in the West”
- Nov. 8, Nov. 10 – Lindberg, Chapter 10, “The Recovery and Assimilation of Greek and Islamic Science”

Mid-Term Test on Nov. 10

Part 4: Medieval Science and Medicine

- Nov. 15, Nov. 17 – Lindberg, Chapter 11, “The Medieval Cosmos”
 – Bacon, Roger, selections from *The Opus Majus*
- Nov. 22, Nov. 24 – Lindberg, Chapter 12, “The Physics of the Sublunar Region”
- Nov. 29, Dec. 1 – Lindberg, Chapter 13, “Medieval Medicine and Natural History”
- Dec. 6 – Lindberg, Chapter 14, “The Legacy of Ancient and Medieval Science”

Second Paper Due on Dec. 6

Appendix to Course Outlines

Prerequisite Information

Students are responsible for ensuring that they have successfully completed all course prerequisites. Unless you have either the requisites for this course or written special permission from your Dean to enrol 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.

Conduct of Students in Classes, Lectures, and Seminars

Membership in the community of Huron University College and the University of Western Ontario 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. The academic and social privileges granted to each student are conditional upon the fulfillment of these responsibilities.

In the classroom, students are expected to behave in a manner that supports the learning environment of others. Students can avoid any unnecessary disruption of the class by arriving in sufficient time to be seated and ready for the start of the class, by remaining silent while the professor is speaking or another student has the floor, and by taking care of personal needs prior to the start of class. If a student is late, or knows that he/she will have to leave class early, be courteous: sit in an aisle seat and enter and leave quietly.

Please see the *Code of Student Rights and Responsibilities* at:

http://www.huronuc.ca/students/student_life/student_policies

Technology

It is not appropriate to use technology (such as, but not limited to, laptops, PDAs, cell phones) in the classroom for non-classroom activities. Such activity is disruptive and is 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.

Academic Accommodation for Medical/Non-Medical Grounds

For UWO Policy on Accommodation for Medical Illness and a downloadable SMC see:

http://www.uwo.ca/univsec/handbook/appeals/accommodation_medical.pdf

[downloadable Student Medical Certificate (SMC): <https://studentservices.uwo.ca> under the Medical Documentation heading]

Students seeking academic accommodation on medical grounds for any missed tests, exams, participation components and/or assignments worth 10% or more of their final grade must apply to the Academic Counselling office of their home Faculty and provide documentation.

Academic accommodation will be determined by the Dean's Office in consultation with the instructor.

For non-medical grounds or for medical grounds when work represents less than 10% of the overall grade for the course, the student must submit a request to the instructor in writing prior to the due date of an assignment, and immediately in the case of a test. (Or as soon as possible following a medical emergency) Students are protected under the Official Student Record Information Privacy Policy and so written requests need only include a broad and general explanation of the situation, and the approximate length of time required. At the discretion of the instructor, the granting of extensions and re-scheduled tests may require the student to submit supporting either medical or non-medical documentation to the Academic Counsellor, who will then make the determination as to whether accommodation is warranted.

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 Web site: http://www.uwo.ca/univsec/handbook/appeals/scholastic_discipline_undergrad.pdf .

Plagiarism

Plagiarism is an academic offence and will be treated as such. Students who are in doubt as to the nature of this offence should consult their instructor, Department Chair or the Dean, as well as the Huron University College Statement on Plagiarism, available at the reference desk in the HUC Library and at <http://www.huronuc.ca/library/Citing/>. In addition, students may seek guidance from a variety of current style manuals available at the Reference Desk in the HUC Library. Information about these resources can be found in LibGuides on the main page: <http://www.huronuc.ca/library>.

Students found guilty of plagiarism will suffer consequences ranging from a grade reduction to failure in the course to expulsion from the university. In addition, a formal letter documenting the offence will be filed in the Dean's Office, and this record of the offence will be retained in the Dean's Office for the duration of the student's academic career at Huron University College.

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.

Computer-marked multiple-choice tests and/or exams may be subject to submission for

similarity review by software that will check for unusual coincidences in answer patterns that may indicate cheating.

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.

Policy on Special Needs

Students who require special accommodation for tests and/or other course components must make the appropriate arrangements with the Student Development Centre (SDC). Further details concerning policies and procedures may be found at:

http://www.sdc.uwo.ca/ssd/?requesting_acc

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.

Class Cancellations

In the event of a cancellation of class, every effort will be made to post that information on the Huron website, <http://www.huronuc.ca/accessibility> (“Postings of Service Disruptions”).

Accessibility

Huron University College strives at all times to provide its goods and services in a way that respects the dignity and independence of people with disabilities. We are also committed to giving people with disabilities the same opportunity to access our goods and services and allowing them to benefit from the same services, in the same place as, and in a similar way to, other customers. We welcome your feedback about accessibility at Huron. Information about how to provide feedback is available at: <http://www.huronuc.ca/accessibility>

Program and Academic Counselling

History of Science students registered at Huron who require advice about modules and courses

in Philosophy should contact Dr. S. D'Arcy, Chair, Department of Philosophy – sdarcy@huron.uwo.ca Students should contact Academic Counselling on other academic matters. See the Academic Counselling website for information on services offered. http://huronuc.ca/students/service_centre/academic_counselling/