

**HISTORY OF SCIENCE 323 / HISTORY 323**  
**The Scientific Revolution: from Copernicus to Newton**  
Spring 2009  
2:30-3:45pm TuTh  
224 Ingraham

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COURSE DESCRIPTION

This course investigates the renaissance and revolution in European science that began in 1543 with the heliocentric astronomy of Nicolaus Copernicus and ended with Isaac Newton's death in 1727. We will pay particular attention to issues of tradition and novelty, institutional settings for scientific activity, and the relationship between science and religion. Topics covered will include the Copernican cosmology and the trial of Galileo, the mechanical philosophy, Newton's theory of gravitation, the appearance of new scientific organizations such as the Royal Society of London and the Paris Academy of Sciences, the role of science in European exploration and expansion, and perceptions of the scientist's place in society.

This class also emphasizes the skills of analyzing historical documents and of constructing persuasive arguments about historical questions. It is therefore extremely important that you complete the readings assigned for each class session before coming to class. Please bring the readings – especially those in the Course Reader – to class with you.

COURSE REQUIREMENTS AND GRADING

1. Attend classes.
2. Prepare assigned readings.
3. Grades will be based on two (2) in-class group presentations and three (3) take-home essay exams. Grades will be calculated using the following rough guidelines:

two (2) in-class presentations, <b>March 10/12 + April 23/28</b>	~25%
exam 1 due in class, <b>March 3 (Tu)</b>	~25%
exam 2 due in my mailbox, <b>April 21 (Tu)</b>	~25%
exam 3 due by 2:00pm, <b>May 14 (Th)</b>	~25%

Honors students need to complete an honors assignment. Please see me for details.  
Graduate students should also enroll in History of Science 623 (for assignments, see the HoS 623 syllabus.)

COURSE POLICIES

I 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 263-2741 (<http://www.mcburney.wisc.edu/>) to establish your eligibility for services. If you require such accommodation, please let me know as soon as possible in the semester. All requests are confidential.

Academic honesty is expected of students at the University of Wisconsin-Madison in compliance with the student code of conduct. All written work that you turn in under your name should be solely your work. Both paper and internet sources must be acknowledged; failure to understand what counts as plagiarism is not an adequate excuse. Plagiarism and other forms of academic misconduct carry penalties. Feel free to talk to me if you have any questions about how to properly cite sources in your written work. You can also consult the Writing Center's guide to quoting sources (<http://www.wisc.edu/writing/Handbook/QuotingSources.html>).

TEXTBOOKS

- Course Reader (purchase in the History of Science dept. office, 7143 Social Science; no returns)
- Peter Dear, Revolutionizing the sciences, Princeton 2001 (purchase at the University Book Store, 711 State Street)

SCHEDULE OF ASSIGNMENTS AND TOPICS

CR = Course Reader

D = Dear, Revolutionizing the sciences (2001)

