History of Science Since the Seventeenth Century

HSCI 3023 / Fall 2013 / Section 001 / CRN 15563

University of Oklahoma, Department of the History of Science

Class Meeting Time/Place: MWF 9:30–10:20am, PHSC 0100

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Office Hours: Mon./Wed. 11am–1pm PHSC 611 (or by appointment via email)

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Office Hours: Wednesdays, 11am–1pm, PHSC 616 (or by appointment)

COURSE DESCRIPTION AND OBJECTIVES

This course surveys the development of modern science from about 1650 to the present, since the so-called “Scientific Revolution.” In this period science became one of the central forms of western culture. By considering examples from the history of the physical, life, and social sciences as well as medicine and technology, we will explore how science shapes, and is shaped by, the culture in which it develops. We will consider scientific ideas, institutions, and practices, as we examine science’s power, promise, and problems. What is science? Who counts as a scientist? What does it mean to be scientific? The course aims to teach historical narratives of modern science, to reflect on its broader ethical, political, and human significance, and to help students sharpen their general academic reading, writing, and critical thinking skills.

Required Textbooks

NOTES
[1] Please keep this paper copy of this syllabus. You will need to refer to it often and may want to mark it up with notes. An electronic copy with live weblinks will be available on D2L.
[2] This syllabus is a working document, designed to be flexible as needed. I reserve the right to make changes to assignments, due dates, schedule, readings and so on, but I will give fair warning in advance of any changes.

EXPECTATIONS, POLICIES, ASSIGNMENTS

Attendance/Participation
We take attendance each class period. Come to class having completed the readings and prepared to discuss them. Learning is an active, group process; the more we participate, the more we learn. Active participation—both speaking and listening—enriches learning for everyone. Your participation grade will reflect both quantity (how often you speak) and quality (how well you speak). Occasionally we will discuss sensitive or controversial topics like sexism,
religion, or racism. Please be respectful, courteous and civil with your fellow students and with me, be attentive and sensitive to what we have to say, and above all use common sense.

Technology Policy
You may use laptops in class to take notes, but please do not browse the web (email, facebook, etc.). If you pay attention to your laptop instead of class, it is your loss. A major Canadian study just found that students who use laptops to take notes get lower grades than students who use paper. Please turn off or silence all cell phones and handheld devices; if your phone rings during class, this is not your loss, but disrupts class for everyone else.

Individual Circumstances or Needs
If you have to miss class for religious observance, let us know in advance and your absence and it will not affect your participation grade. If you have a learning disability, physical disability or other special needs, please let us know in the first week of class, provide documentation if necessary, and we will do everything we can to help meet your needs.

Assignments and Grading
This course is graded on a 1,000-point scale: A = 1,000–900 pts; B = 899–800 pts; C = 799–700 pts; D = 699–600 pts; F = 599–500 pts.

Short Paper (150pts) – a 4–5 page response to and analysis of 2–3 of the primary source readings assigned in weeks 1-6. Due October 4.
Midterm Exam (175pts) – an in-class blue book exam, Wednesday, October 16.
Final Exam (225pts) – an in-class blue book exam, Wednesday, December 11.
Participation (250 pts) – an evaluation of your attendance and participation in class this semester. There are 44 class meetings this semester: you get 3 points for each one you attend, for a possible total of 132 pts just for showing up. The other 118 pts evaluate your participation.

Written Work
Papers should have standard margins (1-1.5 inches top, bottom, and sides), be in 11-12 point font, and be double-spaced. Please proofread carefully for grammar and spelling. Having someone else—a classmate, friend or parent, or a someone at the OU Writing Center—proofread your papers is a good idea. Others always notice mistakes in your work more readily than you will. Late papers will be counted down 1/3 of a letter grade (3%) for each day late.

All written work is governed the University of Oklahoma’s Integrity Policy. Please print, date, and sign the Integrity Pledge on all assignments: http://integrity.ou.edu/faq.html. Academic misconduct, especially plagiarism, may result in: (a) asking you to resubmit an assignment for a new grade, (b) giving you a formal warning and/or a zero on the assignment, or (c) filing an official complaint of academic misconduct with the Provost's office. For more on academic integrity and misconduct, see: http://www.ou.edu/honorcouncil/, and http://www.ou.edu/provost/integrity-rights/.
COURSE SCHEDULE

WEEK 1: 8/19 - 8/23 — Introducing the History of Science
Mon. 8/19: Course Introduction: What is History of Science? What is Modern Science?

