AST 301 - Introduction to Astronomy
Fall 2015 – Unique No. 47490
MWF 11:00 – 11:50 @ WEL 3.502

Professor: Steven Finkelstein TA: TBD
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Help Sessions: M, Th 2p-3p

Prerequisites and Core Requirements:

This course has no prerequisites. AST 301 is intended to meet the requirements for the Core Component Area Natural Science and Technology and may be combined with AST 309G, 309L, 309N, 309R, or 309S for a six-hour Core sequence. This course will include work designed to develop skills in critical thinking, communication, quantitative analysis, and teamwork. This will involve such activities as peer-to-peer discussions and critical analysis of key concepts, written or oral presentations on current discoveries, and quantitative problem solving. Communication in the course will consist of student questions and subsequent classroom discussions during lecture and may also involve essay exams, and take-home assignments. Teamwork in the course may consist of working in small groups during help sessions and instructor-modeled problem solving that is guided by student decisions and group feedback. The course material will emphasize the synthesis of observation and theory to gain insight into the operation of the natural world, drawing on other fields such as physics, chemistry, geophysics, or biology.

Class Website:

This course will be primarily run through the Canvas system, at canvas.utexas.edu. All class communication will be done through Canvas.

Course Description:

This course will provide an overview of astronomy, including basic physical concepts, planets, stars, galaxies, and cosmology. The design of the course will focus on conceptual understanding, rather than memorization of facts. The students will learn how science works, and develop critical thinking skills, as well as gaining an appreciation for the universe around us, and an understanding of the importance of continued scientific study. There are no prerequisites for this course. The concepts will be primarily qualitative, though there will be a small amount of algebra in the course.

Required Texts and Other Items:

- The Cosmic Perspective, 7th Edition, Bennett, Donahue, Schneider & Voit
- Lecture-Tutorials for Introductory Astronomy, 3rd Edition, Prather, Slater, Adams & Brissenden
- Access to Mastering Astronomy, which we will use for homework. See instructions below.
- Access to SquareCap, which will be used for in-class participation. See instructions below.

The Coop sells several different bunding options for the main text, the lecture tutorials, and Mastering. These can also be purchased various places online. Beware there has just been released an

8th edition of this text, but we will be using the 7th edition. Note that while you may wish to rent the main text, I advise against renting the lecture tutorial book, as we will be writing directly on the pages.

Instructions for Mastering Astronomy:
Coming soon.

Instructions for SquareCap:
A one page PDF can be found in the "Files" section of this courses Canvas site which has instructions for how to get set up.

Class Structure:
Rather than a typical college survey course composed of solely lecturing, this course will combine short lectures with discussions and group activities. You will only learn if you participate, thus attendance and participation is ***required***! A typical class day will be composed of the following:

- Astronomy in the news – submit ideas by the night before class.
- Brief synopsis of previous class; questions about concepts from previous class.
- Think-pair-share review question(s).
- 15–25 minute lecture (including breaks for discussion and think-pair-share questions).
- Lecture tutorial in groups, followed by whole class discussion.

Grading Components and Policies:
You will receive the grade you earn. There will be no extra credit awarded after the semester, so please be sure to put in the effort throughout the semester to earn the grade you want.
The composition of the course grade is:

- Seven quizzes = 40% (drop the lowest score)
- Online homework = 20%
- In-class participation = 20%
- Projects = 20%

This class will not be graded on a curve. The average percentage in each of these grade components will be weighted by the above percentages to derive the final course grade, which will be assigned as follows (where the numbers represent the percentage of total points):

	93–100 = A	90-92.9 = A−
87-89.9 = B+	83-86.9 = B	80-82.9 = B−
77-79.9 = C+	73-76.9 = C	70-72.9 = C−
67-69.9 = D+	63-66.9 = D	60-62.9 = D−
	< 59.9 = F	

Quizzes: There will be seven in-class, non-cumulative quizzes, and no final quiz. The quiz grade will be composed of the mean of the six highest quiz scores; in other words, you get to drop one quiz. **There will be no makeup quizzes**, thus if you miss an quiz, that is your drop. If you miss two quizzes, one will count as a zero. These quizzes will not be cumulative, and will cover set lecture periods. The dates for the quizzes are on the calendar at the end of this document. Myself and/or the TAs will schedule additional help sessions the day or two before the exam.

Emergencies: If an emergency occurs (death in the family, hospitalization, etc.), you must contact me prior to the start of the quiz. In extreme cases, we can discuss make-up opportunities.

