

GENERAL STUDIES COURSE PROPOSAL COVER FORM

Course information:

Copy and paste current course information from Class Search/Course Catalog.

College/School College of Liberal Arts and Sciences Department/School _____ SILC _____

Prefix: SLC Number: 394 Title: Greek Science and Society Units: 3

Course description: The rapid development of scientific knowledge can be disorienting. What causes people this rapid development? And what effects does it have on the society in which it occurs? "Ancient Greek Science and Society" explores these questions in the context of the society in which philosophy developed the branches of study that today we call "science."

Is this a cross-listed course? Yes If yes, please identify course(s): GRK 394

Is this a shared course? No If so, list all academic units offering this course: _____

Note- For courses that are crosslisted and/or shared, a letter of support from the chair/director of each department that offers the course is required for each designation requested. By submitting this letter of support, the chair/director agrees to ensure that all faculty teaching the course are aware of the General Studies designation(s) and will teach the course in a manner that meets the criteria for each approved designation.

Is this a permanent-numbered course with topics? No

If yes, all topics under this permanent-numbered course must be taught in a manner that meets the criteria for the approved designation(s). It is the responsibility of the chair/director to ensure that all faculty teaching the course are aware of the General Studies designation(s) and adhere to the above guidelines. _____ (Required)

Requested designation: Historical Awareness-H Mandatory Review: No

Note- a separate proposal is required for each designation.

Eligibility: Permanent numbered courses **must** have completed the university's review and approval process. For the rules governing approval of omnibus courses, contact Phyllis.Lucic@asu.edu.

Submission deadlines dates are as follow:

For Fall 2018 Effective Date: October 1, 2017

For Spring 2019 Effective Date: March 10, 2018

Area(s) proposed course will serve:

A single course may be proposed for more than one core or awareness area. A course may satisfy a core area requirement and more than one awareness area requirements concurrently, but may not satisfy requirements in two core areas simultaneously, even if approved for those areas. With departmental consent, an approved General Studies course may be counted toward both the General Studies requirement and the major program of study.

Checklists for general studies designations:

Complete and attach the appropriate checklist

- [Literacy and Critical Inquiry core courses \(L\)](#)
- [Mathematics core courses \(MA\)](#)
- [Computer/statistics/quantitative applications core courses \(CS\)](#)
- [Humanities, Arts and Design core courses \(HU\)](#)
- [Social-Behavioral Sciences core courses \(SB\)](#)
- [Natural Sciences core courses \(SQ/SG\)](#)
- [Cultural Diversity in the United States courses \(C\)](#)
- [Global Awareness courses \(G\)](#)
- [Historical Awareness courses \(H\)](#)

A complete proposal should include:

- Signed course proposal cover form
- Criteria checklist for General Studies designation being requested
- Course catalog description
- Sample syllabus for the course
- Copy of table of contents from the textbook and list of required readings/books

It is respectfully requested that proposals are submitted electronically with all files compiled into one PDF.

Contact information:

Name Michael A Tueller E-mail mike_tueller@asu.edu Phone 602-501-4011

Department Chair/Director approval: (Required)

Chair/Director name (Typed): Nina Berman Date: 1.10.18

Chair/Director (Signature): 

Arizona State University Criteria Checklist for

HISTORICAL AWARENESS [H]

Rationale and Objectives

Recent trends in higher education have called for the creation and development of historical consciousness in undergraduates now and in the future. History studies the growth and development of human society from a number of perspectives such as—political, social, economic and/or cultural. From one perspective, historical awareness is a valuable aid in the analysis of present-day problems because historical forces and traditions have created modern life and lie just beneath its surface. From a second perspective, the historical past is an indispensable source of identity and of values, which facilitate social harmony and cooperative effort. Along with this observation, it should be noted that historical study can produce intercultural understanding by tracing cultural differences to their origins in the past. A third perspective on the need for historical awareness is that knowledge of history helps us to learn from the past to make better, more well-informed decisions in the present and the future.

