

## UMBC UGC New Course Request: ANCS 330 Ancient Science and Technology

Date Submitted:

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### COURSE INFORMATION:

course number(s)	ANCS 330
formal title	Ancient Science and Technology
transcript title (≤24c)	Ancient Sci & Tech
prerequisite	One ANCS and/or ARCH course and/or permission of instructor
credits	3
max. repeat credits	0
grading method(s)	x Reg (A-F) x Audit X Pass-Fail

### PROPOSED CATALOG DESCRIPTION:

This course will survey the birth and development of ancient science and technology. Topics may include scientific reasoning and methodology; mathematics, geometry, and astronomy; anatomy and medicine; construction, engineering, and mechanical technology. Historical background – political, economic, social, cultural, and religious – provides insights into related fields of political science, psychology, and ethical philosophy.

### RATIONALE FOR NEW COURSE:

This course is intended to provide students in Ancient Studies an advanced introduction to a field critical to their understanding of the ancient world. The course is also meant to provide the general student population with the ancient background to modern sciences and technology.

The course fits into the department's curriculum in that it fulfills one objective of relating aspects of the ancient world to contemporary interests and issues. The course is offered at the 300 level primarily because of the complexity of the topics and difficulty of the required readings. The prerequisite is appropriate in order to ensure that students have some fundamental knowledge relevant to the course.

Earlier versions of this course have been taught as:

HONR 300G - Spring 2009

ANCS 350H/HONR 300C - Fall 2005

ANCS 350H/HONR 300C – Spring 2004

ANCS 350H/HONR 300D – Spring 2003

The proposed course is likely to be taught once every two years. P/F is a standard alternative for courses regularly taught.

**ATTACH COURSE OUTLINE (mandatory):**

**Ancient Science and Technology**

**Course Description and Goals**

This course will present the major scientific and technological advances made by the ancient Greeks and Romans. Those advances in such diverse fields as medicine and biology, mathematics and geometry, geography and astronomy, became the foundations of intellectual thought in both the Latin west and in the Arabic east.

The names of such natural philosophers as Thales and Pythagoras are familiar to all of us, but what can we say with certainty about the exact contributions of Hippocrates to medical practice or theory? What did Aristotle contribute to scientific methodology and to biology? What distinguishes Euclid's presentation of geometry from earlier (and later) studies? How is it possible that Archimedes made revolutionary contributions to the diverse fields of mathematics, physics, hydrostatics, and astronomy?

We will study these discoveries and developments within the historical context of the ancient world. That background – political, social, religious, and economic – will provide us with insights into developments in political science, sociology, anthropology, psychology, and ethical philosophy. We will examine traditional methods of education, the establishment of intellectual “schools” such as Plato's Academy, and the origins and growth of scientific institutions such as the Museum and Great Library at Alexandria. We will also consider those cultural and religious factors that promoted or impeded developments in science.

Our texts will include translations of treatises written by major scientists and mathematicians of the Greek and Roman world. We will also study archaeological evidence for advances in metallurgy and engineering. We will investigate the workshops at ancient Sardis where gold and silver were refined as early as the sixth century BCE. And we will examine a calendar mechanism from the first century BCE that was operated by more than thirty toothed wheels of different diameters.

Our survey will include the transmission of the advances achieved by the Greeks and Romans to the Latin medieval west and to the Arabic east.

Our goal throughout is an educationally challenging, intellectually stimulating, and thoroughly rewarding experience.

**Required Texts**

Aristotle. *The Pocket Aristotle*. Edited with an Introduction and Prefatory Notes by Justin D. Kaplan. Translated under the Editorship of Justin D. Kaplan. Selections from *Psychology, Physics, Politics, Nicomachean Ethics, Metaphysics, and Poetics*. New York: Pocket Books, 1958. ISBN 0-671-46377-2

*The First Philosophers: The Presocratics and the Sophists*. Translated with commentary by Robin Waterfield. Oxford: Oxford University Press, 2000. ISBN 0-19-282454-6

Longrigg, James. *Greek Medicine: From the Heroic to the Hellenistic Age – A Source Book*. New York: Routledge, 1998. ISBN 0-415-92087-6

Plato. *The Dialogues of Plato* [Apology, Crito, Euthyphro, Phaedo, Protagoras, Meno, Symposium, Gorgias, Part III]. With an Introduction by Erich Segal. New York: Bantam, 1986. ISBN 0-553-21371-7

Sarton, George. *Ancient Science Through the Golden Age of Greece*. New York: Dover, 1993 [1952]. ISBN 0-486-27495-0

Sarton, George. *Hellenistic Science and Culture in the Last Three Centuries B.C.* New York: Dover, 1993 [1959]. ISBN 0-486-27740-2

## Tentative Syllabus

### **Week 1 Introduction: The Ancient World**

### **Week 2 The Greek Language**

#### **Homer and Hesiod**

Sarton, I, "The Dawn of Greek Culture: Homer and Hesiod," pp. 130-153 [Sarton, I = Sarton, *Ancient Science Through the Golden Age of Greece*]

### **Week 3 Hesiod: Cosmogony and Theogony**

#### **The Dark Ages and the Ionian Revolution**

Sarton, I, "*Xenophanes of Colophon*," pp. 179-180  
Waterfield, *The First Philosophers*,  
"Xenophanes of Colophon," pp. 22-31  
Sarton, I, pp. 160-178 [up to *Cleostratus of Tenedos*]  
Waterfield, "Introduction," pp. xi-xxxiii  
Waterfield, "The Milesians," pp. 3-21

