

ASTR 320
Philosophy and History of Astronomical Thought

Spring 2022
Tuesdays and Thursdays, 12:30-1:45 pm

SYLLABUS

Ver. 1

ASTR320 covers the History and Philosophy of Astronomy, from prehistorical times to the present. The story of astronomy is central to the history of science and to the history of thought in general. It plays a principal role in the narratives about this development as told by various historians with their differing philosophies and presumptions. We shall learn, using a “flipped classroom” format. Students will individually familiarize themselves with class material asynchronously, and we shall use our live online time for discussions and to work together on various assignments.

Course Syllabus: Your Roadmap to ASTR 320

Disappointment and misunderstanding often arise because of miscommunication of expectations. The goal of this document is to minimize such issues, serving as a "contract" between teachers and students.

Course Materials

There is **no required textbook** for this course. Material will be made available through D2L. Once you register in ASTR320 you will see the course appear under your Student Tab. It is where you go to know what to do.



Instructor: Pavol "Paul" Gabor, S.J., Ph.D.
 Email: pgabor@arizona.edu
 Office: Steward Observatory, Room N209
 Phone (office): (520) 621-6043 (please use voicemail)
 Phone (cell): (520) 289-4167
 Bio: vaticanobservatory.va

Dr. Gabor will respond to your emails within 24 hrs, Mon-Fri.

Course format

We shall use a “flipped classroom” format. There will be no lectures during our time together. Students will individually familiarize themselves with class material asynchronously in preparation for each class session. The pre-recorded presentations (Panopto) will be about 20 minutes long, and quiz questions will be inserted in the playback. Furthermore, in order to initiate (and document) an intellectual engagement with the material, each student will submit a substantive question on D2L, which will also help us start our in-class discussion.

Our common sessions on Tuesdays and Thursdays will be dedicated to discussions and other activities, some of which will resemble what in a traditional (“unflipped classroom”) context would be homework. First we shall discuss the presentation you will have viewed in your own time prior to our common session. Then we shall work on small projects: hands-on online searches, determining the pedigree of information and ideas, reading texts and writing summaries or précis, learning about the academic publication process (peer reviewed journals, press releases, book reviews, etc.), cosmological and other philosophical presuppositions, the applicability limits in scientific statements, etc. There will be deliverables from these activities: Each student will submit a brief written report for each assignment.

Activities & Grading

Final grades for the course will be based on a simple sum of the points you earn for the various graded activities. The following table is my initial idea but it is still a work in progress:

ACTIVITY		#	@		sub/total
presentation with quiz	individual asynchronous	26	0.5	pts	13 pts
classroom work with texts, sources, etc.	common with individually written report	TBD	51	pts	51 pts
test	online synchronous	3	12	pts	36 pts
					100 pts

If your total is 90 points or greater your grade will be A, 80 to 89 points – B, 65 to 79 points – C, and 55 to 64 points – D. If your total is 54 points or less, you will not pass.

The requirements for written work and the assessment criteria are explained in appropriate rubrics.

Course Learning Outcomes

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

- understand the nature and application of physical science
- apply ideas and processes beyond the classroom
- recognize the complexity of many scientific issues
- speak and write about scientific knowledge
- critically analyze and interpret science information in mass media
- read and understand scientific literature from popular sources such as magazines and newspapers

Course Goals & Objectives

Is our identity as individuals and as culture formed by our history? What is the role of science in the development of our civilization? What preconceived ideas (if any) is a given historian of science disseminating? What is cosmic and cosmological symbolism? How does it function within the collective unconscious? How does science interact with it?

ASTR320 is designed with active learning in mind, i.e., it is guided by the principle that students learn more effectively when stimulated by classroom activities (as opposed to listening to lectures). In the process, you will also develop communication skills, quantitative literacy, critical-reasoning ability, and evidence-based problem-solving skills. Engaging in student-to-student discourse is a significant component of this course. By working in groups, you will be stimulated to interpret, judge, synthesize and communicate, often across the differences in disciplines and backgrounds present within each group.

There will be bibliographical assignments in ASTR320. Their broader purpose is to let you understand, recognize and appreciate the flow, assessment and communication of scientific information.

Course Schedule

See the D2L "Calendar" tool (remember to set "Display Options" >> "Course Events" appropriately). For an illustrative draft, see the attached sheet. Course material and activities may not follow the exact dates indicated in the draft with the notable exception of the three tests. Tests will be administered on the dates given in the schedule: (1) Feb 22, (2) Apr 5, and (3) May 3. Note that your ASTR320 grades will be finalized by May 4. There will be no ASTR320 test nor examination during finals' week.

Attendance & Active Participation

The UA's policy concerning Class Attendance, Participation, and Administrative Drops is available at catalog.arizona.edu/policy/class-attendance-participation-and-administrative-drop. The UA policy regarding absences for any sincerely held religious belief, observance or practice (<http://www.registrar.arizona.edu/calendar-religious-holidays>) will be accommodated where reasonable, <http://policy.arizona.edu/human-resources/religious-accommodation-policy>.

