

ASTR 305 The History of Astronomy
Spring 2017
Tuesday & Thursday 2:00-3:15 pm
Location: See Schedule



Instructor: Dr. Adriana Durbala
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Office Hours: I have scheduled five office hours weekly:
Monday 10:00 – 11:00 a.m. & 12:00 – 1:00 p.m.
Wednesday 10:00 – 11:00 a.m. & 2:00 – 3:00 p.m.
Friday 9:00 – 10:00 a.m.
(or anytime my office door is open)

Course Description:

History of Astronomy is an interdisciplinary exploration of astronomy from ancient to modern times that integrates scientific principles and discoveries within a global and historical perspective. In this class, you will learn basic astronomical principles, ideas, and practices. You will also be able to situate astronomical science within its social and historical context. My hope is that you will come away from this course with a better understanding of astronomical science and an appreciation for how astronomy was (and remains) a cultural endeavor.

The course takes the broad view of the history of astronomy. It is structured chronologically, beginning with prehistory and ending with modern astronomical thought. But it is also thematic: we explore the role of astronomy in the scientific revolution, questions concerning cosmology and our place in the universe, the impact of society on astronomy and vice versa, to

name but a few. To achieve these goals, the course is a roughly even mixture of lecture, in-class activities, and reading discussion. Thus you will be required to take notes during lecture as well as actively participate in in-class activities and discussion of various readings, which as you'll see below is significant. You will not be successful in this class if you do not actively engage with these class activities.

There are no prerequisites (other than sophomore standing) and you do need any background in astronomy, mathematics, or history to do well in this course.

Learning Outcomes:

Enduring Understandings:

Astronomical science is not a separate realm that sits outside of culture (i.e. science is affected by human culture and vice versa.)

Course Objectives:

Any engaged student who works assiduously in this course will be able to analyze how:

- 1) Modern scientific practices generate astronomical knowledge.
- 2) Scientific ideas emerge and develop within a specific historical context.
- 3) Past cultures/people have understood, interpreted and valued astronomy.
- 4) Astronomical ideas have shaped how humans have understood their place in the cosmos.

Required Readings (available as *Rental Textbooks*):

Anthony Aveni, *Stairway to the Stars*, John Wiley and Sons, 1997.

Robert Poole, *Earthrise: How Man First Saw the Earth*, Yale University Press, 2008.

Desire2Learn (D2L): In addition to the books above, you will also be **required to read articles, print, and bring them to class to discuss**. These will be available on D2L. They are noted in the schedule below with an asterisk (*).

Sometimes readings not included in the schedule below will be assigned during the in-class activities or lecture. You will be responsible for reading these and bringing them to the next class. **You must rent the books and bring them to class on the days we discuss them**. Students who fail to bring their readings to class for discussion will be docked points on their in-class assignments.

Course Website:

<http://www.uwsp.edu/d2l/Pages/default.aspx>

Log on using your UWSP login and password. ***This website will be used for posting grades, lecture notes/comments, assignments, class announcements, library and web resources, etc.***

Assignments:

Quizzes: There will be various quizzes throughout the semester in both the lectures and the in-class activities component of the class. Quizzes may not be made up in any circumstance. To account for illness and other unforeseen legitimate issues that may prevent you from attending class, the lowest quiz grade will be dropped at the end of the semester. This will be done automatically through D2L. Does this mean you should come to class consistently? Yes. Yes, it does. Quizzes will be: in-class written, take-home and/or online on D2L. The D2L quizzes will be announced in class in advance.

In-Class Activities/Assignments: There will be twelve in-class assignments (which, in some cases, may require you to complete them at home) associated with the *in-class activities* component of class. What these are and how to complete them will be discussed in class. In-class assignments may not be made up in any circumstance. To account for illness and other unforeseen legitimate issues that may prevent you from attending class, the lowest assignment grade will be dropped at the end of the semester.

Paper: There will be a major paper assignment of 8 - 10 pages. The paper will require you to think deeply about a historical issue associated with astronomy. There are various assignments associated with this paper before you turn it in. These are noted in the schedule below.

Final Exam: There will be a cumulative final exam for this course on May 16th. It will be comprised of multiple choice questions and/or short-answer questions.

