McDaniel College, Campus in Budapest

GSC 2010 – History of Modern Science

Professor: Matthew Adamson

Contact information
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Availability
I am usually on campus in Room 225; please make an appointment if you want to be certain to find me.

Course Description

What is science? What role do philosophical, social, and political factors play in the construction of scientific knowledge? Are scientific organizations and conduct unique? How have scientific disciplines formed and changed over the centuries? What is the relationship between science and the state? What is the nature of scientific knowledge, and how should society put it to use? What use is biography in better understanding history, history of science included? How has science become embedded in defense and intelligence-gathering, foreign relations, and diplomacy? Finally, how has science as a global enterprise been understood—and sometimes misunderstood—as such? This course will trace the history of science from the 16th century to the end of the 20th century. It will examine both primary texts written by scientists and secondary texts written by historians. By looking at how science has happened in certain places and times, the course aims to show how the historical contingency of scientific activity guides us to answers to all of the above questions.

Course Objectives

- Explore primary texts from the history of science, placing them in their social, philosophical, and institutional contexts;
- Examine work by a number of historians of science, considering in each text different approaches, different methods of historical observation, different contexts in which scientific work and knowledge is framed;
- Explore how experimental methods were developed, debated, proved fruitful, and were ultimately accepted in different disciplines;
- Explore the economic, social, and security frameworks in which scientific research has been pursued;
- Examine the link between scientific research and the state;
- Reflect on how science has been construed in national, regional, international, and global contexts;
- Consider the role of history in informing our values and collective decision-making

processes.

Learning Outcomes

- Recall and describe in basic terms the important milestones of natural scientific discovery and theory-building in the last four centuries;

- Identify the most significant figures in the history of science in the modern period and learn the basics of their achievements in physics, chemistry, biology, geology, astronomy, and so on;

- Better understand controversy *in* the scientific community, and controversy *about* scientific conclusions;

- Appreciate the dynamic, ever-changing link between scientific and technological development;

- Apprehend the growth of science and scientific disciplines as historical phenomena;

- Recognize the global nature of historical scientific practice and knowledge;

- Sharpen one's ability to analyze and contextualize historical arguments.

Required texts

- Class reading assignments available on Blackboard
- Handouts during the semester

Assignments & grading

Grading system—100 points total

Assignments

*Essays, presentations, other assignments (50 pts)
*Mid-term essay and discussion (20 pts)
*Final essay and discussion (20 pts)
*In-class participation (10 pts)

Standard McDaniel College scale:

100+	A+
93-100	A
90-92	A-
88-89	B+
83-87	B
80-82	B-
78-79	C+
73-78	C
70-72	C-
68-69	D+

63-67 D
60-62 D-
< 60 F

Class participation

Informed, critical exchange of ideas forms the core of the College learning experience. It should occur in every classroom. This is why in-class participation plays an important role in the final determination of your course grade. You are expected to share ideas during discussions in person and online and you are wholeheartedly encouraged to ask questions when you do not understand something. Participation implies attendance when possible; if you must be absent or if you are learning remotely this semester, then participation will require response to assignments provided explicitly to you.

Creation of a proper classroom environment requires above all else respect for fellow students. We all ask that you don't be late; that you don't surf the internet on your laptop or otherwise distract everyone else during class (in person and online); that you turn off your cell phone and that you do not check for messages during class. Likewise, you can expect me to end class on time, to engage you in discussion and debate, and to be respectful of all points of view.

Honor code
You are expected without question to adhere completely to the McDaniel College academic honor code. Any violation will result in a zero for the given assignment and other possible sanctions.

Course policies
Do not be late—a tardy arrival either in person or online will adversely affect your grade.

Use of phones and laptops: use of phones is prohibited. Therefore, you are encouraged to avoid the temptation of checking your phone by putting the phone away and/or turning it off during the class. Use of a laptop during class is possible. (Obviously, it's entirely necessary when we are online!) In this case, from time to time I will kindly ask you to send me a copy of your notes. I will not grade those notes; rather, your notes in such a case serve not only to confirm the diligent use of your laptop, but also give me a sense of what you and other students are taking away from the course—quite an appreciated service if it turns out I should need to make an adjustment.

Discussions & participation
Much hinges on students' participation in discussion, including student-led discussions. On the first day of class, we will discuss the goals we have for reading and analyzing primary and secondary sources, as well as the ground rules for conducting and participating in a discussion, in person and online.

Topics covered during the semester

(Topic areas, readings, and links to videos and other materials will be visible on the Blackboard page in the Course Documents section, organized week by week. Assignments will be found in, well, "Assignments." Additional materials and information will be added in

other sections as the semester unfolds.)

Introduction: The Contingency and Centrality of Science.

The Global Scientific Revolution.

Newton, Biography and History of Science.

Revolution and Science in the 18th Century

Natural History and the Young Darwin

Darwin and Evolution

Institutions, Science, and the State in the 19th Century

The Natural Sciences and the Scale of Science at the Beginning of the 20th Century

Science, Medicine, and Disease: The Great Influenza of 1918-1919

Science and War

The Nuclear Age

Little Science & Big Science

Science, Security, and the Cold War

The Global Circulation of Technoscience

The Environmental Sciences

The Anthropocene Age—Science and the Relationship between Humanity and the Earth