The requirement of a course that is historical in method and content presumes that "history" designates a sequence of past events or a narrative whose intent or effect is to represent both the relationship between events and change over time. The requirement also presumes that these are human events and that history includes all that has been felt, thought, imagined, said, and done by human beings. The opportunities for nurturing historical consciousness are nearly unlimited. History is present in the languages, art, music, literatures, philosophy, religion, and the natural sciences, as well as in the social science traditionally called History.

The justifications for how the course fits each of the criteria need to be clear both in the application tables and the course materials. The Historical Awareness designation requires consistent analysis of the broader historical context of past events and persons, of cause and effect, and of change over time. Providing intermittent, anecdotal historical context of people and events usually will not suffice to meet the Historical Awareness criteria. A Historical Awareness course will instead embed systematic historical analysis in the core of the syllabus, including readings and assignments. For courses focusing on the history of a field of study, the applicant needs to show both how the field of study is affected by political, social, economic, and/or cultural conditions AND how political, social, economic, and/or cultural conditions are affected by the field of study.

Revised October 2015

Proposer: Please complete the following section and attach appropriate documentation.

ASU--[H] CRITERIA			
THE HISTORICAL AWARENESS [H] COURSE MUST MEET THE FOLLOWING CRITERIA:			
YES	NO		Identify Documentation Submitted
<input checked="" type="checkbox"/>	<input type="checkbox"/>	1. History is a major focus of the course.	Syllabus, textbooks
<input checked="" type="checkbox"/>	<input type="checkbox"/>	2. The course examines and explains human development as a sequence of events influenced by a variety of factors.	Syllabus
<input checked="" type="checkbox"/>	<input type="checkbox"/>	3. There is a disciplined systematic examination of human institutions as they change over time.	Syllabus
<input checked="" type="checkbox"/>	<input type="checkbox"/>	4. The course examines the relationship among events, ideas, and artifacts and the broad social, political and economic context.	Syllabus
		THE FOLLOWING ARE NOT ACCEPTABLE:	
		• Courses that are merely organized chronologically.	
		• Courses which are exclusively the history of a field of study or of a field of artistic or professional endeavor.	
		• Courses whose subject areas merely occurred in the past.	

Course Prefix	Number	Title	General Studies Designation
SLC/GRK	394	Ancient Greek Science and Society	H

Explain in detail which student activities correspond to the specific designation criteria. Please use the following organizer to explain how the criteria are being met.

Criteria (from checklist)	How course meets spirit (contextualize specific examples in next column)	Please provide detailed evidence of how course meets criteria (i.e., where in syllabus)
1	The course covers significant aspects of the social and cultural history of the Greek world (encompassing much of the eastern Mediterranean) during the Classical (479–323 BCE) and Hellenistic (323–31 BCE) periods. This is not a history of science in this period, but rather a history of the Greek people and how they both affected and were affected by the science of their times.	Syllabus: course description; learning outcomes 1 & 2
2	The development of Greek society in this course is primarily seen to be affected by science, broadly speaking. But the course also situates science as a cultural phenomenon, and shows how it is affected by philosophy, writing trends, contact with other cultures, and changing political systems.	Syllabus: course description; learning outcomes 1 & 2; schedule, esp. Aug. 21, 23, 30; Sep 4, 18; Oct 16, 23; Nov 8, 13, 15, 20
3	The institution most consistently examined is the scientific class, along with more concrete institutions such as the Museum and Library of Alexandria and ancient schools such as the Academy (founded by Plato), the Lyceum (founded by Aristotle), and the Garden (founded by Epicurus). Our best surviving evidence for these institutions is written matter (both authored within, and in response to, those institutions), though this is accompanied by a notable artifact, the Antikythera Mechanism. All this evidence is analyzed by matching theory, practice, and perception found within the evidence, tempered with	Syllabus: course description; learning outcomes 1, 2, 3, 5; schedule. On the Academy, see Sep 4; on the Lyceum, see Sep 6; on the Garden, see Oct 25 & 30. On the Antikythera Mechanism, see Nov 8.

	an understanding of what methods of observation and constraints applied at the time.	
4	The entire idea of the course is to explore the relationships between social and scientific ideas. In this mix political and religious ideologies are also situated prominently.	Syllabus: course description; learning outcomes 1 & 2; schedule passim

Course catalog description

Course Description: Covers topics of immediate or special interest to a faculty member and students.

