

SGBN 101: The Shape of the World

Fall 2021

MWF 10:40-11:45

Goldspohn 22

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Office: Seybert 102 (floor below advisors)

Office Hours: 9:15-10:35 MWF

Course Description

This course is about some of the biggest questions that human beings ask themselves: How is the world constructed? How does it work? What is the place of human beings in it? And how can we know whether the answers we give to those questions are correct? Focusing primarily on the Greek, Roman, and modern European tradition, with some attention to other world regions, we will trace the origins of modern empirical science and the shift from the ancient earth-centered worldview to something like our modern view of the solar system.

Course Objectives

Course-specific objectives:

- Compare assumptions in diverse traditions and account for their persuasiveness
- Articulate different traditions in the study of nature, their similarities and contrasts with each other and with the modern scientific approach
- Show understanding, through discussion and writing, of the fundamental elements of the knowledge of nature in the traditions examined in this course

Objectives for Science Gen Ed designation:

- Identify some of the fundamental principles and laws in the physical and/or life sciences.
- Explain how scientists ask and answer questions.
- Apply the methods of scientific inquiry.

Objectives for Global Understanding designation:

- Describe the implications of global interdependence including its effects.
- Explain how various cultures contribute to the development of a multicultural world.
- Explain local, national, and global identities and commitments with increasing awareness of their environment.

Required Course Readings

Please buy, rather than rent, all course texts in hard copy, to facilitate underlining and note-taking. The additional cost will be rewarded with greater understanding and easier preparation for class discussion and exams.

Patricia Curd (ed.), *A Presocratics Reader* (ISBN: 9781603843058)

Thomas Kuhn, *The Copernican Revolution* (ISBN: 9780674171039)

Pliny the Elder, *Natural History: A Selection* (ISBN: 9780140444131)

Plato, *Timaeus and Critias* (ISBN: 9780140455045)

Lucretius, *The Nature of Things* (ISBN: 9780140447965)

Additional readings, which should be printed and brought to class, are available on Blackboard and marked as follows: (**)

Student Assessment

Courses in the Shimer Great Books Program are heavily discussion-based and student-driven. Accordingly, class participation counts for a much higher proportion of student grades than in most courses: 50%. Written work of various kinds will account for the remaining 50%.

Class participation presupposes careful and thorough preparation and serious intellectual involvement in class discussion. Students should come to class not only having read the text through, but having underlined, taken notes, and scanned over the marked text at least one additional time after the initial reading. On the basis of such preparation, students should be prepared for an intensive, text-focused discussion.

My expectation for class participation is that every member of class will be able to contribute with remarks and citations that are on-topic and reflect solid preparation for class. A student who meets that baseline will receive a grade in the **B range** for their participation portion. Students whose contribution is notably lacking—for instance, those who speak very little, who give no evidence of having done the reading carefully, who consistently change the topic in a disruptive way, or whose primary contributions are jokes or personal anecdotes—will receive a participation grade in the **C or D range**. Students who distinguish themselves through some particular service—such as consistently contributing new topics that shape the discussion, serving as a resource for navigating the text, or making a special effort to draw in quieter classmates—will qualify themselves for a participation grade in the **A range**.

The baseline condition for class participation is of course physical presence in class. Absences not only affect the individual student, but the entire group, and the same is true of habitual lateness. Punctual attendance should be regarded as mandatory. Lateness will count against a student's participation for that session, and in extreme cases will be treated as the equivalent of an absence. An increasing number of absences carries with it increasing consequences, which are as follows:

1-2 absences No grade penalty, in recognition of our shared human frailties. (If students miss fewer than two classes, however, then in cases where a student is at the threshold between two grades, the professor will go with the higher one.)

3-5 absences A half letter grade is deducted from the student's final grade for each absence; this penalty may be lifted by doing an absence make-up for each missed class.

6-8 absences For each absence, the student *must* complete an absence make-up (described below) to avoid failing the course, and a half letter grade penalty is imposed on the student's final grade which *cannot* be made up.