Grade Breakdown (weighted):

Quizzes: 20%

In-Class Assignments: 20%

Paper: 40%

(Thesis Statement: 10 points

Writers' Workshop Draft: 20 points

Final Paper Draft: 100 points

Total: 130 points)

Final: 20%

Total: 100%

Grading Scale (percentage):

A	93-100 %	B-	80-82.99 %	D+	67-69.99 %
A-	90-92.99 %	C+	77-79.99 %	D	60-66.99 %
B+	87-89.99%	C	73-76.99 %	F	less than 60%
B	83-86.99 %	C-	70-72.99 %		

Other Stuff:

Attendance: I will record attendance for the lecture portion of this class. Students who miss 3 lectures will be docked a 1/3 of a grade from their final grade. Students who miss 5-6, 2/3rds of a grade, 7 a full grade, and so on. For example, if you were to earn a B in this class, but missed 3 classes, your final grade would be a B-.

In-Class Activities Component: As you will notice from the schedule below, a significant portion of this class is comprised of in-class activities (usually on Thursday). In-class activities will usually be held in the astronomy lab (Science Building B204), but also at times in the planetarium (right around the corner from the astro lab). Where you are to be for the in-class activities can be found in the schedule below.

Electronics: All electronics must be turned off during class or put in silent mode, unless instructed by us to use them. These include cell phones, laptops, headsets, and tablets. In some cases an electronic device may be permitted if the student has an accommodation approved by the Disability Services Office (see below).

Plagiarism: For information on plagiarism, consult <http://www.uwsp.edu/stuaffairs/Documents/RightsRespons/Academic%20Integrity%20Brochure.pdf>. See Chapter 14, ***Student Academic Standards and Disciplinary Procedures***, pages 5 -10, for the disciplinary possibilities if you are caught cheating. I will vigorously pursue all incidents of plagiarism. The essay will be checked for originality.

Equal Educational Opportunities: If you have a learning or physical challenge which requires classroom accommodation, please contact the UWSP Disability and Assistive Technology Center (6th Floor of the Learning Resources Center) with your documentation as early as possible in the semester. They will then notify us, in a confidential memo, of the accommodations that will facilitate your success in the course. Voice: (715) 346-3365, TTY: (715) 346-3362, <http://www.uwsp.edu/disability/Pages/default.aspx>.

Writing/Reading Help: This is a reading and writing intensive course. If you need help you can visit the Tutoring and Learning Center in the basement of the Library. They are there to help you with papers etc. This is totally free! Their webpage is <http://www.uwsp.edu/tlc/Pages/writingReadingTutorials.aspx>. You can also call them to make an appointment at (715) 346-3568.

In case of emergency: <http://www.uwsp.edu/rmgt/Pages/em/procedures/default.aspx>

Final note: Common courtesy dictates that students attending a class should remain seated for the duration of class. While in class, students should refrain from using phones, music players, head phones, etc. and should also refrain from gossiping/chatting while the professor is lecturing and other students are listening and taking notes. Students who consistently engage

in this type of disruptive behavior will be asked to leave and will receive an email requesting a meeting with the professor before being admitted back to class.

