In this course we survey changes and developments in European science (natural philosophy) from earliest times through the Scientific Revolution of the 17th century. Lectures, discussions, and readings are concerned with the origin(s), transmission, and development of scientific and philosophical ideas, and the emergence of new intellectual, cultural, and linguistic communities and practices. Particular emphasis is given to changing views and conceptions of the traditional triad: 'Science, Nature, Man.' There will be a One Hour In-Class Essay Exam in addition to a Take-Home Last Essay. Please note that attendance is mandatory; participation expected. Students may choose to write an extra-credit Optional Research Essay; please see the Study Guide and elsewhere at this WebSite for details. Office hours for Professor Hatch are Tuesday, 5.00-6.00 pm, Thursday, 1.00-2.00 pm, and By Appointment, 226 Keene-Flint Hall. Students are strongly encouraged to take full advantage of Office Hours for consultation. Telephone: 392.0271 (24h machine); E-Mail: ufhatch@ufl.edu. In addition, required materials are also found at this WebSite. It is highly recommended that students 'Bookmark' this page and consult the contents at least once each week. The Teaching Bulletin can be important: http://www.clas.ufl.edu/users/rhatch/pages. Course Details: 'What is Expected - What do I Need to Know?'
**Required Reading** is taken from the following books and from this WebSite:
Gator Textbooks, Creekside Mall, 3501 SW 2nd Avenue, Suite D: 374.4500; for further information see their WebSite: [http://www.gatortextbooks.com](http://www.gatortextbooks.com)

<table>
<thead>
<tr>
<th>Author</th>
<th>Title</th>
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</thead>
<tbody>
<tr>
<td>Hatch, Robert A.</td>
<td><em>Study Guide for the History of Science</em> (Cost-free at this WebSite)</td>
</tr>
<tr>
<td>Henry, John</td>
<td><em>The Scientific Revolution &amp; the Origins of Modern Science</em></td>
</tr>
<tr>
<td>Kuhn, Thomas S.</td>
<td><em>The Copernican Revolution</em></td>
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<tr>
<td>Kuhn, Thomas S.</td>
<td><em>The Structure of Scientific Revolutions</em></td>
</tr>
<tr>
<td>Lindberg, David C.</td>
<td><em>The Beginnings of Western Science</em></td>
</tr>
<tr>
<td>Toulmin, S. &amp; J. Goodfield</td>
<td><em>The Fabric of the Heavens</em></td>
</tr>
<tr>
<td>Westfall, Richard S.</td>
<td><em>The Construction of Modern Science</em></td>
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</table>

**Recommended Books at the Library:**

<table>
<thead>
<tr>
<th>Author</th>
<th>Title</th>
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<tbody>
<tr>
<td>E. A. Burtt</td>
<td><em>The Metaphysical Foundations of Modern Physical Science</em></td>
</tr>
<tr>
<td>Herbert Butterfield</td>
<td><em>The Origins of Modern Science</em></td>
</tr>
<tr>
<td>Alan Debus</td>
<td><em>Man and Nature in the Renaissance</em></td>
</tr>
<tr>
<td>Edward Grant</td>
<td><em>Physical Science in the Middle Ages</em></td>
</tr>
<tr>
<td>G.E.R. Lloyd</td>
<td><em>Aristotle: The Growth and Structure of His Thought</em></td>
</tr>
<tr>
<td>Carolyn Merchant</td>
<td><em>The Death of Nature: Women, Ecology, and the Scientific Revolution</em></td>
</tr>
<tr>
<td>Londa Schiebinger</td>
<td><em>The Mind Has No Sex?: Women in the Origins of Modern Science</em></td>
</tr>
<tr>
<td>Stephen Shapin</td>
<td><em>The Scientific Revolution</em></td>
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This course makes available primary source materials on the WWW, most notably English Books On-Line (EEBO) and the astonishing French site, GALLICA. Other electronic sites will also be provided. To start, students are encouraged to spend time at my 'Search Site' to become familiar with related Library Resources, Search Engines, and Primary Source Sites. Further particulars will be discussed in class.
The Scientific Revolution: Secondary Sources (Hatch)

The Scientific Revolution: Primary Sources (Hatch)

Scientific Revolution - Journals

JSTOR - {Includes journals of historical interest, including searchable PT of the Royal Society, 1664 - }

Other recommended volumes are found at Library West & the Science Library; this WebSite has ample bibliography.