SLC 394
Ancient Greek Science and Society
Fall 2018
TTh

Instructor: Mike Tueller LL 415C
480-965-8700 Office hours:
mike_tueller@asu.edu

It is easiest, and most effective, to contact me by e-mail. Please allow 24 hours for a response.

Textbooks: (required)

Early Greek Science: Thales to Aristotle, by G. E. R. Lloyd (W. W. Norton, 1974, revised edition).

ISBN 9780393005837.

Greek Science after Aristotle, by G. E. R. Lloyd (W. W. Norton, 1975). ISBN 9780393007800.

All the above texts are available at the bookstore.

Course website: In addition to the readings mentioned above, the course website has a great many links to required reading, especially primary sources. It will also be updated as needed with handouts and helps for the class. You will need to be familiar with it. If you have any problems accessing the website, please e-mail me and let me know.

Description: This course does not endeavor to be a comprehensive history of Greek science (an interesting topic in its own right). Rather, it selects particular areas of Greek science (especially astronomy, physics, mathematics, and medicine) and explores their relationships with the cultural sphere of the Greeks. It considers questions such as:

- What about Greek culture made it amenable to the development of science?
- How were cultures other than the Greeks involved in what we label “Greek science”?
- How did changes in Greek government (traditional aristocracy, democracy, and empire—both as rulers and subjects) affect scientific work?
- How was the writing of science affected by Greek standards of expression? How did writing affect science itself?
- What questions did Greek scientists ask? What questions (perhaps—but not exclusively—some that now seem obvious) were not asked, and why?
- How did the Greek people react to the rapid scientific progress taking place among them?
- How was science reflected in Greek literature and art?

One thing this course emphatically does *not* do is ask the question “Why did the Greeks fail to reach our level of scientific achievement?” or “What did they get right?” The class proceeds on the assumptions (easily seen when one thinks of the present) that no obvious criterion distinguishes between fruitful and unfruitful lines of research before that research is actually done, and that negative outcomes can be just as revelatory as positive ones. Thus, for instance, refinements in astronomical models remain important even if those models are not heliocentric, and astrology is given attention because the Greeks understood it along the same lines as astronomy and other clearly scientific fields.

Student Learning Outcomes:

Upon successful completion of this course, students will be able to:

- Explain how scientific thinking developed among the ancient Greeks, with reference to the surrounding societal forces that affected it, including contact with non-Greek systems of thought and changes in governmental structure. This explanation will situate ancient science in an ancient context, rather than judging it by its compatibility with today’s ideas.
- Explain how changes in scientific thinking and its discoveries in turn affected ancient society and its cultural artifacts, values, and functions.
- In the above explanations, take into account the limitations of surviving historical evidence, including evaluating the possible implications of undiscovered facts.
- Demonstrate an understanding of Aristotle’s four causes, and their relevance to scientific explanation.
- Demonstrate an understanding of standards for argumentation, including how and why they differ between scientific disciplines.

Course goals and methods: The primary goal of this course is an understanding of the interaction of science and society across ancient Greek history. Of course, this understanding will not be possible without some grounding in actual facts, so the course’s secondary goal is knowledge of the facts of the past, including both scientific propositions (and their justifying theories) and historical events. Both types of learning will be accomplished through reading, lecture, and discussion. Your “knowledge of facts” will then be evaluated by objective portions of tests and quizzes, and, to a lesser extent, by the other, more subjective requirements in the course. Your “understanding and explaining” skills will be evaluated through your on-line discussion, your final paper, and essay questions on examinations.