***Note: This schedule of topics/activities is tentative and might be altered for any reason.**

TENTATIVE SCHEDULE

Week	Topics
Unit I – Premodern Astronomy	
Week 1 Jan 23-27	Tuesday – Course Introduction (A109 SCI) Intro to basic astronomical concepts
	Thursday – In-class Activity 1- <i>Motions on the Celestial Sphere through the Eyes of Ancient Stargazers</i> (B204 SCI)
Week 2 Jan 30 - Feb 3	Tuesday – What is the History of Astronomy? Intro to Night Sky & Constellations – Planetarium – 2 nd floor Science Building by the pendulum
	Thursday – Lecture on Prehistory and the Heavens – Planetarium show “Dawn of Astronomy” – Planetarium – 2 nd floor Science Building by the pendulum – 55 minutes – Earliest Hints of Earth’s Precession. Demo using program <i>Starry Night</i> – 20 minutes (B204 SCI)
Week 3 Feb 6-10	Tuesday – Lecture on Ancient Astronomy (A109 SCI) * Lombardi, “Why is a minute divided into 60 seconds...”
	Thursday– In-class Activity 2 - <i>Stonehenge and the History of Science Discussion</i> (B204 SCI) * Aveni, “Stairway to the Stars”, vii-92. * Schuster, “The Problem of ‘Whig History’ in the History of Science”.
Week 4 Feb 13-17	Tuesday – Lecture on Classical and Pre-Columbian Astronomy. Calendars (A109 SCI) – Essay prompt handed out
	Thursday– In-class Activity 3 – <i>Measuring the Position of Stars and Sun in the Sky</i> (B204 SCI)
Week 5 Feb 20-24	Tuesday – Lecture on Medieval / Islamic Astronomy. Islamic Calendars (A109 SCI) * Saliba, “Greek Astronomy and the Medieval Arabic Tradition”
	Thursday – In-class Activity 4 – <i>Phases of the Moon. Lincoln Almanac Trial.</i> (B204 SCI)
Unit II – Astronomy and The Scientific Revolution	
Week 6 Feb 27- Mar 3	Tuesday – Lecture on Copernican “Revolution”. The Pre-Newtonians: Brahe, Kepler, and Galileo (A109 SCI) * Osiander, “Foreword” to Copernicus, <i>On the Revolution of the Heavenly Spheres</i> .
	Thursday – In-class Activity 5 – <i>Kepler and Bruno Discussion</i> (B204 SCI) * Granada, “Kepler and Bruno on the Infinity of the Universe and of Solar Systems”.
Week 7 Mar 6-10	Tuesday – Lecture on The Pre-Newtonians: Brahe, Kepler, and Galileo (continued) (A109 SCI)
	Thursday – In-class Activity 6 – <i>Galileo Affair Discussion</i> (B204 SCI) * McMullin, “The Galileo Affair: Two Decisions” * Lewis, “Truth and Propaganda in Images of the Trial of Galileo” * Finocchiaro, “Science, Religion, and the Historiography of the Galileo Affair... ”.
Week 8 Mar 13-17	Tuesday – Lecture on Newtonian Physics and Astronomy (A109 SCI)
	Thursday – In-class Activity 7 – <i>Newton’s Apple and Other Myths about Science Discussion</i> (B204 SCI) * Selections from <i>Newton’s Apple and Other Myths about Science</i>
Mar 18 - 26 – Spring Break	

Week 9	Tuesday – Thesis Writing/Revision Workshop; thesis due (B204 SCI)
Mar 27-31	Thursday – In-class Activity 8 – <i>Measuring the Mass of the Black Hole at the center of the Milky Way</i> (B204 SCI) * application of the Newtonian laws
Unit III – Modern Astronomy	
Week 10	Tuesday – Lecture on <i>Telescopic Observations and New Findings in the Solar System</i> (A109 SCI) Movie – <i>400 Years of the Telescope: A Journey of Science, Technology, and Thought</i>
Apr 3-7	Thursday – In-class Activity 9 – <i>Herschel View of the Universe Discussion</i> (B204 SCI) * Crowe, “Astronomy and Religion: Two Case Studies Involving Ideas of Extraterrestrial Life”
Week 11	Tuesday – Lecture on <i>Milky Way as an Island Universe. Harlow-Shapley Debate</i> (A109 SCI)
Apr 10-14	Thursday – Writers’ Workshop; 4-5 pages essay draft due (B204 SCI)
Week 12	Tuesday – Lecture on <i>Hubble and Cosmology</i> (A109 SCI)
Apr 17-21	Thursday – In-class Activity 10 – <i>Discovery of the Expansion of the Universe Discussion</i> (B204 SCI) * Buchanan, “Lost in translation” * Livio, “Lost in translation: Mystery of the missing text solved” * Nussbaumer & Bieri, “Who discovered the expanding universe?” * Block, “Georges Lemaitre and Stigler’s Law of Eponymy” * van den Bergh, “The Curious Case of Lemaitre's Equation No. 24”
Week 13	Tuesday – Lecture on <i>Theory of Relativity of Einstein</i> (A109 SCI)
Apr 24-28	Thursday – In-class Activity 11 – <i>Earthrise Workshop</i> (B204 SCI) * Poole, “Earthrise”
Week 14	Tuesday – Lecture on <i>Astrobiology</i> (A109 SCI)
May 1-5	Thursday – In-class Activity 12 – Planetarium show “Endless Horizon” – Planetarium – 2 nd floor Science Building by the pendulum
Week 15	Tuesday – Lecture on <i>Exoplanets</i> (A109 SCI)
May 8-12	Thursday – Movie – <i>What Is Out There? A History of Astronomy & Wrap Up</i> (B204 SCI) – final draft of the paper due
May 16	FINAL EXAM - Tuesday, May 16th 12:30-2:30 p.m.