Description
This course studies the development of modern science from the seventeenth century to the present, focusing on Europe and the United States. Key questions include: What is science, and how is it done? How are discoveries made and accepted? What is the nature of scientific progress? What is the impact of science on society? What is the impact of society on science? Topics will be drawn from the histories of physics, chemistry, biology, psychology, and medicine.
Requirements

This class requires 1) active participation in lectures and weekly recitation sections, 2) a series of written assignments, and 3) a midterm and final exam.

Recitation Sections

Each week’s readings must be read prior to recitation section. Active participation in the discussions is required.

Weekly Writing Exercises

There will be a short (roughly 300 words) reading response assignment that must be submitted via the Stellar site by 9 am every Thursday, except the two weeks when papers are due. PDF format is preferred, but DOC and TXT are also allowed.

Papers

There will be two required papers, 1800 and 2400 words. The papers must be submitted via the Stellar site by 11:59 pm on March 15 and May 8.

For bibliography questions, feel free to consult the reference librarian for history of science and technology Michelle Baildon, <baildon@MIT.EDU>, Room 14S-222, x 3-9352.

Another resource is the Writing and Communication Center (12-132), which offers you free professional advice from published writers about all types of academic, creative, and professional writing. Go to http://web.mit.edu/writing and click on the yellow sunburst. If you cannot find an open appointment slot, do not despair. There are always cancellations on the day of the appointment. Click on the Wait List (the blue strip that says “Is the time that you want already reserved?”) Whenever a cancellation occurs on that day, you will be automatically notified by email. Because several people might receive that same message, go online ASAP to schedule that open spot; 96% of clients who want an appointment end up with one if they use the Wait List. If you can’t find an appointment, you can drop by the Center and sign up to be a drop-in client and/or try the Online Tutor at http://web.mit.edu/writing/Center/onlinetutor.html. The Center’s core hours are Monday-Friday, 9:00 a.m.-6:00 p.m.; evening and weekend hours vary by semester – check the online scheduler for up-to-date hours.

Readings

Most readings are available in the Materials section of the Stellar site. Two required books are available for purchase at the MIT Coop, and are on reserve at Dewey Library:


Exams

There will be closed-book midterm and final exams, based on material from both lectures and readings. The midterm will be given during the class on March 19.

Grading

Final grades will be based on:
- Participation in discussions (15%)
- Weekly writing (15%)
- Paper 1 (15%)
- Midterm (15%)
- Paper 2 (20%)
- Final Exam (20%).

CLASS SCHEDULE

<table>
<thead>
<tr>
<th>LECTURES</th>
<th>ASSIGNMENTS</th>
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<tr>
<td><strong>Week 1. The Legacy of the Scientific Revolution</strong></td>
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<tr>
<td>02/03 1. Introduction: The Rise of Modern Science</td>
<td>Week 1</td>
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<tr>
<td>02/05 2. The Legacy of the Scientific Revolution</td>
<td>no readings</td>
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| Weeks 2-3. Enlightenment Science | |
| 02/10 3. Science in the Enlightenment | Week 2 |
| 02/12 4. Natural History and Colonialism | The Culture of Experiment |
| 02/17 No class (Monday schedule) | Week 3 |
| 02/19 5. Enlightenment Chemistry | A New Language of Science |

| Weeks 4-5. The Nineteenth Century: Organism and Mechanism | |
| 02/24 6. Romantic Science | Week 4 |
| 02/26 7. The Science of Life | Science and Life |
| 03/03 8. Thermodynamics and the Industrial Revolution | Week 5 |
| 03/05 9. Physics and the Telegraph | Science, Technology, and the Human Body |

| Weeks 6-7. Evolution | |
| 03/10 10. Darwin and Natural Selection | Week 6 |
| 03/12 11. Evolution and Society | Science and Religion |
| 03/17 12. Scientific Medicine | **Paper 1 due March 15** |
| 03/19 **Midterm** | Week 7 |
| | no readings |
Weeks 8-9. Fin-de-Siècle and the Crisis of Objectivity
03/31 13. The Image of Objectivity Week 8
04/02 14. Freud and the Science of the Mind Psychiatry and Society
04/07 15. Relativity Theory and Swiss Clocks Week 9
04/09 16. Quantum Mechanics and Postwar Culture Interpreting Relativity

Weeks 10-11. Science and War
04/14 17. Science and World War II Week 10
04/16 18. Physics and the Cold War Physics and War
04/21 No class (Patriots’ Day holiday) Week 11
04/23 19. Sputnik and the Origins of the Space Race Cold War Science

Weeks 12-13. Genetics and Society
04/28 20. Eugenics Week 12
04/30 21. Molecular Biology Eugenics and Social Control
05/05 22. Genetics Week 13
05/07 23. Genetic Engineering Engineering Life

05/12 24. The Race for the Human Genome Week 14
05/14 25. Course Overview no readings

READINGS

Week 2: The Culture of Experiment


Additional Background:
Week 3: A New Language of Science


Week 4: Science and Life


Additional Background:

Week 5: Science, Technology, and the Human Body


Additional Background:

Week 6: Science and Religion

for Existence.” [Full facsimile edition available at
http://www.esp.org/books/darwin/origin/facsimile/title3.html]


- Marc Caputo, “Florida schools to teach evolution as ‘scientific theory’,” *Miami Herald* (20 February 2008); http://www.commondreams.org/archive/2008/02/21/7208

Additional Background:

**Week 7: Midterm**

**Week 8: Psychiatry and Society**


Additional Background:

**Week 9: Interpreting Relativity**


Additional Background:
**Week 10: Physics and War**


Additional Background:
- Links to four academic symposia discussing Frayn’s play: http://ohst.berkeley.edu/publications/copenhagen/index.html (scroll down)
- Documents relating to the 1941 Bohr-Heisenberg meeting; available at http://www.nba.nbi.dk/release.html

**Week 11: Cold War Science**


Additional Background:

**Week 12: Eugenics and Social Control**


Additional Background:

**Week 13: Engineering Life**


Additional Background:
• Bowler and Morus, “Genetics,” MMS, pp. 189-212.