Components of your grade:

<u>Activity</u>	<u>Value</u>
Discussion participation	20%
Quizzes	10%
Midterm examination	15%
Final paper/project	25%
<u>Final examination</u>	<u>30%</u>
Total	100%

Now, what does this all mean?

1. Discussion participation. While I hope our course meetings will be more than just lecture, this grade does not refer to participation in class discussion, but rather to participation in the Blackboard discussion forum. After each Thursday on which there is a quiz, I will inaugurate a new discussion. You should participate in that discussion, either by creating a new entry or by responding to someone else’s, at least once before the beginning of class on the next quiz day. I’m not going to set specific standards for what “substantively” means here, because I don’t want you to be counting words or other such nonsense. Just do your best, and if you’re not quite making it to the point where you’ll get credit, I’ll let you know. But the honest truth is that I’m not trying to make this requirement particularly difficult: just participate at least once

a week, don't worry about it, and you should be fine. This requirement is not intended to grade these items for content; for that, see requirement 4, below.

2. Quizzes. Quizzes will be given approximately every Thursday. (See the schedule below.) Quizzes will be short (5 minutes) and will test knowledge of the material for the week. I may give some quizzes in addition to those listed on the schedule.

3. Midterm examination. A one-hour midterm will be given on 4 October. This midterm will be administered during class time and in the usual classroom. The midterm will consist of short questions about facts, reading passages for longer analysis, and essay questions. If you cannot take the midterm at the designated date and time, please let me know well in advance; I will then determine if and how it can be made up.

4. Final paper/project/presentation. A 300-level course should include some project that shows you can work with the course's material in a rigorous way. Traditionally, this is a paper. If you are a fan of the traditional academic paper, go ahead and write one: it should be between 2500 and 4000 words; guidance on writing a paper for me is posted on the course website. On the other hand, if your academic style is less traditional, I am happy to accept other projects or class presentations. Just talk to me at some point before October 4th (the sooner the better!), and we can arrange something of similar scope and rigor. Regardless of which option you choose, the paper/project/presentation must be done and submitted to me by November 13th at 11 AM. Unless otherwise arranged, you should submit this through the Blackboard submission utility. If Blackboard submission is not possible, or if you just like turning in a physical object, talk to me about how to arrange that.

5. Final examination. The final examination will be administered in our usual classroom from --- to --- on --- December. It will be similar in format and content to the midterm. I will not and cannot make exceptions to the time or place of this exam; you are obligated to be present for it on the ---th. Please make any vacation plans accordingly.

Due dates: This syllabus features dates and times when things are due. In most cases, I cannot accept late work for credit. If you must miss a quiz or an exam, please inform me as soon as possible. In the case of school-sponsored activities or emergencies, we should be able to work out a solution if you speak to me in a timely manner.

Grading scale:

More than 100%	A+	80%–82.99%	B-
93%–100%	A	77%–79.99%	C+
90%–92.99%	A-	70%–76.99%	C
87%–89.99%	B+	60%–69.99%	D
83%–86.99%	B	Less than 60%	E

As you can see, I award an A+ only for more than 100%. Is this even possible? It is, but only by carefully shepherding extra credit points. I never *plan* to offer any extra credit, but invariably some extra credit opportunities pop up during the semester. If you're doing your work carefully and paying attention in class, chances are that some will come your way.

Caveat discens: The culture you are studying is foreign to us in many ways. In understanding a culture so different from our own, you will learn new ways of thinking and organizing your understanding of the world. I find this possibility very exciting, but I will admit that it can also be deeply unsettling. Since Greek culture is so different, it certainly cannot be expected that it will be supportive of the values that typify the western U.S. In some respects the Greeks are more “conservative,” such as in their attitudes toward aristocracy, war, and women; in others they are more “liberal,” especially in their attitudes toward religion, sexuality, and permissible speech. The truth is, the labels “conservative” and “liberal” scarcely apply here, because the Greeks divided up the world of ideas very differently, but my point is that study of this very different culture may bring you into contact with concepts that you may find offensive. It is never my goal to offend, but it would be irresponsible of me to avoid all potentially offensive material, especially when some of it strikes to the core of Greek culture.