9 absences Automatic failure of the course.

In order to make up for an absence, students must write a paper summarizing and reflecting on the day's reading (2 *full* pages, double spaced) or schedule a meeting of at least 15 minutes to discuss the reading with the professor. Absence make-ups must be completed **within two weeks** of the absence being made up.

Written work will take the form of 4 short papers (5% each, 20% total), 2 reports on in-class labs (2.5% each, 5% total), 2 long-term astronomical observation activities (7.5% each, 15% total), and a take-home final exam (10% of final grade). The following gives a basic overview of each assignment; more detailed descriptions, including grading criteria, will be provided closer to the time they are due.

The *short papers* will cover a variety of topics: one creative account of the universe in the style of the Presocratics, two that address aspects of scientific method in assigned texts and labs, and one that looks at multiculturalism in the history of science. Each essay must be 2-3 *full* pages in length and must focus on the texts and/or labs; you must use multiple direct quotations from the course texts per page to support your claims.

A *lab report* provides an account of the experiment carried out, with all relevant measurements included. While there is no specific length requirement for these reports, it is unlikely that you can do a good job in less than a full double-spaced page. For in-class lab, these assignments are due by the beginning of the next class session; for longer-term labs, the due date is listed on the class schedule.

The *take-home exam* will be made up of short-answer and essay questions collaboratively written by the members of the class.

All written assignments must be turned in on Blackboard by the due date listed on the course schedule below; in case of technical difficulties with Blackboard, you may submit the paper via email for the sake of meeting the deadline, but the paper must be posted on Blackboard as soon as possible in order to receive comments and a grade. Students submit ***all written work*** in Microsoft Word (.doc or .docx) format; in case of technical difficulties submitting in the required format, you may use another format for the sake of meeting the deadline, but must resubmit in the required in order to receive comments and a grade. Papers turned in within 24 hours of the deadline will receive a 5% grade penalty on the assignment; papers turned in within a week of the deadline will receive a 10% grade penalty, with an additional 10% penalty for each additional week (or portion of a week) the paper is late. There is no opportunity for rewrites in this class.

Note on Institutional Policies

Please note that the college-wide policy on plagiarism holds for this class and that student assignments may be run through plagiarism-detection software at the professor's discretion. Plagiarism is a very serious academic and ethical offence that can lead to failure of the assignment or course—or, after multiple instances, expulsion from college. Please consult the Student Handbook for more details of the plagiarism policy. All other institutional policies apply equally, including those related to accommodations for students with learning disabilities or differences and Title IX protections. More details on those policies are available in the Student Handbook, and students are encouraged to approach the professor with any questions or concerns they may have.

Class and Reading Schedule

*This calendar provides the schedule for assignments and readings for our time together this semester. Students should be aware that the schedule may change. All students will be alerted as soon as possible via email and Blackboard announcement. **Failure to check email regularly is no excuse for missing these updates.***

