

DRAFT

HPS 2503 History of Science Core II: Medieval to Modern

Coordinator: Sandra Mitchell

Spring Term 04-2

Course Requirements

1. Regular attendance and active participation. This will be a significant determinant of grade.
2. Weekly submission of a brief *précis* of the previous week's reading in the light of the previous week's lecture and discussion. Each seminar will begin with a 20 minute discussion of the previous week's material and the document should provide material for this discussion.
3. Four short papers (4 double spaced pages), one on each century 17th, 18th, 19th and 20th century science. Each paper would normally be expected to relate to the material covered in one seminar.
4. (For HPS grad students only) A comprehensive examination consisting of two essay questions chosen from an extensive list and ten brief questions (identify or define the item, relate to historical context, no choice). The examination questions are set in such a way as to test familiarity with the primary sources assigned in the course, as opposed to popular interpretations of the material or recollection of classroom discussion. Students must write passing answers on both essays and on at least seven of the ten brief questions.

Class Format

Each seminar will begin with a 20 minute discussion of the previous week's material, followed by a presentation by a faculty member on the current week's material and a discussion of that material.

Course Outline

Seminar Dates	Topic	Speaker
Jan 8	Introduction	
Jan 15	The Mechanical Philosophy <i>Primary Sources</i> Descartes <ul style="list-style-type: none">• <i>Optics</i>, First Discourse, Second Discourse, Eight discourse• <i>Treatise on Light</i> and other principle objects of the senses	Belot

Feb 12	<p>The Rise of Rational Mechanics</p> <p><i>Primary Sources</i></p> <ul style="list-style-type: none"> • Newton, I. <i>The Principia. A New Translation</i> by I. B. Cohen and A. Whitman. Berkeley, Los Angeles, London: University of California Press, 1999, pp. 433-443. • Blay, M. <i>Reasoning with the infinite</i>. Chicago and London: The University of Chicago Press, 1998, pp. 108-130. <p><i>Secondary Sources</i></p> <ul style="list-style-type: none"> • De Gandt, F. <i>Force and Geometry in Newton's Principia</i>. Princeton: Princeton University Press, 1995, pp. 221-234 	Palmieri
Feb 19	<p><i>Geology, the Life Sciences and Darwin</i></p> <p><i>Primary Sources</i></p> <ul style="list-style-type: none"> • Darwin, C. (1964 [1859]). <i>On The Origin of Species: A Facsimile of the First Edition</i>. Cambridge, MA: Harvard University Press. pp. 1-6; 29-52; 60-67; 80-87; 186-94; 312-317; 346-56; 388-410. • Adam Sedgwick, Presidential Address, <i>Proceedings of the Geological Society of London</i> 1831 • Charles Lyell, <i>Principles of Geology</i>, 1st edition reprint, University of Chicago Press 1990. Vol. 1, Chapters 1 and 5; Vol. 2, Chapters 1-5. <p><i>Secondary Sources</i></p> <ul style="list-style-type: none"> • Rudwick, Martin. <i>The Meaning of Fossils</i> (2nd edition). London, Macdonald and Co.; New York, American Elsevier, 1972. Selections: Chap. 4. • "Introduction" to Charles Lyell, <i>Principles of Geology</i>, 1st edition reprint, University of Chicago Press 1990. Vol. 1 • Rachel Laudan, <i>From Mineralogy to Geology</i>, Chicago, 1987. • Stephen I. Gould, <i>Time's arrow, time's cycle : myth and metaphor in the discovery of geological time</i> , Harvard University Press, 1987. 	Lennox

- <http://www.leeds.ac.uk/classics/resources/poetics/poetbib.html/>.
- Detailed description of the Greek manuscripts of the *Poetics* held at the Bibliothèque Nationale de France in Paris.
- Bibliothèque Nationale, *Catalogue des Incunables* (CIBN), tome I, Bibliothèque Nationale, Paris, date ?, pp. 117-135.
- *Gesamtkatalog der Wiegendrucke*, Band II, pp 552-578.
- Bibliothèque Nationale, *Catalogue général des Imprimés*, Aristote : « Œuvres/Grec et Latin » and « Poetica ».