If you judge that the material of this class may be excessively challenging for you, I urge you to discuss your concerns with me as soon as possible—either when those concerns arise, or, even better, at the beginning of the semester. I promise to listen sympathetically and work to resolve your concerns. In the vast majority of cases, a resolution can be found relatively easily. If not, then this course may not be right for you; it is better to discover this sooner, rather than later.

That said, I can say from long experience teaching this material that I do not often encounter problems: people seeking titillation usually come away disappointed, and those fearing it usually come away relieved that it was not so bad as they had feared. But I think it is fair to give warning. Getting an education is all about coming to know things you haven’t known before, so the student can never predict the results in advance.

Academic Dishonesty: All work in this class that is submitted for a grade must be entirely your own work. In the case of quizzes and tests, you are not permitted to seek or accept help from any person, text, or other source while taking the test or quiz. In preparing your reading, you may work with others, but any written material that you turn in (including Blackboard discussion posts) must still be entirely your own work. If you have any questions, please ask me. I subscribe to the university’s policy on academic integrity, as follows.

Academic honesty is expected of all students in all examinations, papers, and laboratory work, academic transactions and records. The possible sanctions include, but are not limited to, appropriate grade penalties, course failure (indicated on the transcript as a grade of E), course failure due to academic dishonesty (indicated on the transcript as a grade of XE), loss of registration privileges, disqualification and dismissal. For more information, see <http://provost.asu.edu/academicintegrity>.

Policy on gadgets in the classroom: A normal class meeting in this course will consist of discussion, and discussion requires your full engagement. I find this easiest if everyone brings to the table nothing other than their notes and books. The days are long past, however, when the words “notes” and “books” were used exclusively to refer to things on paper. My own material is mostly on a tablet, for instance, and one of your books for this class is an e-book. My official policy, then, is that during a regular class meeting, your devices, whatever they are, should be used just for taking notes and referring to your notes and the course texts. Please

refrain from other activities—especially viewing websites and playing games—as these are very distracting, and may result in loss of discussion points. Audible cellphone rings, text messaging, and (Hermes forbid!) actual phone conversations are also prohibited.

Additionally, any use of electronic devices of any kind during a quiz or examination is strictly forbidden and may result in a score of *zero* for the quiz or examination.

Other disruptive behavior: Late arrivals are penalized as diminished participation, and may be additionally penalized if they disrupt class. Eating loudly is also disruptive. I won't go on; it would be impossible to enumerate all the ways in which a class may be disrupted—I expect you to be paying attention to what you're doing and how it affects the people around you. Disruptive behavior will be penalized in the area of participation, and, if the disruption is serious, it may result in an additional penalty to the overall grade for the course.

Violent and threatening behavior: All incidents and allegations of violent or threatening conduct by an ASU student (whether on-or off campus) must be reported to the ASU Police Department (ASU PD) and the Office of the Dean of Students. If either office determines that the behavior poses or has posed a serious threat to personal safety or to the welfare of the campus, the student will not be permitted to return to campus or reside in any ASU residence hall until an appropriate threat assessment has been completed and, if necessary, conditions for return are imposed. ASU PD, the Office of the Dean of Students, and other appropriate offices will coordinate the assessment in light of the relevant circumstances.

Sexual harassment: Title IX is a federal law that provides that no person be excluded on the basis of sex from participation in, be denied benefits of, or be subjected to discrimination under any education program or activity. Both Title IX and university policy make clear that sexual violence and harassment based on sex is prohibited. An individual who believes they have been subjected to sexual violence or harassed on the basis of sex can seek support, including counseling and academic support, from the university. If you or someone you know has been harassed on the basis of sex or sexually assaulted, you can find information and resources at <http://sexualviolenceprevention.asu.edu/faqs/students>.