Evaluation

All required work is announced on this syllabus. Attendance is mandatory and all course requirements must be completed to receive class credit. Please note that this is a demanding course. It involves substantial reading and writing, and hence, careful preparation and planning. Because a schedule is provided in advance, absences and arrangements for late work must be approved in advance. Please plan your course and semester schedules and other commitments with care. A basic course rule is called Mantra One: When in doubt: Consult the syllabus; ask questions; read ahead. Finally, students are expected to read and understand several items (concerning examinations, writing papers, secondary readings, etc.) available at my posted WebSite. This WebSite contains useful items (bibliography, WebLinks, Search Engines, etc.) as well as practical guides on writing Blue Book Exams, University level essays, and guidelines Reading & Writing & Studying. Students are responsible for reading this material early in the semester. Again, it is highly recommended that students consult the material regularly: http://www.clas.ufl.edu/users/rhatch/pages

Evaluation of course requirements takes five forms:
1. Attendance is mandatory; please see University Guidelines on this important issue. NB: Completion of correlated readings (prior to the lecture) and comprehension of lecture material is required. Please note that the Study Guide is self-paced; students are expected to follow the topic content and study materials appropriate to the lectures and the required readings. Please note that all course requirements must be met to receive course credit. Late work will not be accepted without an appropriate explanation in writing.

2. Participation in class discussion and activities is expected. There may be unannounced quizzes and attendance may be monitored {Approximately 20%}

3. **Mid-Term Exam**: 2 October 2012 (30%). Written in-class 'Blue-Book' Essay Exam. Please see this WebSite for guidelines in preparing for the exam. **How to take a Blue-Book Exam.**

4. **Take-home Essay**: *Nota Bene*: Due before 12.00 Noon, Friday, 7 December 2012, in the Main History Department Office (025 Keene-Flint Hall). The Take-Home Essay (c. 50%) is a written take-home essay limited to 1000 words, the equivalent of five {5} typed pages, double spaced, typed {No Binders Please: Kindly Staple Securely}. Please see the WebSite for suggestions in preparing and writing this essay. Students should retain a photocopy of their work for backup purposes. If you wish to have your Last Essay returned, kindly supply a large manila envelope (9x12) with the appropriate postage and address. I will return your Essay and final course grade by post. Essays will not otherwise be returned or retained.

5. **Optional Paper**: 15-page research essay; due no later than 12.00 Noon, Friday, Week XIV. The Optional Essay provides extra credit and can add as much as one letter to the final course grade. The paper is non compulsory; no one is penalized for not choosing this option. The Optional Paper allows interested students to pursue a course topic in greater detail or to identify an area not treated in this general survey course. As a practical matter, students should consider carefully if they have sufficient time to do a proper job. The Optional Paper should represent a solid and rewarding effort. The topic for the Optional Paper must be approved by the instructor. Please consult the Study Guide and this WebSite for details regarding topic selection, approval, submission dates, bibliography, and suggestions about research
and writing. All topics must be approved and guidelines must be followed. As always, students should take advantage of Office Hours for discussion and consultation.

**Further Details - Required Reading:** 'What is Expected - What do I Need to Know?' - A Fair Question!

### PART I: ANCIENT & MEDIEVAL NATURAL PHILOSOPHY

#### WEEK I: 22 - 24 August

Th: Plotting Our Course

Egyptian and Babylonian Science: A Sketch

*Readings:* Kuhn, Copernican, Foreword; Begin Toulmin, Introduction & Chap. 1; Acquaint yourself with all required books. Lindberg, Chapters 1 & 2; Visit WebSite. Begin with Teaching Resources; then read: Undergraduate Guide to the History of Science.


*Discussion Topic:* Science, Myth, Language

<table>
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<tr>
<th>WEEK II: 27 - 31 August</th>
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<tr>
<td>T: Egyptian and Babylonian Science - Continued</td>
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<tr>
<td>Th: Early Greek Cosmology: The Pre-Socratics</td>
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*Readings:* Toulmin, Chapter 2; Lindberg, Chapter 2, continue; Continue WebSite Teaching Resources & Hatch - History of Science Study Guide

*Discussion Topic:* Truth & Reality?
WEEK III: 4 - 7 September [Labor Day, 3 September]

T-Th: Aristotle: The Aristotelian Synthesis
Readings: Lindberg, Chapter 3; Toulmin, Chapter 3; Kuhn, Copernican, Chapter 1-2.
Continue WebSite Teaching Resources & Hatch - History of Science Study Guide

Discussion Topic: Plato & Aristotle

WEEK IV: 10 - 14 September

T: Aristotle - Continued
Th: Ptolemy & the Almagest (Mathematical Synthesis)
Readings: Toulmin, Chap. 3 & 5; Kuhn, Copernican Chap. 2; Lindberg, Chapter 5
Finish WebSite Teaching Resources & Continue: Hatch - History of Science Study Guide

Discussion Topic: Astronomy & Cosmology

WEEK V: 17 - 21 September

T-Th: From Ancient to Medieval Science: An Overview
Readings: Lindberg, Chapters 8 & 9; Toulmin, Chap. 6.
Continue: Hatch - History of Science Study Guide

Discussion Topic: Transmission Problems

WEEK VI: 24 - 28 September

T: Medieval and Renaissance Astronomy
Readings: Kuhn, Copernican, Chapter 4; Lindberg, Chapters 11, 12, 14.
Continue: Hatch - History of Science Study Guide
Th: REVIEW SESSION - Come prepared for Q&A & Review Discussion.
Again: Please see WebSite guidelines to prepare for this exam. **How to take a Blue-Book Exam.** **Discussion Topic:** Discussion REVIEW: Review All Required Texts; Review All Notes. Write out questions you think might be asked. Study Time: Again: Please see the WebSite for guidelines and suggestions in preparing for this exam. **How to take a Blue-Book Exam.**

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**WEEK VII: 1 - 5 October**

T: MID-TERM EXAM: **Thursday** {Bring Blue Examination Booklet(s)}: **Readings:** Review & study readings and notes; Review future Readings; Continue Toulmin; Begin Henry.

