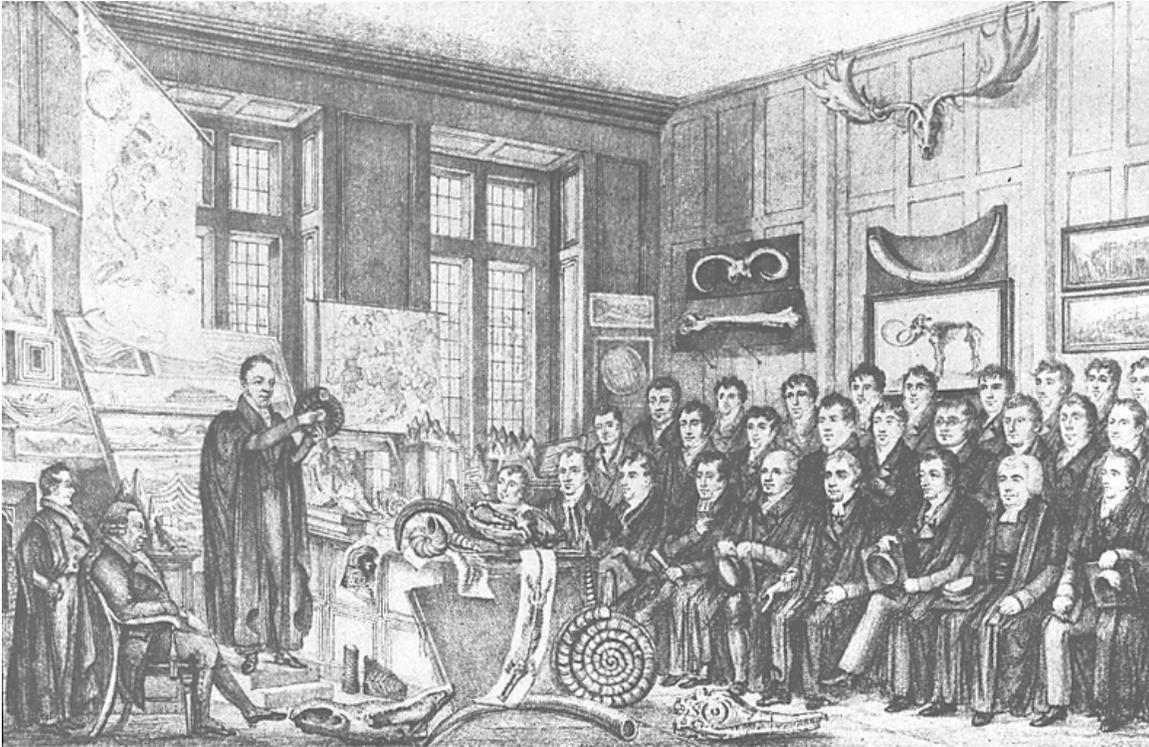


HIST 2P76

Making Modern Science



Monday
1700-1900
TH 256

Elizabeth Neswald
573 Glenridge Ave.
History Department office 227
T.: 905-699-5550-5327
Email: eneswald@brocku.ca
Office hours: Thursdays 14:30-15:30 and by appointment

Course Description

This course is an introduction to the history of science from the late eighteenth to the mid-twentieth century. The history of science is not only a history of events, discoveries and discoverers. Scientists participated in the culture of their times. Their institutions, research methods and knowledge were deeply influenced by the social, intellectual and natural world around them. This course approaches the history of science as part of cultural history. It asks what various material and intellectual resources scientists drew upon to develop, promote and establish their ideas, how the modern concept of science, scientific objectivity and methods emerged and what role the public played in establishing the authority and credibility of science.