Absence policy: As noted above, absences figure into your grade as part of “participation”: if you are absent, your participation grade will be diminished accordingly. This penalty can be avoided, and any missed work made up, in the following circumstances:

- In case of illness or emergency. (Documentation will be required, and notification must be timely.)
- In order to accommodate religious practices in accordance with ACD 304-04 “Accommodations for Religious Practices.”
- For university-sanctioned events in accordance with ACD 304-02 “Missed Classes Due to University-Sanctioned Activities.”

Tardiness: If at all possible, please come to class on time; late arrivals can be disruptive. Naturally, if you miss part of a class, or if you disrupt it and make others' participation more difficult, you may expect that your participation grade will be diminished accordingly.

Disability Accommodations: Students who feel they will need disability accommodations in this class but have not registered with the Disability Resource Center (DRC) should contact DRC immediately. The DRC Tempe office is located on the first floor of the Matthews Center Building. DRC staff can also be reached at: (480) 965-1234 (V) or (480) 965-9000 (TTY). For additional information, visit: www.asu.edu/studentaffairs/ed/drc.

A schedule follows. The schedule is subject to modification during the semester, but this represents a close approximation of my expectations for the course.

Schedule

Some reading materials are abbreviated in this schedule:

EGS = Lloyd, *Early Greek Science*

GSA = Lloyd, *Greek Science after Aristotle*

All other reading material is accessed through links in the “Reading” area of the course website.

The entries for most days below include reading, which should be done *before* the class meeting for that day. It also includes study questions, which should form the basis for your thinking as you do the reading. Class discussion will reference those questions, but will not be limited to them: if you think of other questions as you read, please feel free to raise them, either in class or in the Blackboard discussion forums. You may also email me or drop by office hours and start a discussion with me personally.

Th 16 Aug **Topic:** Administrative necessities, introduction

T 21 Aug **Topic:** The Seven Sages

Reading: Diogenes Laertius 1.40–42; Plato, *Protagoras* 342a (“Well, then, I said”) – 343c (“as it seems to me”); *The Wisdom of the Seven Sages* T35

Study questions: These are some background information about, and the sayings of, the “Seven Sages” of the Greeks. The word that is translated “sage” here is *sophos*, which means “wise” or “smart.” If these are the sayings of smart people, what sort of things do smart people do? What would the Greeks, in this time before the flowering of their philosophy and science, consider to be “smart” things?

Th 23 Aug **Quiz**

Topic: The Pre-socratics

Reading: Aristotle, *Metaphysics* 1.3–5; EGS pp. 1–23

Study questions: What were the key developments of pre-socratic philosophy? Lloyd makes some arguments for why those developments happened among the Greeks specifically. Do you find these persuasive? Can you think of other possible explanations? Which factors were key—in other words, if those factors had not been in place, the developments would not have happened?

T 28 Aug **Topic:** Change

Reading: EGS pp. 36–49; Parmenides, D8; Melissus, D10; Gorgias, *On Nonbeing*

Study questions: Parmenides' and Melissus's denial of the possibility of change flies in the face of common sense. Is this fact a sufficient refutation of their position? Does the development of their argument represent a dead end that must be abandoned in order for science to develop, or is it a move forward toward the development of science?

Th 30 Aug **Quiz**

Topic: An early popular reaction

Reading: Aristophanes, *Clouds*

Study questions: Aristophanes' *Clouds* represents a comedic reaction to new developments in advanced education. Not all of these developments are what we would today call "scientific." To what degree is the ancient reaction justified? Are the objections to (proto-)scientific developments in any way different from the objections to developments in other areas, such as rhetoric?

T 4 Sep **Topic:** Astronomy through Plato

Reading: EGS pp. 80–85; Plato, *Timaeus* 27d ("Now first of all") – 47e ("for the same ends")

Study questions: What is the connection between astronomy and religion? Does Plato's thinking represent a step toward what we would today call "science"? Or away from it?

