

The Scientific Revolution of the 17th Century

HIS 322D — 39255
Fall 2011
GAR 0.102
MWF 11:00–12:00

Prof. Bruce J. Hunt GAR 2.106
hours: MW 3:30–4:00, F 10–11, & by appt.
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TAs: Frank Benn BUR 306 MW 12–1
Sean Killen BUR 306 MW 9:30–10:30

The Scientific Revolution of the 17th century produced a series of fundamental shifts in the ways people have understood the natural world and their own place in it. In this course we will examine the roots and course of this revolution and trace the outlines of the new world it helped to create.

Books: Peter Dear, *Revolutionizing the Sciences* (2nd edition, 2009),
John Henry, *Knowledge is Power* (2002),
Galileo Galilei, *The Essential Galileo* (ed. Maurice Finocchiaro, 2008),
James Gleick, *Isaac Newton* (2003),
Michael Matthews (ed.), *The Scientific Background to Modern Philosophy* (1989).

Course grades will be +/- and will be based on three essay exams (25% each) and a short paper on a topic to be assigned (25%). There will be no separate final exam. In place of the second exam, you may elect to write a 5–7 page research paper, due on Oct. 28. If you choose to write such a paper, you must meet with me and get an appropriate topic approved by Oct. 7.

We will not take daily attendance, but to do well in the course you will need to pay close attention to all of the lectures.

Lecture outlines, supplementary course materials, and more detailed information on course policies, TA contact information, and the like will be posted on Blackboard.

Aug. 24 Introduction: the Scientific Revolution of the 17th century

Aug. 26 The Aristotelian system
(Dear, 1–18)

Aug. 29 Ptolemaic astronomy

Aug. 31 Arabic science and its reception in the West

Sept. 2 New worlds of the 16th century: exploration, printing, and the Reformation
(Dear, 18–32)

Sept. 7 Paracelsus, alchemy, and the powers of Nature

Sept. 9 The new anatomy: Vesalius's *De Fabrica*
(Dear, 32–50; Matthews, 33–44)

Sept. 12 The origins of Copernicus's *De Revolutionibus*

Sept. 14 Early responses to Copernicus

Sept. 16 Francis Bacon and the experimental philosophy
(Dear, 55–59; Henry, 1–81; Matthews, 45–52)

Sept. 19 Francis Bacon and the uses of knowledge

Sept. 21 Review: the roots of the Scientific Revolution

Sept. 23 **First hour exam** (25%)
(Dear, 60–63; Henry, 82–165)

- Sept. 26 William Gilbert and the magnetic Earth
 Sept. 28 Tycho Brahe and observational astronomy
 Sept. 30 Johannes Kepler and his mathematical vision
 (Dear, 50–55, 64–66, 72–78)
- Oct. 3 Kepler’s laws of planetary motion
 Oct. 5 Galileo and the telescope
 Oct. 7 Galileo and the Church
 (Dear, 66–72, 99–106; Galileo, 1–16, 45–70, 83–84, 103–67, 190–92, 267–71)
- Oct. 10 Galileo and the physics of motion
 Oct. 12 Discussion: Galileo in context; **short papers due (25%)**
 Oct. 14 — to be announced —
 (Dear, 120–26, 134–37; Galileo, 185–89, 300–6, 349–51)
- Oct. 17 William Harvey and the heart; Blaise Pascal and the air
 Oct. 19 René Descartes and his “Method”
 Oct. 21 The mechanical philosophy
 (Dear, 79–98, 106–9, 127–37; Matthews, 87–108)
- Oct. 24 Science and ideology in the English Civil War: Thomas Hobbes
 Oct. 26 Review: the central phase of the Scientific Revolution
 Oct. 28 **Second hour exam; optional papers due (25%)**
- Oct. 31 Organizing science: societies, academies, and journals
 Nov. 2 The new experimentalism: Robert Boyle and the air pump
 Nov. 4 — no class —
 (Dear, 109–20)
- Nov. 7 The ingenious Robert Hooke
 Nov. 9 Christiaan Huygens, the pendulum, and the laws of motion
 Nov. 11 Isaac Newton (1642–1727): “Never at Rest”
 (Dear, 137–42, 145–53; Matthews, 109–32)
- Nov. 14 Newton on light and color
 Nov. 16 Newton on force and motion
 Nov. 18 The roots of Newton’s *Principia*
 (Dear, 142–44; Gleick, 3–98; Matthews, 133–48)
- Nov. 21 The Newtonian world system
 Nov. 23 Newton and Newton’s God
 (Dear, 154–66; Gleick, 99–191; Matthews, 148–58)
- Nov. 28 Review: the culmination of the Scientific Revolution
 Nov. 30 Science and the modern world; course evaluation
 Dec. 2 **Third hour exam (25%)**

Academic integrity: All students will be expected to live up to the highest standards of academic integrity, and in particular to observe the policies on plagiarism, unauthorized collaboration, and related matters laid out in the section on “Scholastic Dishonesty” found under the “UT Policies” link on the course Blackboard page.

Students with disabilities: Students with disabilities may request appropriate academic accommodations from Services for Students with Disabilities at 471-6259 or 232-2937 (video phone), or at <http://www.utexas.edu/diversity/ddce/ssd>