# ANCIENT, MEDIEVAL AND RENAISSANCE SCIENCE

## READINGS

Texts for the course are:


Copies of Lindberg and Dear are available in the bookstore. Alternatively, if you wish to purchase a copy, they may be found online through various search services, such as Addall.com, Bookfinder.com, Abebooks.com and Alibris.com. Both have been published in new editions recently; I do not care if you purchase (probably at reduced prices) and use the earlier editions.

In addition, you should note that there are shorter readings that will be the focus of discussion during the weekly sections; these are also available in the D2L site for this course. You are asked to print these materials so that you can bring them to discussion section on the assigned weeks.

## SCHEDULE OF CLASS MEETINGS

**Unit I: The Early Greeks and Science**

**Background Reading for the Unit:** Lindberg, ch. 1-2

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
<th>Discussion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Week 1 (Aug 23, 25)</td>
<td>Introduction to the Course; Pre-Greek Science; The Presocratics</td>
<td><strong>Selection of Presocratic Fragments</strong>: Thales, Anaximander, Pythagoras/Pythagoreans, Xenophanes, Heraclitus, Parmenides, Empedocles, Protagoras</td>
</tr>
<tr>
<td>Week 2 (Aug 30, Sept 1)</td>
<td>Science, Technology, and Classical Drama; Sophists and Socrates</td>
<td><strong>Aristophanes, “The Clouds”</strong></td>
</tr>
<tr>
<td>Week 3 (Sept 6, 8)</td>
<td>Scientific Certainty: Plato and the Forms</td>
<td><strong>Plato, Republic VII</strong></td>
</tr>
</tbody>
</table>

**Unit II: Hellenistic Science**

**Background Reading for the Unit:** Lindberg, ch. 3-7a

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
<th>Discussion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Week 4 (Sept 13, 15)</td>
<td>Orality, Literacy, and Science; Aristotle: Taxonomy and Teleology as a Basis for Science</td>
<td><strong>Aristotle, Physics II.1-3, 8; IV.8; VII.1, 5; De caelo I.2, 3, 8; II.13-14</strong></td>
</tr>
<tr>
<td>Week 5 (Sept 20, 22)</td>
<td>The Individual and Science in Hellenistic Culture; Greek and Roman Medicine</td>
<td>**Hippocratic texts: “Tradition in Medicine” and Galen, “On the Sects for Beginners”</td>
</tr>
<tr>
<td>Week 6 (Sept 27, 29)</td>
<td>Ancient Mathematics and Culture; Ptolemy: Mathematics and Physics in the Heavens</td>
<td><strong>Ptolemy, Almagest I.1-7, IX.2</strong></td>
</tr>
</tbody>
</table>
Week 7 (October 4, 6)  Ptolemy: Mathematics and Physics in the Heavens (cont.); Early Christian Approaches to Science  
**Discussion: Lynn White, Jr., “Historical Roots…”**

---

**Tuesday, October 11 1:30 p.m. – 2:45 p.m. -- Midterm Examination**

**Unit III: Medieval Science**

**Background Reading for the Unit: Lindberg, ch. 7b-14**

Week 8 (October 13)  Technology and Medieval Culture

Week 9 (October 18, 20)  Islam and Islamic Science; The Twelfth-Century Renaissance: Revitalization of the Ancient Tradition and its Application to Medieval Culture  
**Discussion: Averroes, “The Decisive Treatise, determining the Nature of the Connection between Religion and Philosophy” and Bernard of Chartres, Cosmographia**

Week 10 (October 25, 27)  University Science and Society in the Middle Ages; God and Mammon: Theology, Nature, Money, Heresy and their Consequences  
**Discussion: Dante, Inferno, cantos XIV-XVI and Jean de Meun, Romance of the Rose, sections 77-78, 82-84, 87-88; Aquinas, “Faith and Reason”**

Week 11 (November 1, 3)  The Language of Fourteenth-Century Physics: Natural Philosophy without Nature  
**Discussion: Buridan, “The Impetus Theory of Projectile Motion,” “On the Cause of Acceleration of Free-Falling Bodies,” “On the Compatibility of the Earth’s Diurnal Motion with Astronomical Phenomena.”**

**Unit IV: The Renaissance of Science**

**Background Reading for the Unit: Dear**

Week 12 (November 8, 10)  The Renaissance of Science; Copernicus and the Reform of Astronomy  
Dear, Introduction, ch. 1-2  
**Discussion: Giovanni Pico della Mirandola, “Oration on the Dignity of Man”; Copernicus, De revolutionibus, letter to the pope and I.5-9**

