History of Science since the 17th Century

Section 002
MWF 12:30 – 1:20 pm
BL 521

Professor: Kathleen Crowther
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Course Description:
This course examines the development of science from the 18th century to the 20th century. We will explore three interrelated questions: 1) What did people in the past know about nature? In other words, how did they explain natural phenomena such as the motions of the planets, the workings of the human body and the behavior of animals? 2) How did people in the past go about investigating the natural world? What tools or methods did they believe would yield information about natural objects, phenomena and processes? 3) How did people in the past understand Nature? For example, did they believe it was law like and regular or random and chaotic? Divinely created or spontaneously generated? Throughout the course we will seek to connect scientific ideas and scientific practices to the broader social and cultural contexts in which they were developed.

The class will be a mixture of lecture and discussion. You should complete each day’s assigned reading BEFORE you come to class.

Note:
Please use your OU email account, or arrange for email to be forwarded from that account to the one you use. This will ensure that you receive course-related emails. I encourage you to check the course web site (on D2L) regularly for announcements and reminders about paper deadlines and exam dates.

Written Assignments:
One goal of this course is to help you develop analytic and critical skills through written work. To this end, you will be expected to turn in two written assignments, one short (5-7 page) paper on an assigned topic and one long (10-12 page) research paper on a topic of your choosing.

Grading Policy:
Midterm 20%
Final 30%
Short paper 15%
Long paper 35%

Required Texts:
The following texts are available in the University bookstore.
Dorinda Outram, *The Enlightenment*
Philip Appleman, *Darwin*
Edward Larson, *Summer for the Gods*
Sigmund Freud, *Civilization and its Discontents*
H. G. Wells, *The Time Machine*
Michael Stoff et al. (eds.), *The Manhattan Project*

All other readings will be available on line on our D2L site.

**Schedule:**

**Week 1**
Jan 20. Introduction

Jan 22. The Scientific Revolution and the Newtonian Cosmos

**Week 2**
Jan 25. Science and the Enlightenment
    Reading: Dorinda Outram, *The Enlightenment*, chapters 1-4

Jan 27. Science and the Enlightenment
    Reading: Peter Gay, "The Uses of Nature" from *The Enlightenment*

Jan 29. Science and the Enlightenment
    Reading: (1) Isaac Newton, "General Scholium" from *Mathematical Principles of Natural Philosophy*; (2) Bernard de Fontenelle, *Conversations on the Plurality of Worlds*, excerpts

**Week 3**
Feb 1. Nature and the Enlightenment
    Reading: Dorinda Outram, *The Enlightenment*, chapters 5-6

Feb 3. Nature and the Enlightenment
    Reading: Dorinda Outram, *The Enlightenment*, chapters 7-8

Feb 5. Nature and the Enlightenment
    Reading: (1) Londa Schiebinger, "Why Mammals Are Called Mammals: Gender Politics in Eighteenth-Century Natural History"; (2) Thomas Laqueur, "Orgasm, Generation, and the Politics of Reproductive Biology"

**Week 4**
Feb 8. The Chemical Revolution

Feb 10. The Discovery of Oxygen and the Chemistry of Life
Feb 12. The Mad Scientist

**SHORT PAPER DUE**

**Week 5**
Feb 15. Natural History and Voyages of Exploration
Reading, Michael Adas, *Machines as the Measure of Man*, excerpts

Feb 17. Geology and Evolution Before Darwin

Feb 19. Natural Theology
Reading: William Paley, *Natural Theology*, pp. 1-55

**Week 6**
Feb 22. Charles Darwin's *Origin of Species* and the Victorian Crisis of Faith

Feb 24. Victorian Responses to Darwin

Feb 26. Darwin's *Descent of Man*

**Week 7**
Mar 1. Victorian Popular Science
Reading: Arthur Conan Doyle, "The Adventure of the Blue Carbuncle"

Mar 3. Victorian Science for Children

Mar 5. **MIDTERM**

**Week 8**
Mar 8. Fundamentalism and Creationism: The Scopes “Monkey Trial"
Film: “Inherit the Wind” (in class)

Mar 10. The Scope "Monkey Trial" and its Aftermath
   Reading: Edward J. Larson, *Summer for the Gods*

Mar 12: Darwin on Trial in Modern America

**SPRING BREAK (March 13-21)**

**Week 9**
Mar 22. The Laboratory Revolution

Mar 24. The Laboratory Revolution

Mar 26. Domestic Science
   Reading: Nancy Tomes, *Gospel of Germs*, pp. TBA

**Week 10**
Mar 29. Sigmund Freud and the New Science of the Mind
   Reading: Frank Sulloway, *Freud, Biologist of the Mind* (Cambridge, MA: Harvard University Press, 1979), ch. 9 "Dreams and the Psychopathology of Everyday Life"

Mar 31. Sigmund Freud and the New Science of the Mind

Apr 2. Sigmund Freud and the New Science of the Mind
   Reading: Sigmund Freud, *Civilization and its Discontents*

**Week 11**
Apr 5. Heat, Time and Energy – The Birth of Thermodynamics


Apr 9. Heat, Time and Energy – The Birth of Thermodynamics
   Reading: H. G. Wells, *The Time Machine*

**Week 12**
Apr 12. The Quantum Revolution
   Reading: TBA

Apr 14. The Quantum Revolution

Apr 16. The Quantum Revolution
   Reading: Spencer R. Weart, *Nuclear Fear*, pp. 1-74
**Week 13**
Apr 19. The Manhattan Project

Apr 21. The Manhattan Project

Apr 23. The Manhattan Project
   Reading: Michael Stoff et al. (eds.), *The Manhattan Project*, Documents 1, 7, 30, 38, 39, 41, 48, 49, 52, 68, 72, 76, 77, 84, 91, 93, 95

**Week 14**
Apr 26. Eugenics and Human Genetics

Apr 28. Human Genetics and the Human Genome Project

Apr 30. Genetic and Reproductive Technologies in the 21st century
   **RESEARCH PAPER DUE**

**Week 15**
May 3. Global Warming
   Reading: TBA

May 5. Global Warming

May 7. Review for final exam

**Final Exam:** Wednesday, May 12, 1:30 – 3:30 pm