Jan 20 (T)	<b>introduction</b>
Jan 22 (Th)	<b>scientific renaissance</b> CR, 1-26 Vesalius, <u>On the fabric of the human body</u> (1543), selections D, 1-9, 30-33, 37-41 [intro + chap. 2, sections I + III]
Jan 27	<b>the Aristotelian cosmos</b> CR, 27-30 Aristotle, <u>Physics</u> , book II, selections D, 10-15 [chap. 1, section I]
Jan 29	<b>the Greek cosmological tradition</b> CR, 31-36 diagrams; Ptolemy, <u>Almagest</u> , bk. I, chaps. 2-4
Feb 3	<b>the Greek astronomical tradition</b> CR, 37-41 Ptolemy, <u>Almagest</u> , book I, chap. 7; planetary models
Feb 5	<b>the renaissance in astronomy</b> CR, 43 Peurbach, <u>New theoricis of the planets</u> (1475), illustration D, 15-24, 33-37 [chap. 1, sections II-III + chap. 2, section II]
Feb 10	<b>heliocentrism</b> CR, 45-57 Copernicus, <u>On the revolutions</u> (1543): 'To his holiness' + bk. I, intro + chap. 10; diagrams D, 33-37 [chap. 2, section II]
Feb 12	<b>responses to heliocentrism</b> CR, 45-46, 59 Copernicus, <u>On the revolutions</u> (1543), prefatory matter; Tycho Brahe material D, 41-45, 74-78, 101-104 [ch. 2, section IV; ch. 4, section III (Kepler); ch. 6, section I]
Feb 17	<b>heliocentrism</b> CR, 61-76 Kepler illustrations; Galileo, <u>Sidereal messenger</u> (1610) + diagrams D, 65-73 + 104-8 [ch. 4, sections I-III + ch. 6, section II]
Feb 19	<b>the Galileo affair (I)</b> CR, 77-84 timeline; Castelli-Galileo letters (1613) Council of Trent decrees
Feb 24	<b>the Galileo affair (II)</b> CR, 85-91 Bellarmine-Foscarini letter (1615); inquisition documents (1616) + Vatican letters (1631) Galileo, <u>Dialogue on the two chief world systems</u> (1632)
Feb 26 (Th)	Special Collections: introduction (meet in Memorial Library)
Mar 3 (Tu)	Special Collections: Sacrobosco (meet in Memorial Library) / <b>Exam 1 due in class</b>
Mar 5 (Th)	Special Collections: group project (meet in Memorial Library)

- Mar 10 (Tu) **science in print (I) : class presentations**  
Mar 12 (Th) **science in print (I) : class presentations**
- March 17-19 **spring break**
- Mar 24 **the skeptical crisis**  
CR, 109-112 Descartes, Discourse on the method (1637), selections  
D, 80-84 [ch. 5, section I]
- Mar 26 **monsters and marvels**  
CR, 131-143 Of two woonderful Popish monsters (1586), selections  
Paré, On monsters and prodigies (1573), selections
- Mar 31 **the Baconian project**  
CR, 144-154 Bacon, 'Preparative' (1620)  
D, 57-64 [ch. 3, sections III-IV]
- April 2 **experimentation**  
CR, 155-175 Galileo, Dialogue on the two world systems (1632)  
Boyle, 'New experiments' (1668)  
D, 131-45 [ch. 7, sections I-III]
- April 7 **mechanical philosophies**  
CR, 113-114 Descartes, Principles of philosophy (1644/1647), #203-207  
D, 84-86 [ch. 5, section II]
- April 9 **the Cartesian world**  
CR, 115-120 Descartes, The world (1633/1677), ch. 5-7  
D, 86-100 [ch. 5, sections III-VI] PT: 'Descartes'
- April 14 **the Newtonian world**  
CR, 121-126 Newton, System of the world (1685), selections  
Newton, Opticks (1706/1717), Query 31, selections  
D, 149-63 [ch. 8, sections I-II, esp. section II]
- April 16 **Newtonianism**  
CR, 127-130 Newton, 'General Scholium' (1713)  
D, 163-67 [ch. 8, sections II-III]
- April 21 (Tu) Philosophical transactions online exercise / **Exam 2 due (my mailbox)**  
CR, 93-108 Philosophical transactions 1 (1665): 1-16
- April 23 (Th) **science in print (II) : class presentations**
- April 28 (Tu) **science in print (II) : class presentations**  
April 30 **scientific societies (I)**  
CR, 179-191 Woodward, Brief instructions (1696)  
D, 111-23 [chap. 6, section IV]
- May 5 **scientific societies (II)**  
CR, 193-200 Cassini, 'Voyages to Cape Verde' (1684)  
CR, 201-225 Tachard, A relation of the voyage to Siam (1688), selections  
D, 111-30 [chap. 6, sections IV-V]
- May 7 **science and society**  
CR, 227-252 Bacon, New Atlantis (1627), selections;  
Swift, Gulliver's travels (1735), part 3, selections

Exam 3 due by 2:00pm MAY 14 (Th)