Assessment Criteria

Seminar Participation

20%

Seminar attendance is **MANADTORY**. More than one unexcused absence will jeopardise your grade. Attendance is **NOT** enough to pass the seminar. You will be expected to do the required readings before the seminar, prepare questions, comments and observations on the readings and participate actively in the discussion. Participation does not mean just talking, it means making insightful, thoughtful, prepared contributions. Quality is more important than quantity. I **MAY** ask you to prepare questions for a seminar session and submit them in class. These will constitute part of your seminar mark for that day.

Seminar Facilitation

10%

Each student will be expected to prepare and lead a seminar discussion.

Essay outline and bibliography

10%

A one page description of your essay topic in full sentences, including a) the essay topic (what you want to write about), b) your thesis (your question, how you want to look at this topic, what you want to find out and prove), c) your argument (what steps you want to take to prove it and in what order) **AND** a bibliography of at least **SIX** sources that you think you will need to write this essay. The bibliography should include at least **ONE** primary source**, at least **ONE** book and at least **ONE** journal article. The bibliography should be properly formatted according to the guidelines given in **Rampolla, Pocket Guide to Writing History**. To be handed in to your instructor at the start of seminar on **October 21**..

Essay topics are listed at the end of the syllabus. Consult your TA if you would like to do a topic that is not on the list.

***Primary sources are material from the time period you are writing about (a text written by Darwin, Kant or Einstein, for example, is a primary source). Secondary*

sources are works written by historians about the topic (about Darwin, the Royal Society, the atom bomb, etc.).

Research Essay

30%

A research paper of 2000-2500 words on a topic relevant to the course (see topic list, last page of syllabus). You will be expected to use different kinds of source material and to develop an argument. You are expected to use at least SIX sources, including books, journal articles, online-journals and primary source material. At least ONE of the sources should be a primary source, at least ONE a book and at least ONE a journal article. Be judicious in the use of web resources. Wikipedia, Sparknotes, Encarta and similar sites DO NOT count as acceptable sources. To be handed in to your instructor at the start of the seminar on **December 1.**

Exam

30%

Three-hour examination covering course material. Check timetable for date, time, room.

Formalities

- Seminar attendance is mandatory. Unexcused absences will jeopardize your grade.
- Instructors will consider extensions in the case of medical or personal emergencies, but they MUST be substantiated by documentation and are subject to the instructor's discretion.
- Work handed in late without the instructor's permission will be penalized 5% for the first day and 5% for every two following days.
- Work over 14 days late will NOT be accepted and will AUTOMATICALLY result in 0%.
- To pass the course, you must complete ALL assigned work and receive an average passing mark.

AND A VERY IMPORTANT MATTER

Plagiarism will NOT be tolerated and will AUTOMATICALLY result in a 0% for the assignment. It can lead to a mark on your student file and potentially a mark on your permanent transcript – the one that your future employers will see. DO NOT PLAGIARIZE.

Plagiarism is the use of another writer's thoughts, words or ideas without giving him/her credit. Summarising paraphrases and direct quotes are ways of giving credit to the author. They must be cited in footnote references. When in doubt 1) err on the side of caution; 2) ask your TA; 3) consult Rampolla or another standard history/humanities essay writing guide.

Academic misconduct is a serious offence. The principle of academic integrity, particularly of doing one's own work, documenting properly (including use of quotation marks, appropriate paraphrasing and referencing/citation), collaborating appropriately, and avoiding misrepresentation, is a core principle in university study. Students should consult Section VII, 'Academic Misconduct', in the "Academic Regulations and University Polices" entry in the Undergraduate Calendar, available at brocku.ca/webcal to view a fuller description of prohibited actions, and the procedures and penalties

Course books:

Peter Bowler and Iwan Morus: *Making Modern Science. A Historical Survey*, Chicago/London University of Chicago Press 2005.

Andrew Ede and Lesley Cormack: *A History of Science in Society*, chps. 6-9 (special course packet)

Textbook and course packet can be purchased in the Book Store.