Secondary Sources

- Charles B. Schmitt, *Aristotle and the Renaissance*, Harvard, Harvard University Press, 1983.
- Charles B. Schmitt, *The Aristotelian Tradition and Renaissance universities*, London, Variorum Reprints, 1984.
- Elizabeth L. Eisenstein, *The Printing Press as an agent of Change : Communications and Cultural Transformations in early modern Europe*, Cambridge/New York, Cambridge University Press, 1979.
- Elizabeth L. Eisenstein, *The Printing Revolution in early modern Europe*, Cambridge/New York, Cambridge University Press, 1993.
- *American Historical Review* Forum , from the *American Historical Review*, vol. 107, issue 1 : How Revolutionary Was the Print Revolution ? This is a a debate between Elizabeth L. Eisenstein and Adrian Johns and it can be found at :
<http://www.historycooperative.org/journals/ahr/107.1/ah0102000084.html>.

	<p><i>Papers</i>, pp. 311-323.</p> <ul style="list-style-type: none"> • Maxwell, James Clerk. "Ether" <i>Papers</i>, pp. 761-775. • Einstein, Albert. "On the Electrodynamics of Moving Bodies" (1905) and "Does the Inertia of a Body Depend on its Energy Content" (1905). In A. Einstein, <i>The Principle of Relativity</i>. Dover 1952. <p><i>Secondary Sources</i></p> <ul style="list-style-type: none"> • J. Stachel, <i>Einstein's Miraculous Year</i>, Princeton University Press, 1998 Part Three: Einstein on the Theory of Relativity, pp.101-121. • J. D. Norton, "Einstein's Special Theory of Relativity and the Problems in the Electrodynamics of Moving Bodies that Led him to it." Prepared for Cambridge Companion to Einstein, M. Janssen and C. Lehner, eds., Cambridge University Press. www.pitt.edu/~jdnorton/for_michel/companion.doc <p><i>Additional Secondary Source</i></p> <ul style="list-style-type: none"> • Segre, E. <i>From X-rays to Quarks</i>. Freeman, 1980 	
Mar 25	<p>The Quantum Theory</p> <p><i>Primary Sources</i></p> <ul style="list-style-type: none"> • Planck, Max. "On the Theory of the Energy Distribution Law of the Normal Spectrum". In D. ter Haar, ed. <i>The old Quantum Theory</i>, Pergamon, 1967. • Einstein, A. "On a Heuristic Point of View About the Creation and Conversion of Light". In D. ter Haar, ed. <i>The old Quantum Theory</i>, Pergamon, 1967. <p><i>Secondary Sources</i></p> <ul style="list-style-type: none"> • J. Stachel, <i>Einstein's Miraculous Year</i>, Princeton University Press, 1998. Part Four Hypothesis. pp. 167-176. <p><i>Additional Secondary Source</i></p>	Norton

Feb 26	<p>The Revolution in Chemistry</p> <p><i>Primary Sources:</i></p> <ul style="list-style-type: none"> • Antione Lavoissier, <i>Elements of Chemistry</i>, Chapters 1 and 2 <p><i>Secondary Sources:</i></p> <ul style="list-style-type: none"> • Clark Glymour "The Atomic Theory" <i>Theory and Evidence</i>, pp. 226-263, Princeton University Press, 1980. 	Glymour
Mar 4	<p>Thermodynamics and statistical mechanics</p> <p><i>Primary Sources</i></p> <ul style="list-style-type: none"> • Carnot, Sadi (1824) Reflexions on the Motive Power of Fire (Extracts) • Joule, J.P (1847) On Matter, Living Force and Heat • Thompson, William (1853) "On the Dynamical Theory of Heat". <i>Philosophical Magazine</i> • Maxwell, James Clerk (1860) "Illustrations of the Dynamical Theory of Gases" <i>Philosophical Magazine</i> <p><i>Secondary Sources</i></p> <ul style="list-style-type: none"> • Brush, Stephen G. <i>The kind of motion we call heat : a history of the kinetic theory of gases in the 19th century</i>. American Elsevier, 1976. 	Earman & Norton
	SPRING BREAK	
Mar 18	<p>19th C Theories of Electromagnetism and the Relativity Theory</p> <p><i>Primary Sources</i></p> <ul style="list-style-type: none"> • Maxwell, James Clerk. "On Faraday's Lines of force", 1855-56, In <i>The Scientific Papers of James Clerk Maxwell</i>, pp. 155-6 • Maxwell, James Clerk. "A Dynamical Theory of the Electromagnetic Field", 1864, (Part I only) <i>Papers</i>, pp. 526-36 • Maxwell, James Clerk. "On Action at a Distance". 	Norton