Th 6 Sep **Quiz**

Topic: Causes

Reading: Herodotus preface; Thucydides 1.23 (selection); Aristotle, *Physics* 2.3; EGS pp. 105–108

Study questions: Compile a list of "why" questions of all kinds. (Do not think only of scientific questions: use any question that starts with "why.") Poll your friends. What answers do you get to those questions? Do they fit Aristotle's four causes?

T 11 Sep **Topic:** Motion in Aristotle's physics

Reading: Aristotle, *On the Heavens* 1.2–3; Aristotle, *Physics* 4.8; EGS pp. 109–115

Study questions: Prove that Aristotle's physics is wrong. You are not allowed to use numbers or measurement. You are not allowed to set up unusual limiting conditions, because you are studying nature, and therefore want to work only with what may naturally happen. Is this difficult to do? How closely does Aristotle's physics align with your everyday experience of the world?

Th 13 Sep **Quiz**

Topic: Writing science: an astronomical example

Reading: *EGS* pp. 85–98; Aratus, *Phaenomena* 1–62; Tueller & Macfarlane, “Hipparchus and the Poets”

Study questions: Aratus’s *Phaenomena* was the most popular astronomy textbook of its day, replacing Eudoxus, Aratus’s prose scientific source. What does this say about expectations for scientific writing? Did Attalus subscribe to those expectations? Hipparchus clearly had a different idea: what difference did his conception make? What is the relationship between scientific work and scientific writing—in other words, which features of each causes which features of the other?

T 18 Sep **Topic:** Institutional science before and after Alexander

Reading: *EGS* pp. 125–138; *GSA* pp. 1–7

Study questions: After Alexander’s conquests, the social setting of science changed. What impact was that change likely to have on scientific practice?

Th 20 Sep **Quiz**

Topic: The astronomy of Aristarchus and Ptolemy

Reading: *GSA* pp. 53–57, 113–131

Study questions: Come to class prepared to take any of three positions in a debate between the heliocentric and geocentric models of the universe. You will be called upon to a) advocate for the heliocentric model, b) advocate for the geocentric model, or c) act as a moderator, pointing out when improper assumptions have been made, or when insufficient attention has been paid to “preserving the appearances.”

T 25 Sep **Topic:** Astrology

Reading: Ptolemy, *Tetrabiblos* 1.1–5, 1.9, 2.1–2, 3.1

Study questions: You are familiar from the last class with Ptolemy as an astronomer. Today’s text shows him to be an astrologer as well—if he is really its author. Argue for or against the Ptolemaic authorship of the *Tetrabiblos*. Be careful to avoid anachronism!

Th 27 Sep Catch-up day

T 2 Oct Exam review

Th 4 Oct **Midterm exam**

T 9 Oct Fall break; no class scheduled

Th 11 Oct **Topic:** Zoology

Reading: Aristotle, *On the Generation of Animals* 1.1–2, 1.17–20, 1.22, 2.1 (selections), 4.1–3 (selections)

Study questions: The parts of this work that I have selected for today are largely those that do not rely heavily on observation. (FYI, Aristotle records a great many zoological observations elsewhere. They are not all accurate, but they are usually not bad.) What techniques does he use to reason about the things he cannot directly observe?

T 16 Oct **Topic:** Medicine

Reading: EGS pp. 59–62 (“... abandon theorising altogether”); GSA pp. 147 (“One case where he was misled ...”) – 153; Posidippus epigrams 95–101 AB; *Greek Anthology* 11.117; Theocritus, *Idyll* 11

Study questions: Compare the development of medical science to that of astronomy. What made medicine more or less difficult to pursue with precision? Why would someone study medicine? What did people in general think of physicians? As healers, how did physicians stack up against less scientific medical options?