Homework: Homework will be primarily assigned online through the Mastering Astronomy system. An access code to this system is *required*. If you purchased a version of the text without this code, you will have to purchase this separately. The homework will typically be review questions over the assigned reading to be completed prior to the scheduled class, as well as interactive questions regarding material recently covered. **Late homework will not be accepted**. Occasional additional homeworks may be assigned during classtime.

Participation: In-class activities play a big role in this class, and your **participation is required**. Participation will be recorded via Squarecap, where the percentage of completed questions is converted to your grade. Although makeup participation points will not allowed, I realize that students may need to occasionally miss class. For this reason, if you submit a response to at least 80% of the Squarecap questions throughout the semester, you will receive full credit for this portion of your grade (100 points). The remaining grade breakdown will be: 70–80% completion = 85 points; 60–70% completion = 75 points; <60% completion = you will receive the number of points equal to your completed percentage. Students who have excused absences as part of a university sponsored event are required to come talk to me in advance of the absence.
Part of your astronomy education will also be to review recent events in astronomy, by frequently visiting websites such as space.com, sciencedaily.com, and astronomy.com. As part of your participation grade, you will be *required to start and participate in discussions on Canvas based on two astronomy news items* that you have read. To receive full credit, you must start at least two news-related discussions, and contribute to *at least* two discussions started by other students. You must start at least one discussion, and contribute to at least one discussion by Oct 31st. The second one of each must be completed by December 1st. Lastly, when I choose an item to discuss in class, I will call on those who posted and commented the item to come to the front of the class and lead the discussion. If you are not in attendance, you will not receive credit for posting or commenting on the item.

Projects: This component of the grade will be based on four separate projects.

- Projects #1 and #2: Writing assignments about recent astronomy news items (these can be the same items you discuss on Canvas). This will include an introduction to the topic, why it is important, how the new observations or analyses have led to the current discovery, and what some remaining questions in this area are. Each of these assignments must be two pages typed, with citations appearing on a third page, with 12 pt font, and double spaced, with the students name and EID at the top. *These assignments will be submitted electronically through Canvas.*
- Project #3: Astronomical Observing: To do this, students will need to visit the telescope on the roof of Painter Hall during one of the Friday and Saturday night public viewing events, or the roof of RLM during one of the Wednesday night events. Information on these events can be found here: http://outreach.as.utexas.edu/public/viewing.html They will then hand in a double spaced, two page summary of what they observed, including details of time of observation, where the object was in the sky, and how they found the object. The students should also research the object they observed, and include a discussion in their write-up. The students should attach a sketch of the night sky around this object. Students must also include proof of attendance, which can be obtained by the telescope operator. I suggest that you start early, as these events are not held during cloudy nights, and this assignment *will not be excused.*
- Project #4: Moon Journal: For at least 10 clear nights over the space of one month, go outside

and sketch the Moon and any nearby stars, accurately drawing the phase. Label the phase (waxing/ waning, new/quarter/full) for each drawing. Give the time of the observation, as well as the location of the moon in the coordinate system of your choice (i.e., high in the southern sky, low in the SW, etc.). Compile these drawings together and turn in to complete your assignment.

The due dates for these assignments are:

- Project #1 (Writing Assignment) – Sep 23
- Project #2 (Writing Assignment) – Oct 21
- Project #3 (Observing) – Anytime before or on December 2nd
- Project #4 (Moon Journal) – Anytime before or on December 2nd

Extra Credit: There will be *no* extra credit opportunities in this class.

Class Policies:

- The course webpage on the Canvas system will be updated with course announcements, reading assignments, and deadlines. It is **your responsibility to check these on a regular basis.** Please come to class prepared, having read the required reading assignments, also please be prepared to participate in in-class discussions and activities, this is for your benefit.
- Do not pack up or leave class early unless you have talked to me in advance, as a consideration to me and your fellow students.
- To facilitate group-work, please sit together, and close to the front.
- Phone: Phone use and texting during class will not be tolerated. Make sure your phones are off, and keep them put away during the class. Students using their phones will be asked to leave, and will not earn participation for that day.
- Laptops/Tablets: Though laptop and/or tablet use will not be a necessary part of the class, I acknowledge that some students prefer to take notes electronically, thus their presence will be permitted. I request that these students sit towards the back so that they do not distract other students. Students found to be using their computers for non-class activities will be a distraction to those around them, and will be asked to leave, and will not earn participation for that day. If laptop distraction becomes a problem, I reserve the right to reverse this policy.
- As part of my duties as professor I am a professional research astronomer, which requires travel during the semester. I will do my best to minmize the impact of this travel, and will endeavor to maintain canvas communication at all times while out of Austin. When I am gone, another UT astronomer professor will lead the class in my place.