George Orwell, “What is Science?” (1945), PDF on D2L.
Raymond Williams, “Ideas of Nature” (1980), PDF on D2L.

Wed. 8/21: Discuss this week’s readings


Fri. 8/23: Lecture: Was There a “Scientific Revolution”?

Homework: Galileo, Letter to the Grand Duchess Christina (1615):
http://www.fordham.edu/halsall/mod/galileo-tuscany.html

WEEK 2: 8/26 - 8/30 - Founding Modern Science, c. 1500-1750
Mon. 8/26: Discuss Galileo reading


Wed. 8/28: Lecture: The Age of Newton


Fri. 8/30: Discuss Voltaire and Bowler/Morus readings
[Professor out of town]

Homework:
Bowler and Morus, *Making Modern Science*, Ch. 3
Jean le Rond d’Alembert, “Preliminary Discourse” to Diderot’s *Encyclopedia*, http://hdl.handle.net/2027/spo.did2222.0001.083
John Dalton, *A New System of Chemical Philosophy*, 1808
http://web.lemoyne.edu/~giunta/dalton.html

**WEEK 3: 9/2 – 9/6** - The Enlightenment and the Chemical Revolution, c. 1750-1850

Mon. 9/2: NO CLASS – LABOR DAY

Wed. 9/4: Discussion: Primary Sources (Kant, d'Alembert, Pristley, Dalton)
[Professor out of town]

Fri. 9/6: Lecture: The Enlightenment & The Chemical Revolution


**WEEK 4: 9/9 – 9/13** - The Industrial Revolution and Geological Time, c. 1750-1850

Mon. 9/9: Lecture: The Industrial Revolution

Homework: Thomas Carlyle on the “Mechanical Age” from *Signs of the Times* (1829)
http://www.fordham.edu/halsall/mod/carlyle-times.html

Wed. 9/11: Discussion: Carlyle's “Mechanical Age”

Homework: Bowler and Morus, *Making Modern Science*, Ch. 5 The Age of the Earth

Fri. 9/13: Lecture: Geology and the Age of the Earth

Homework: Bowler and Morus, *Making Modern Science*, Ch. 6 The Darwinian Revolution, Ch. 7 The New Biology

**WEEK 5: 9/16 – 9/20** – Biology, Evolution, and Darwin, the Victorian Era

Mon. 9/16: Lecture: Changes in Biology

Wed. 9/18: Lecture: Darwin and Evolutionary Biology

Homework:
Herbert Spencer (1820-1903): “Progress: Its Law and Causes” (1857), excerpts
http://www.fordham.edu/halsall/mod/spencer-darwin.html
Charles Darwin (1809-1882): *On the Origin of Species* (1859), excerpts
http://history.hanover.edu/courses/excerpts/111dar.html
http://www.fordham.edu/halsall/mod/1860wilberforce-darwin.html
Stephen Jay Gould, “Kropotkin was no Crackpot” (1997):
http://www.marxists.org/subject/science/essays/kropotkin.htm
Fri. 9/20: Discussion: Darwin, his Critics, and his Champions


**First Short Paper Assignment (3-5 pages):** analyze and respond to any 2-3 of the online primary sources assigned in Weeks 1-6. Due Friday October 4.

**WEEK 6: 9/23 – 9/27 - Biology, Culture, Ideology, Politics**

Mon. 9/23: Lecture: Connecting Science, Ideology, and Religion


Wed. 9/25: Lecture: Science and Culture

Homework: Continue Wells, *The Invisible Man*

Fri. 9/27: Lecture: Science Fiction

Homework: Finish *The Invisible Man*

**WEEK 7: 9/30 - 10/4 – Science & Culture / Science & Medicine**

Mon. 9/30: Discuss *The Invisible Man*


Wed. 10/2: Lecture: Science and Medicine

Homework: finish First Paper

Fri. 10/4: Lecture: Public Health and Epidemiology *** First Paper Due ***

Homework: Bowler and Morus, *Making Modern Science*, Ch. 8 Genetics & Ch. 13 The Emergence of the Human Sciences (299-319)

**WEEK 8: 10/7 - 10/11 - Science, Medicine, and Politics late 1800s - early 1900s**

Mon. 10/7: Lecture: The Social Sciences

Homework: Albert Calmette, “The Plague at Oporto” (1899); Mahatma Gandhi, “The Plague Panic in South Africa” (1899), PDFs on D2L.