Th 18 Oct **Quiz**

Topic: Pharmacology

Reading: Nicander, *Theriaca* 493–714; John Scarborough, “Nicander’s Toxicology I: Snakes”

Study questions: Nicander’s poem was quite popular in antiquity. Why?

T 23 Oct **Topic:** Geography

Reading: Eratosthenes on the Measure of the Earth; Strabo 2.1.20–37, 8.7–8; Callimachus, Hymn 1 (to Zeus)

Study questions: What did the Greeks understand by “geography”? How was the work of geographers reflected in the way they thought about their world?

Th 25 Oct **Quiz**

Topic: Lucretius, part 1

Reading: Lucretius, *On the Nature of Things* 1–3

Study questions: Does physics fit well into the poetic format? What is the purpose of this poem?

T 30 Oct **Topic:** Lucretius, part 2

Reading: Lucretius, *On the Nature of Things* 4–6

Study questions: What sorts of explanations does Lucretius accept for the causes of physical phenomena? Is Lucretius sponsoring a “scientific” view of the world, in the modern sense?

Th 1 Nov **Quiz**

Topic: Euclid's *Elements*

Reading: Reviel Netz, "Proclus' Division of the Mathematical Proposition into Parts: How and Why Was It Formulated?" (If you find this article a bit difficult, you may skip the long middle section, section 3 "The Practice.")

Study questions: Although Euclid's scheme for each of the various propositions in his *Elements* varies somewhat, Netz concludes that they generally follow the same pattern. Why would Euclid do this?

T 6 Nov **Topic:** Mathematics in epigram

Reading: Eratosthenes, *Letter to Ptolemy*; Archimedes, "The Cattle Problem"; the mathematical epigrams of book 14 of the *Greek Anthology*

Study questions: What is the point of putting mathematics problems into poetic form? What role is played by the difficulty of solving these problems in an age before the invention of algebra as we know it today? Geometry, unlike number problems, was rarely expressed in poetic form; why did Eratosthenes choose an epigram for his geometric solution?

Th 8 Nov **Quiz**

Topic: The Antikythera Mechanism

Reading: Jo Marchant, "Decoding the Antikythera Mechanism, the First Computer"; Michael Wright, "The Antikythera Mechanism"

Study questions: Why was the Antikythera mechanism made? Does it deserve the title it is sometimes given, of "the world's first computer"? In what respect is it a break with past practice, or an advance similar to modern computational devices? How do you think a typical ancient Greek would have reacted to it?

T 13 Nov **Final paper/project is due by 11 AM.**

Topic: Archimedes: the legend of a military genius

Reading: Chris Rorres, "The Siege of Syracuse"

Study questions: Today Archimedes is known primarily for his surviving mathematical treatises and a few simple engineering devices (few of which he actually invented, though he may have formalized thought about them), but the sources you read here were the foundation of his ancient reputation. What can we learn from these about how the ancients thought about scientific genius? What was important to them?

Th 15 Nov **Quiz**

Topic: Hypatia, an ancient woman scientist

Reading: Michael A. B. Deakin, "Hypatia and Her Mathematics"

Study questions: What do we know about Hypatia? From what we know about her, what can we understand was considered important about her in antiquity and in the Middle Ages? What does this tell us about women in science in antiquity? Do we think differently today?

T 20 Nov **Topic:** Science across borders

Reading: Ehsan Masood, *Science and Islam: A History* (2008), ch. 4

Study questions: What role does international cooperation play in science? What about international competition? As you answer these questions, think about the entire class, not just the reading for today.

Th 22 Nov Thanksgiving; no class scheduled

T 27 Nov Catch-up day

Th 29 Nov Final exam review

Final examination date and time to be determined

Q:
127
G7
L51

EARLY
GREEK SCIENCE
Thales to Aristotle

G. E. R. LLOYD

Senior Tutor of King's College, Cambridge



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GREEK SCIENCE
AFTER ARISTOTLE

G. E. R. LLOYD

*Senior Tutor of King's College,
Cambridge*

1973
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