Approximate Course Schedule:

Dates	Topics
Week 1 - Aug 24 Week 1 - Aug 26	Introduction, course goals, overview of universe Introduction, continued
Week 2 - Aug 29 Week 2 - Aug 31 Week 2 - Sep 2	The Night Sky The Night Sky/Seasons Seasons
Week 3 - Sep 5 Week 3 - Sep 7 Week 3 - Sep 9	*Labor Day - No Class* Phases of the Moon **Quiz #1 - Some Basics** (6 lectures)
Week 4 - Sep 12 Week 4 - Sep 14 Week 4 - Sep 16	Eclipses Ancient Models of the Universe Kepler & Galileo
Week 5 - Sep 19 Week 5 - Sep 21 Week 5 - Sep 23	Kepler & Galileo Process of Science & Motion Newton & Gravity
Week 6 - Sep 26 Week 6 - Sep 28 Week 6 - Sep 30	Newton & Gravity Nature of Light **Quiz #2 - Ancient-ish Astronomers** (7 lectures)
Week 7 - Oct 3 Week 7 - Oct 5 Week 7 - Oct 7	Blackbody Radiation Blackbody Radiation & Atoms Atoms and Spectra
Week 8 - Oct 10 Week 8 - Oct 12 Week 8 - Oct 14	Telescopes **Quiz #3 - Light and Telescopes** (5 lectures) Fusion
Week 9 - Oct 17 Week 9 - Oct 19 Week 9 - Oct 21	Fusion and the Sun Magnitudes The Solar System
Week 10 - Oct 24 Week 10 - Oct 26 Week 10 - Oct 28	The Solar System **Quiz #4 - Fusion, Sun & Solar System** (5 lectures) Stars
Week 11 - Oct 31 Week 11 - Nov 2 Week 11 - Nov 4	HR Diagram Evolution of Stars Evolution of Stars
Week 12 - Nov 7 Week 12 - Nov 9 Week 12 - Nov 11	Exoplanets & Aliens **Quiz #5 - Stars and Exoplanets** (5 lectures) The Milky Way
Week 13 - Nov 14 Week 13 - Nov 16 Week 13 - Nov 18	The Milky Way and Galaxies Galaxies Mysteries in the Universe
Week 14 - Nov 21 Week 14 - Nov 23 Week 14 - Nov 25	**Quiz #6 - Galaxies** (3 lectures) *Thanksgiving - No Class* *Thanksgiving - No Class*
Week 15 - Nov 28 Week 15 - Nov 30 Week 15 - Dec 2 Week 15 - Dec 6	Galaxy Evolution Galaxy Evolution The Big Bang and Fate of the Universe **Quiz #7 - The Distant Universe** (4 lectures)

Academic Dishonesty:

University of Texas Honor Code: The core values of The University of Texas at Austin are learning, discovery, freedom, leadership, individual opportunity, and responsibility. Each member of the university is expected to uphold these values through integrity, honesty, trust, fairness, and respect toward peers and community. Students who violate University rules on scholastic dishonesty are subject to disciplinary penalties, including the possibility of failure in the course and/or dismissal from the University. Standards for Academic Integrity are posted at http://deanofstudents.utexas.edu/sjs/acint_student.php

Plagiarism: As a research university, the University of Texas at Austin takes plagiarism very seriously. Do not risk getting involved in a plagiarism infraction - the consequences simply arent work it. Always cite your sources, and when in doubt consult a professor or librarian. You may also read more about plagiarism at the Student Judicial Services website:
http://deanofstudents.utexas.edu/sjs/acamdemicintegrity.html

Documented Disability Statement:

Please notify me of any modification/adaptation you may require to accommodate a disability-related need. The University of Texas at Austin provides upon request appropriate academic accommodations for qualified students with disabilities. For more information, contact Services for Students with Disabilities at 471-6259 (voice) or 232-2937 (video phone) or
http://www.utexas.edu/diversity/ddce/ssd

Email:

Email is recognized as an official mode of university correspondence; therefore you are responsible for reading your email for university and course-related information and announcements. Please check your email regularly and frequently.