Lecture/Reading Plan

Sept. 8

Introduction

Enlightenment Science

Reading: Bowler/Morus, chp. 1 (Introduction), chp. 2 (Scientific Revolution)

No seminar

Sept. 15

Chemical Revolutions and Electrical Entertainment

Reading: Bowler/Morus, chp. 3 (Chemical Revolution); Patricia Fara, “Stephen Gray and the Charity Boy.” (in reserves)

Seminar: 6.1 Diderot, 6.3 Condorcet

Sept. 22

Energy and Engines

Reading: Bowler/Morus, chp. 4 (Conservation of Energy), chp. 17 (Science and Technology)

Seminar: 6.4 Priestly, 6.5 Lavoisier, 6.6 Franklin

Sept. 29

Sciences of the Earth

Reading: Bowler/Morus, chp. 5 (Age of the Earth), chp. 15 (Science and Religion)

Seminar: 8.1 Rumford, 8.2 Faraday

Oct. 6.

Space and places for science

Reading: Bowler/Morus chp 14 (Organisation of Science), chp 16 (Popular Science)

Seminar: 7.1 Humboldt, 7.2 Cuvier

Oct. 13

NO CLASS – READING WEEK

Oct. 20
Evolution

Reading: Bowler/Morus, chp 6 (Darwinian Revolution)

Seminar: 7.4 Charles Babbage

Essay Outlines due this week!

Oct 27 Film

Seminar: 6.8 Playfair, 7.5 Lyell

Nov. 3
Science and Gender

Reading: Bowler/Morus, chp. 21 (Science and Gender)

Seminar: 7.3 Lamarck, 7.6 Darwin

Nov. 10
Sciences of Life

Reading: Bowler/Morus, chp. 7 (New Biology), chp. 19 (Science and Medicine)

Seminar: 6.7 Herschel, 8.7.2 Curie

Nov. 17
Genetics and Eugenics

Reading: Bowler/Morus, chp 8 (Genetics), chp. 8 (Biology and Ideology)

Seminar: 7.9 Pasteur, 9.1. Mendel, 9.2 Morgan

Nov. 24
Science and violence

Reading: Bowler/Morus, chp. 20 (Science and War)

Seminar: 7.7. Galton, Nuremberg Trials (on sakai)

Dec. 1

Things fall apart

Reading: Bowler/Morus, chp. 11 (Twentieth-century Physics)

Seminar: 8.8 Haber, 9.5 Franck Report, 9.6 Oppenheimer

Essays are due today!

Essay Topics

Consult your instructor if you would like to write your essay on a topic that is NOT listed.

How and why did concepts of scientific expertise change during the eighteenth and early nineteenth centuries?

What role did science play in the culture of the Enlightenment?

What were the roles of science and technology in the agricultural revolution?

What were the roles of science and technology in the industrial revolution?

How did the practice of chemistry change in the eighteenth and nineteenth centuries?

Why were people so interested in geology in the nineteenth century?

How did Victorians interpret the meaning of fossils?

Assess the historical significance of Charles Lyell's *Principles of Geology*.

Discuss the relationship between science and natural theology.

How can the widespread popularity of phrenology in the early nineteenth century be explained?

How useful is it to consider Robert Chambers as a forerunner of Darwin?

How did nineteenth-century contemporaries react to Darwin's ideas?

Why were science institutions so important in the nineteenth century?

How did state interests affect the organization of science? Use historical examples.

What factors were instrumental in the discovery of the energy laws?

How did technologies like the railway and the telegraph affect perceptions of space and time?

What possibilities and limitations did women face when they wanted to participate in science?

How did different social groups participate in science in the nineteenth century?

How did scientific concepts of life change in the nineteenth century?

How did the science of genetics affect perceptions of human beings?

What motivated supporters of eugenics in twentieth century Europe and America?

Discuss the historical significance of Einstein's theory of relativity.

Discuss the effects of war and militarization on scientific and technological research.

Do scientists carry a responsibility for their discoveries, the technologies developed from them and the uses to which they are put? Discuss in regard to the development and deployment of the first nuclear bomb.