Th: NO CLASS; Begin new readings.

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**PART II: THE SCIENTIFIC REVOLUTION**

**WEEK VIII: 8 - 12 October**


Th: The Scientific Revolution: An Overview
**Readings:** Toulmin, Chapter 7; Begin J. Henry.
Continue: **Hatch - History of Science Study Guide**;
Read: **Hatch - The Scientific Revolution: Paradigm Lost?**
Begin: **Hatch - The Scientific Revolution HomePage**

**Discussion Topic:** Continuity, Revolution; Internal, External

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**Copernican Perspectives - Take a Peek!**
WEEK IX: 15 - 19 October:

T-Th  Copernicus & the Copernican Disturbance - {Gee Nick! No Revolution?}
Readings: Review Lindberg, Chapters 11 & 12; Kuhn, Copernican, Chapter 5 (again); begin Chapter 6; Continue J. Henry. Continue: Hatch - History of Science Study Guide; then Read & Review: The Big Guys - The Scientific Revolution

Discussion Topic: Revolutionary Points of Detail

WEEK X: 22 - 26 October

T-Th  Tycho Brahe, Observer, Cosmologist & Bon Vivant
Readings: Kuhn, Copernican, Chapter 6; Continue J. Henry; Continue: Hatch - History of Science Study Guide
See: Hatch - The World Systems
See: Tycho Brahe - Official Site

Discussion Topic: World Systems, Birds, Rabbits, etc.

WEEK XI: 29 October - 2 November

T-Th  Kepler & the New Astronomy {A Keplerian Revolution?}
Readings: Westfall, Chapter 1; Continue J. Henry; Visit & Study: Hatch: The World Systems & Kepler's 'Laws'
Continue: Hatch - History of Science Study Guide

Discussion Topic: Were These Guys Geniuses?

WEEK XII: 6 - 8 November

T-Th  Galileo & the New Astronomy {A Galilean Revolution?}
Readings: Reread: Kuhn, Copernican, pp. 117-118, 219-226; Toulmin, Chapter 8-9; Kuhn, Copernican, Chapter 7; finish J.
<table>
<thead>
<tr>
<th>WEEK XIII: 13 - 16 November</th>
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<tr>
<td>T-Th - Descartes &amp; the Mechanical Philosophy</td>
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**Discussion Topic:** The Mechanical Philosophy:
- Contact, Impact, Pressure - not "Force" or "Action-at-a-Distance" - Foreshadowing Newton

**Readings:** Begin Westfall, Chapters 1 & 2; Begin Kuhn, *Structure*.

Continue: **Hatch - History of Science Study Guide**

**Discussion Topic:** The Geometrical Spirit and Mechanical Worldviews

<table>
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<tr>
<th>WEEK XIV: 20 November</th>
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<tbody>
<tr>
<td>T - Isaac Newton &amp; the 'Newtonian Synthesis'</td>
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</table>

**Readings:** Toulmin, Chapter 9-10; Westfall, Chapters 7 & 8
Web-Bio(s), **Hatch - Sir Isaac Newton**;
Re-read Kuhn, *Structure* {then re-think Kuhn's *Structure*}.
Read & Review all required readings;
Continue: **Hatch - History of Science Study Guide**

**Discussion Topic:** Mechanism, Materialism, Force - action-at-a-distance - How does Kuhn fit here?

**NO CLASS 21-25 November: Thanksgiving –**
Have a Great Turkey-Day!
WEEK XV: 26 - 30 November
T – Thomas S. Kuhn – All About Revolution(s)
Read & Review all required readings & notes.
Th – More Regarding Isaac Newton & Thomas S. Kuhn

WEEK XVI: 3 - 5 December
T – Open Discussion, Notably on Thomas S. Kuhn - Then, Open Q&A, Review
Remember the Beginning: 'What is Expected - What do I Need to Know?' - A Fair Question!

Nota Bene: Last Take-home Essay Due Before:
12:00 Noon, Friday, 7 December 2012,
History Department Main Office (025 Keene-Flint Hall)
Last Take-Home Essay Question

Please staple your typewritten exam (no binders please).
Include your name and SSN on the cover page and (as standard procedure) the Course Title, Number, and the Date. If you wish to have your essay returned, please attach a Large (9x12) Clasp Envelope with appropriate postage and your address. I will arrange to have your essay and final course grade delivered by a Special Federal Agent.
Please Note: Essays will not otherwise not be returned or retained.

Questions? Please e-me: ufhatch@ufl.edu
Opps - Almost forgot! What is Gravity? Answer

BACK - HOME