

**AST 301 - Introduction to Astronomy**  
**Fall 2015 – Unique No. 46665**  
**TTh 9:30 – 10:45 @ WEL 3.502**

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**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](http://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 & Brisenden
- Access to Sapling Learning, which we will use for homework. See instructions below.
- You are required to bring one 3×5 notecard to each class, which you will turn in to receive participation credit.
- You will be required to bring **in color** the ABC voting card and bring to every lecture. You can find this on Canvas, by clicking on “Files” on the left side.

There is currently no way to purchase the main text, the lecture tutorials, and the online homework system as a single bundle. The homework system can be purchased by itself on Sapling's website. For the text, you have several options:

- Purchase the texts at the Co-op. Both books are available new individually, and as a combined bundle.
- Purchase the texts online (for example, both are available at Amazon)
- Finally, Sapling Learning offers a program where they package their homework with low-cost used books. These packages are available online at this location:  
<http://www.saplingplusbooks.com/#!/astronomy/cqjw>.  
The package for this class is Bennett Cosmic Perspective 7E + Sapling 1 semester. If you do choose to purchase the Sapling Books package please be aware that Sapling will ship your book directly to you. They will also e-mail you an access code for the homework with login instructions. Payment on this site is through paypal. The access code will be sent to the e-mail address associated with the paypal account making the purchase. The book will be sent to the shipping address provided in the purchase. This means if a parent makes this purchase for you and provides their e-mail and their address then the access code and book will be sent there and not to you. Make sure you are checking the e-mail address associated with the paypal account for your access code. If you run into any issues on a direct order you should contact [book.orders@saplinglearning.com](mailto:book.orders@saplinglearning.com)
- 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.
- To access the Sapling Learning homework (which will require you to create an account, and pay the \$40 fee the first time), please follow the instructions from Sapling are available here:  
<http://www2.saplinglearning.com/help/student-single-sign>  
Doing this myself, I found the following steps to work:
  - Log into Canvas
  - Go to the homepage for this course
  - On the left side, click on the “Assignments” link
  - Click on “Sapling Homework”
  - Click on the button “Load Sapling Homework in a new window”
  - Follow instructions to create an account, or log in

### **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).
- 30–40 minute lecture (including breaks for discussion and think-pair-share questions).
- Lecture tutorial in groups, followed by whole class discussion.

## Grading Components and Policies:

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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:

- Four exams = 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	

Exams: There will be four in-class, non-cumulative exams, and no final exam. The exam grade will be composed of the mean of the three highest exam scores; in other words, you get to drop one exam. **There will be no makeup exams**, thus if you miss an exam, that is your drop. If you miss two exams, one will count as a zero. These exams will not be cumulative, and will cover set lecture periods.

<u>Exam</u>	<u>Date</u>	<u>Topic</u>	<u>Lectures Covered</u>
Exam #1	Sep 24	Intro, Night Sky, Seasons, Ancient Models	Aug 27 – Sep 22 (8 lectures)
Exam #2	Oct 15	Motion, Gravity, Light and Telescopes	Sep 29 – Oct 13 (5 lectures)
Exam #3	Nov 10	Stars and Planets	Oct 20 – Nov 5 (6 lectures)
Exam #4	Dec 3	Galaxies and the Universe	Nov 12 – Dec 1 (5 lectures)

Review Sessions: One of your TAs will hold an exam review session the evening before each exam, where they will answer any questions you have (though they will not have a prepared review themselves). Times and locations for the review sessions are:

<u>Date</u>	<u>Time</u>	<u>Location</u>
Sep 23	6:00–8:00pm	CPE 2.210
Oct 14	6:00–8:00pm	CPE 2.210
Nov 9	6:00–8:00pm	RLM 4.102
Dec 2	5:30–7:00pm	WEL 2.308

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

Homework: Homework will be primarily assigned online through the Sapling Learning 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. **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**. When we do lecture tutorials, you will receive your participation credit by turning in a 3×5 notecard with your name, EID, and answering a question asked in class. Although makeup participation points will not be allowed, I realize that students may need to occasionally miss class. For this reason, the three lowest in-class participation scores will be dropped. 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 facilitate 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 student's 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 22
- Project #2 (Writing Assignment) – Oct 13
- Project #3 (Observing) – Anytime before or on December 1st
- Project #4 (Moon Journal) – Anytime before or on December 1st

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

Approximate Course Schedule: \_\_\_\_\_

Dates	Topics
Week 1 - Aug 27	Introduction, course goals, overview of universe
Week 2 - Sep 1 Week 2 - Sep 3	Overview, continued The Night Sky
Week 3 - Sep 8 Week 3 - Sep 10	Seasons Phases of the Moon
Week 4 - Sep 15 Week 4 - Sep 17	Eclipses Ancient Models of the Universe
Week 5 - Sep 22 Week 5 - Sep 24	Kepler and Galileo <b>Exam #1</b>
Week 6 - Sep 29 Week 6 - Oct 1	Process of Science, Motion Newton and Gravity
Week 7 - Oct 6 Week 7 - Oct 8	Nature of Light, Blackbody Atoms and Spectra
Week 8 - Oct 13 Week 8 - Oct 15	Telescopes <b>Exam #2</b>
Week 9 - Oct 20 Week 9 - Oct 22	Fusion and The Sun Magnitudes
Week 10 - Oct 27 Week 10 - Oct 29	Stars and the HR diagram Evolution of Stars
Week 11 - Nov 3 Week 11 - Nov 5	The Solar System Planets around other stars, aliens!
Week 12 - Nov 10 Week 12 - Nov 12	<b>Exam #3</b> The Milky Way
Week 13 - Nov 17 Week 13 - Nov 19	Galaxies Mysteries in the Universe
Week 14 - Nov 24 Week 14 - Nov 26	<i>Thanksgiving - No class</i> Galaxy evolution
Week 15 - Dec 1 Week 15 - Dec 3	Big Bang and Fate of the Universe <b>Exam #4</b>

## 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.

## 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](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 aren't worth 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/academicintegrity.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.