Etiquette

Everyone in the class is expected to abide by and follow the UA's Student Code of Conduct [public.azregents.edu/PolicyManual/5-308-Student Code of Conduct.pdf](http://public.azregents.edu/PolicyManual/5-308-Student%20Code%20of%20Conduct.pdf), and to refrain from disruptive behavior as outlined by the UA policy <http://policy.arizona.edu/education-and-student-affairs/disruptive-behavior-instructional-setting>.

The UA Threatening Behavior by Students Policy prohibits threats of physical harm to any member of the University community, including to one's self. See policy.arizona.edu/education-and-student-affairs/threatening-behavior-students.

UA Nondiscrimination and Anti-Harassment Policy

The University is committed to creating and maintaining an environment free of discrimination (policy.arizona.edu/human-resources/nondiscrimination-and-anti-harassment-policy) and harassment ([title-ix-policies](http://policy.arizona.edu/human-resources/title-ix-policies)).

Late Work

No credit, with no exceptions, will be given for late work. In order to be fair to those that turn in their work on time, late work will not be accepted. If you are concerned about not being able to turn in your work on the due date, please turn it in early! **Err on the side of prudence!** If you choose to wait until a few hours before the deadline to do your assignment, you are taking a risk. Should your printer break, internet go down, or an emergency arise, these will NOT be valid excuses.

Missed Tests

No makeup tests, with no exceptions, will be administered. The tests are already scheduled and posted on the class schedule. If you know that you will miss a test, for valid reasons, contact the instructor as soon as possible.

Makeup Credit?

Near the end of term, there will be no makeup or extra credit assignments. Do not expect to compensate for poor work at the end of the term with additional work.

Disputing Grades

You have one week from the time an assignment or exam is returned to challenge any perceived errors. Although rare, there are occasions when grading errors occur, and you should review your returned work.

Academic Honesty

Students are encouraged to share intellectual views and discuss freely the principles and applications of course materials. However, graded work/exercises must be the product of independent effort unless otherwise instructed. Students are expected to adhere to the UA Code of Academic Integrity as described in the UA General Catalog. See [code-academic-integrity](#). *Selling class notes and/or other course materials to other students or to a third party for resale is not permitted without the instructor's express written consent.* Violations to this and other course rules are subject to the Code of Academic Integrity and may result in course sanctions. Additionally, students who use D2L or UA email to sell or buy these copyrighted materials are subject to Code of Conduct Violations for misuse of student email addresses. This conduct may also constitute copyright infringement.

Accessibility and Accommodations

At the University of Arizona, we strive to make learning experiences as accessible as possible. If you anticipate or experience barriers based on disability or pregnancy, please contact the Disability Resource Center (520-621-3268, <https://drc.arizona.edu>) to establish reasonable accommodations.

Subject to Change Statement

Information contained in the course syllabus may be subject to change with advance notice, as deemed appropriate by the instructor.

Date	Material	Assignment due
		online asynchronous written
Thu 13 Jan	Cosmic scales. Introduction	
Tue 18 Jan	Night sky. Archaeoastronomy	1: Jan 18
Thu 20 Jan	Historiography. Flat Earth. Progress. Whig history	2: Jan 20
Tue 25 Jan		3: Jan 25
Thu 27 Jan	Babylonians. Egyptians	4: Jan 27
Tue 01 Feb	Pythagoreans. Milesians	5: Feb 1
Thu 03 Feb	Plato. Saving the Phenomena. Eudoxus	6: Feb 3
Tue 08 Feb	Eratosthenes	7: Feb 8
Thu 10 Feb	Aristotle	8: Feb 10
Tue 15 Feb	Hipparchus	9: Feb 15
Thu 17 Feb	Ptolemy	10: Feb 17
Tue 22 Feb	Test 1	Bibliography 1
Thu 24 Feb		
Tue 01 Mar	Aristotle's physics	11: Feb 24
Thu 03 Mar	Copernicus	12: Mar 1
Tue 08 Mar	SPRING BREAK	13: Mar 3
Thu 10 Mar	SPRING BREAK	Précis 2
Tue 15 Mar	Tycho Brahe	
Thu 17 Mar	Kepler	14: Mar 15
Tue 22 Mar	Galileo	15: Mar 17
Thu 24 Mar	Riccioli	16: Mar 22
Tue 29 Mar	Historiography. "Martyrs of science."	17: Mar 24
Thu 31 Mar		18: Mar 29
Tue 05 Apr	Test 2	19: Mar 31
Thu 07 Apr	Descartes	Bibliography 4
Tue 12 Apr	Newton	20: Apr 7
Thu 14 Apr	Halley. W. & C. Herschel	21: Apr 12
Tue 19 Apr	Photography. Spectroscopy	22: Apr 14
Thu 21 Apr	Astrophysics	23: Apr 19
Tue 26 Apr	Nebulae and the Galaxy. Shapley. Curtis. The Great Debate. Hubble	24: Apr 21
Thu 28 Apr	Extraterrestrials. Atomists, Epicureans, Cusanus, Bruno, Fontenelle.	25: Apr 26
Tue 03 May	Test 3 (end of ASTR320)	26: Apr 28
Thu 05 May	READING DAY	
Wed 11 May	1 - 3 pm: no ASTR320 activity	