Wed. 10/9: Discussion: Science and Politics
Handouts: Definitions of Politics, Midterm Review Sheet

Fri. 10/11: NO CLASS – TEXAS FRIDAY / SHOT CONFERENCE

WEEK 9: 10/14 - 10/18: MIDTERM (covers weeks 1-8)

Mon. 10/14: MIDTERM REVIEW

Wed. 10/16: MIDTERM EXAM

Homework: Bowler and Morus, Making Modern Science, Ch. 21 Science and Gender (487-511)

Fri. 10/18: Lecture: Science and Gender – “A Tale of Two Marys”

Homework: Start Levitt, Typhoid Mary

WEEK 10: 10/21 – 10/25: Science and Society, early 1900s

Mon. 10/21: Science, the Media and the Public
In-class activity with The Popular Science Monthly, editor’s statements, 1872 and 1915

Homework: Leavitt, Typhoid Mary, Prologue, Intro and Ch. 1 (xvii-39)

Wed. 10/23: Discuss Typhoid Mary part 1

Homework: Start Leavitt, Typhoid Mary Chs. 2–4 (39-126)

Fri. 10/25: Lecture: Science in International Perspective

Homework: Finish Leavitt, Typhoid Mary Chs. 2–4 (39-126)

WEEK 11: 10/28 – 11/1: Science and Society, early 1900s Pt. 2

Mon. 10/28: Discuss Typhoid Mary part 2

Homework: Start Leavitt, Typhoid Mary, Ch. 5 and Conclusion (126-255)

Wed. 10/30: Lecture: Disease and the Stranger: Immigration and Globalization

Homework: Finish Leavitt, Typhoid Mary, Ch. 5 and Conclusion (126-255)

Fri. 11/1: Discuss Typhoid Mary, part 3

Homework: Bowler and Morus, Making Modern Science, Ch. 11 Twentieth-Century Physics & Ch. 20 Science and War (253-277, 463-487)
Begin Book Review Essay (8-10 pages, due December 6)

**WEEK 12: 11/4 – 11/8: Revolution in Physics, the Age of World Wars, c. 1900-1945**

Mon. 11/4: Watch *Einstein’s Big Idea* (PBS 2005), part 1

Homework: Start Levi, *Survival in Auschwitz* (pp. 1-100)

Wed. 11/6: Lecture: Science, Technology, and Total War

Homework: Continue Levi, *Survival in Auschwitz* (pp. 1-100)

Fri 11/8: Discuss *Survival in Auschwitz* part 1 (pp. 1-100)

Homework: Continue Levi, *Survival in Auschwitz* (pp. 100-173)

**WEEK 13: 11/11 – 11/15: Totalitarian Science?**

Mon. 11/11: Watch *Einstein’s Big Idea* (PBS 2005), part 2

Homework: Continue Levi, *Survival in Auschwitz* (pp. 100-173)

Wed. 11/13: Lecture: Nazi Science and “Brain Drain”

Homework: Finish Levi, *Survival in Auschwitz* (pp. 100-173)

Fri. 11/15: Discuss *Survival in Auschwitz* part 2 (100-173)

Homework: Vanevar Bush, *Science the Endless Frontier* (1945) (PDF on D2L)

**WEEK 14: 11/18 – 11/22 – Science: the Endless Frontier?**

Mon. 11/18: Discuss Bush and Rudolph readings

Homework: Bowler and Morus, *Making Modern Science*, Ch. 9 Ecology and Environmentalism, Ch. 10 Continental Drift (213-253)

Wed. 11/20: Lecture: Ecology


Fri. 11/22: Lecture: Cosmology
Homework: Start *Double Helix*

**WEEK 15: 11/25 – 11/29 – DNA / THANKSGIVING**

Mon. 11/25: Lecture: Bioethics

Homework: Continue *Double Helix*

Wed. 11/27 & Fri. 11/29: THANKSGIVING – NO CLASS

Homework: Finish *Double Helix*

**WEEK 16: 12/2 - 12/6 - Science and Society Revisited / FINAL REVIEW**

Mon. 12/2: Discuss *Double Helix*; Hand out final exam review sheets

Homework: review for FINAL EXAM

Wed. 12/4: Lecture: The CSI Effect – Science, the Media, and the Justice System

Homework: review for FINAL EXAM

Fri. 12/6: FINAL EXAM REVIEW (covers weeks 9-16) *** Book Review Essay Due ***

**WEEK 17: FINAL EXAMS WEEK**

FINAL EXAM: Wednesday, December 11, 8:00–10:00am