Week 13 (November 15, 17)  The Reformation and Science: Theology and the Early Readers of Copernicus; The Reformation and Science: Johannes Kepler [Dear, ch. 4]

Week 14 (November 22)  The Organic Universe [Dear, ch. 3]

**November 24**  
No Class – Thanksgiving

---

* Please note that in the lecture schedule that follows, I have not adopted the order or organization of Dear’s book, nor is there an identity between the topics he covers and those I will cover. You may find that it is easier to begin reading the book sequentially, and if you cover all the chapters by the end of the course, you will be fine, if a little temporally maladjusted.
COURSE REQUIREMENTS

1. One mid-course examination, written in class (October 11). This will constitute 25% of the final grade. The format of the exam will be an essay with some objective identification questions.

2. Almost every week, we will discuss primary source readings – that is, texts written during the period under investigation – related to the history of science. As noted above, these sources are available in the D2L site for this course and should be printed out, read before the discussion section date, and brought to section. For four of these texts, you must prepare a short (2-3 typewritten page; 500-750 word) analytic essay on one of the sources assigned for the day.

There is some latitude in your selection of essay topics. However, you must write one essay in each of the four units noted above in the schedule of class meeting dates [August 23 – September 8, September 13 – October 6, October 13 – November 3, November 8 – December 8]. In addition, you may notice from surveying the readings that there are several parallel issues that we will be pursuing in the course, and in particular in the weekly discussion sections. Among them:

- Literature and science [Greek tragedy, Bernard of Chartres, Dante, Jean de Meun, Campanella]
- Utopian literature [Plato, Campanella]
- Faith and reason [Dante, Aquinas, Galileo]
- Physical theory [Aristotle, Buridan]
- Astronomical arguments & literature [Ptolemy, Bernard of Chartres, Copernicus, Kepler]
- Overriding comparison of the structures of sources in scientific literature [dialogue, poetry, epistolary, philosophical, epitome, questionary]

Particularly as we move into the second and subsequent units, you may wish to structure your essays around these parallel issues, comparing, for example, Plato’s conception of the role of science in his ideal society with Campanella’s rather different vision, or perhaps a comparison of the Greek and medieval conceptions of nature and its investigation as seen through the literature of the period.

Because these essays are intended as preparation for the discussion, they are to be submitted at the beginning of the discussion section on the day for which the text was assigned. No late papers will be accepted. Together, these four essays will constitute 40% of the final course grade.

The composition of these analytical essays may be unfamiliar to many students. We encourage you to plan far enough ahead that you can read the source thoroughly, have time to reflect on its central issues, and organize, write and revise the essay prior to its submission. You may also bring a draft to the instructors for preliminary consideration and advice about revisions. For the first unit only, students may revise graded essays and resubmit them. Resubmissions should be made within one week of receipt of the graded essay.
Please be aware of the seriousness of plagiarism. It is imperative that you acknowledge all sources. Generally, the essays for this course will require no further sources beyond those listed in the syllabus. But this limited base of readings does not free you from the obligation to acknowledge materials. Plagiarism is defined as the unacknowledged use of specific ideas, arguments, or extended passages from any source. It is an extremely serious academic offense (to say nothing of the moral issues involved); you may wish to consult the Student Code [studentconduct.ou.edu] for penalties.

On the other hand, the need to acknowledge sources does not mean that you must provide elaborate footnotes or endnotes in essays. Most, if not all, of the citations should be from the materials assigned for the course; in such cases, a simple parenthetical citation [e.g. (Dante, p. 103)] will suffice. Should you refer to materials beyond those required for the course, you will need to make a full identification in a bibliography at the end.

3. The discussion is also an opportunity to review materials covered previously. I may, from time-to-time, give a very short quiz over the readings for the current week during this part of the class. Performance on these quizzes will become a factor when cumulative grades fall between two letter grades.

4. A comprehensive final examination, again written in class (Thursday, December 15, 1:30-3:30 p.m.), of the same format as the midterm. This will constitute the remaining 35% of the course grade.

OTHER INFORMATION

1. Any student in this course who has a disability that may prevent him or her from fully demonstrating his or her abilities should contact me personally as soon as possible so that we can discuss accommodations necessary to ensure full participation and facilitate your educational opportunities.

2. Make-up examinations will be accepted only in cases where valid reasons (such as illness) pertain. If such an occasion arises, it is advisable to consult with me before the due date.

3. Office hours: Physical Sciences 604, Monday 11:00-12:00, Thursday 4:00-5:00, and by appointment. Russell Hunter, the teaching assistant for this course, will also hold regularly scheduled office hours, Wednesday 10:00am-12:00am, Thursday 8:00am-9:00am, or by appointment.