Wednesday	August 25	Course introduction and syllabus
Friday	August 27	<i>Presocratics Reader</i> , ch. 2 “The Milesians” and 4 “Xenophanes of Colophon” (pp. 13-22, 31-38)
Monday	August 30	<i>Presocratics Reader</i> , chs. 6 “Parmenides of Elea,” 7 “Zeno of Elea,” and 9 “Anaxagoras of Clazomenae” (pp. 55-72, 101-108)
Wednesday	September 1	<i>Presocratics Reader</i> , ch. 5 “Heraclitus of Ephesus” and ch. 8 “Empedocles of Acragas,” intro, sections 47-55 and 101-120 (pp. 39-54, 73-74, 83-89, 95-99)
Friday	September 3	<i>Presocratics Reader</i> , chs. 3 “Pythagoras and Early Pythagoreanism” and 10 “Leucippus and Democritus” (pp. 23-30, 109-126)
Monday	September 6	NO CLASSES—Labor Day
		Paper #1 due Tuesday, September 7 by noon
Wednesday	September 8	Lucretius, <i>On the Nature of the Universe</i> , Book 1 “Matter and Space” (pp. 10-37)
Friday	September 10	Lucretius, <i>On the Nature of the Universe</i> , Book 5 “Cosmology and Sociology” (pp. 129-166)
Monday	September 13	Plato, <i>Timaeus</i> , 17a-43a (pp. 3-32)
Wednesday	September 15	Plato, <i>Timaeus</i> , 43b-68d (pp. 33-67)
Friday	September 17	Plato, <i>Timaeus</i> , 68e-92c (pp. 67-99)
Monday	September 20	NO CLASS—Paper #2 due by class time
Wednesday	September 22	Kuhn, <i>Copernican Revolution</i> , start ch. 1 (pp. 1-25)
Friday	September 24	Kuhn, <i>Copernican Revolution</i> , finish ch. 1 (pp. 25-44)
Monday	September 27	Lab: Constructing an Astrolabe Introduction of Sky Watching Labs
Wednesday	September 29	Kuhn, <i>Copernican Revolution</i> , ch. 3 (pp. 79-99)
Friday	October 1	Aristotle, selections from <i>On the Heavens</i> (**)
Monday	October 4	Aristotle, selection 1 from <i>Physics</i> (**)
Wednesday	October 6	Aristotle, selection 2 from <i>Physics</i> (**)
Friday	October 8	Archimedes, “On the Equilibrium of Planes” (**)
Monday	October 11	Lab: Lever
Wednesday	October 13	Archimedes, “On Floating Bodies” (**)
Friday	October 15	Lab: Floating Bodies

Monday	October 18	Fall Break—NO CLASS Hippocrates selections 1 and 2 (**) Galen selection (**)
Wednesday	October 20	
Friday	October 22	
Monday	October 25	Pliny, <i>Natural History</i> , Bk II “Astronomy” (pp. 10-41) Paper #3 due Sunday, October 24, by noon Pliny, <i>Natural History</i> , Bk VII “Man” (pp. 74-107) Needham, “Fundamental Ideas of Chinese Science” (**), pp. 127-168 (up to heading “Element Theories”; skim tables)
Wednesday	October 27	
Friday	October 29	
Monday	November 1	Selected Chinese scientific writings (**) “Ancient Hindu Science” (**) Vaisesika Sutra, selection 1 (**)
Wednesday	November 3	
Friday	November 5	
Monday	November 8	Vaisesika Sutra, selection 2 (**) Islamic and Jewish selections (**) Maimonides selections (**)
Wednesday	November 10	
Friday	November 12	
Monday	November 15	Kuhn, <i>Copernican Revolution</i> , ch. 2 (pp. 45-77) Kuhn, <i>Copernican Revolution</i> , start ch. 5 (pp. 134-160) Kuhn, <i>Copernican Revolution</i> , finish ch. 5 (pp. 160-184)
Wednesday	November 17	
Friday	November 19	
Monday	November 22	NO CLASS—Professor travelling for conference Paper #4 due by noon NO CLASS—Thanksgiving Break NO CLASS—Thanksgiving Break
Wednesday	November 25	
Friday	November 27	
Monday	November 29	Galileo, “The Starry Messenger,” in <i>Discoveries and Opinions of Galileo</i> , pp. 27-58 Galileo, start “Letters on Sunspots,” <i>Discoveries and Opinions of Galileo</i> , pp. 89-119 Galileo, finish “Letters on Sunspots,” <i>Discoveries and Opinions of Galileo</i> , pp. 119-144
Wednesday	December 1	
Friday	December 3	
Monday	December 6	<i>Students collaboratively write take-home final exam</i> Sky Watching Lab Reports due by class time Rovelli, <i>Seven Brief Lessons on Physics</i> , pp. 1-38 Rovelli, <i>Seven Brief Lessons on Physics</i> , pp. 39-81
Wednesday	December 8	
Friday	December 10	
Monday	December 13	FINAL EXAM SESSION—Take-home exam due via Blackboard by 12:30pm