### **Week 4 Egypt and Greece**

#### **Elements and Atoms**

Sarton, I, "*Egyptian Interlude – Greek Technicians*," pp. 180-193; "Pythagoras," pp. 199-217  
Sarton, I, "*Empedocles of Agrigentum*" and "The Atomists," pp. 246-256;  
"Democritus of Abdera," p. 277  
Waterfield, "Empedocles of Acragas," pp. 133-163  
Waterfield, "Democritus of Abdera," pp. 164-193

### **Week 5 Traditional Education**

#### **The Sophists**

Sarton, I, "*The Sophists*," pp. 256-259  
Waterfield, "Protagoras of Abdera," pp. 205-221  
Plato, *Dialogues*, "Protagoras," pp. 137-191  
Waterfield, "Euthydemus and Dionysodorus of Chios," pp. 277-284  
Waterfield, "Gorgias of Leontini," pp. 222-240  
Plato, *Dialogues*, "Gorgias, Part III" pp. 289-340  
Waterfield, "Prodicus of Ceos," pp. 241-250

### **Week 6 Herodotus**

#### **Athens - The Ideal City?**

Sarton, I, "*The Historians: Herodotos*," pp. 303-314  
Sarton, I, "*Thucydides of Athens*," pp. 314-326

### **Week 7 Medicine – Hippocrates, Thucydides, The Plague, and Asklepios**

### **Week 8 Anaxagoras and Others**

#### **Socrates**

Sarton, I, "*Anaxagoras of Clazomenae*," pp. 241-245;  
Waterfield, "Anaxagoras of Clazomenae," pp. 116-132

Waterfield, "Zeno of Elea," pp. 69-81  
Sarton, I, "Socrates of Athens," pp. 259-272  
Plato, *Dialogues*, "Symposium," pp. 233-286  
Plato, *Dialogues*, "Euthyphro," pp. 45-61

**Week 9 The Fourth Century: Plato and the Academy**

**Aristotle and the Peripatetics at the Lyceum**

Plato, *Dialogues*, "Apology," pp. 3-26  
Sarton, I, pp. 467-502, 509-519, 522-525, 529-545  
Aristotle, *The Pocket Aristotle*:  
*Politics*, pp. 276-338

**Week 10 Aristotle and Theophrastus**

**Exploration**

Aristotle, *Poetics*, pp. 340-379  
Sarton, I, pp. 546-561, 565-574

**Week 11 Schools of Philosophy and Life**

**Alexander and the Founding of Alexandria**

**Alexandria: Museum and Library**

Sarton, I, pp. 584-605  
Sarton, II, pp. 158-164  
[Sarton, II = Sarton, *Hellenistic Science and Culture  
in the Last Three Centuries B.C.*]  
Sarton, II, pp. 11-34, 141-157

**Week 12 Geometry and Astronomy**

**Archimedes of Syracuse and Apollonios of Perge**

Sarton, II, pp. 35-67  
Sarton, II, pp. 68-98, 117-128

**Week 13 Physics and Technology**

Sarton, II, pp. 68-98, 117-128

**Week 14 Eratosthenes of Cyrene**

**Ctesibios and Philon**

**Anatomy and Medicine**

Sarton, II, pp. 99-116  
Sarton, II, pp. 343-350  
Sarton, II, pp. 129-140

**Week 15 Rome**

**Hipparchos**

**The Wider World**

Sarton, II, pp. 219-233; 350-378  
Sarton, II, pp. 284-288, 296-302, 415  
Sarton, II, pp. 315-342  
Sarton, II, pp. 418-430; 350-360

**Week 16 Catch-up and Conclusions**

**Final Exam**

**Grading**

Quizzes	10%
Short Papers	20%
Research Paper	20%
Test 1	20%
Class Participation	10%

Final Examination 20%

Written work will include a number of one-page papers, each no longer than one page, elucidating the significant facts and concepts in the required reading and due on the date when the reading is to be discussed in class. Having completed those readings before class and having reflected on the material, you will be prepared to raise pertinent questions, to express your own ideas and interpretations, and even to challenge my views. Consequently, you will make the class an enriching experience for all.

Students come to this course from a wide variety of majors and every student has individual interests. One way in which this course attempts to be truly interdisciplinary is to give each student the opportunity to pursue an individual interest on a research paper. So, for example, a biology major might explore some aspect of biology in the ancient world. In that research paper, you will be expected to support your insights and conclusions with specific examples and arguments. In our discussions of the development of ancient thought, we will have noted the critical importance accorded to precise definitions and exacting argument. Your paper should reflect how much you have learned both from your own research and from assigned readings and class discussions in this course. You should make clear the historical and intellectual context of the topic you have chosen, and make good use of your creative imagination and of your abilities in critical thinking.

“By enrolling in this course, each student assumes the responsibility of an active participant in UMBC’s scholarly community in which everyone’s academic work and behavior are held to the highest standards of honesty. Cheating, fabrication, plagiarism, and helping others to commit these acts are all forms of academic dishonesty, and they are wrong. Academic misconduct could result in disciplinary action that may include, but is not limited to, suspension or dismissal. To read the full Student Academic Conduct Policy, consult the UMBC Student Handbook or the UMBC Policies section of the UMBC Directory.”