

AST 301 – Introduction to  
Astronomy

Unique number: 47500

**MWF 12-1 Welch 3.502**

Instructor: **Judit Gyorgyey Ries**

Office: **RLM 13.134**



### **Course Description:**

This course will provide an overview of astronomy, including basic physics concepts, planets, stars, galaxies, and cosmology. We will focus on conceptual understanding, rather than memorization of facts, although you do need to remember some fundamental ones. You will get a taste of how science works, and develop critical thinking skills while you gain insight into how the Universe works. These skills should help you understand news about incredible scientific discoveries, to decide whether they are true, or just a hoax.

Textbook: Investigating Astronomy, T.S. Slater and R.A. Freedman (2nd or 1st edition, or e-book)

### **Course requirements**

There is no pre-requisite for this course. We will rely on high school physics, and some familiarity with interpreting formulas is necessary, but it is a skill we will practice in class. Attendance and participation is required, and they will count as part of your grade, as in-class, interactive learning activities will be an important part of this course. Research into how people learn shows that active discussions, verbalizing your thoughts helps you in understanding and retaining the material. You will be working in small groups of 2 to 4 people, discussing questions posed during the class. The course material will emphasize observation and theory which when combined gives us insight into the operation of the natural world. These interactive discussions will help you reinforce the concepts, help you complete your homework assignments and prepare for the exams.

Bring **3x5 index cards** into each class, and your voting card. You can find the PDF file on the Canvas website of this course in a folder called “administrative”. You need to download it from Canvas and print.

**Class Website:** All class communication will be conducted through Canvas at [canvas.utexas.edu](https://canvas.utexas.edu). Your student e-ID will give you access to the site. You can also

send e-mail through Canvas to me, your TAs, or you can start class related discussions. You will be submitting the essay type assignments through Canvas also.

**Homework:** There will be about 8 to 10 homework assignments. I encourage you to discuss the homework with classmates, and work on it together. However, you must write what you turn in on your own, using your own words. Just because you missed the deadline do not give up on the homework. If you submit it until 2 days past the deadline you will still receive 75% credit, if you are not more the 4 days late you still get 50%. Duplicate works will not receive credit.

**Observing task - Moon Journal:** Go outside find and sketch the Moon for at least 10 clear occasions over the space of one month. Note the date and the time of your observations. Describe the location of the moon in the coordinate system of your choice (i.e., high in the southern sky, low in the SW, etc.) Draw the phase as accurately as you can and include any nearby stars or landmarks. Do not forget to label the phase (waxing/ waning, new/quarter/full) for each drawing. Create a booklet of your drawings and turn it in to complete your assignment. Please turn it in no later than October 17.

**Essay:** Find a recent astronomy news item, not older than about half a year you would like to discuss. Include an introduction to the topic; what is the importance of the new finding, how the new observations or analyses have led to the current discovery; and what are some of the remaining questions in this area. Your work should be original, that is do not use excessive quotes from the article. If you quote or refer to a scientist, be sure to include the affiliation (institute, or university). The essay should be no more than two pages, with 12 point font, and double spaced. You can use a third page for references. Add your name and EID at the top. The recent news essay can be turned in anytime after completion, but the latest date is December 2.

**Exams:** There will be five in-class, written exams. Make up exams will be given only under exceptional circumstances; however, you can take a comprehensive final to make up for the missed one or to replace the worst exam. All exams will be closed book and closed-note. Before each test there is a review session to help you with the preparation. I recommend that you send your questions to us through Canvas, so we can focus on what you really need.

You can expect a quiz or a question during each lecture, except on exam days. You need to turn in you answer on the index card.

### **Grades:**

Grades will be based on attendance and in class participation (10% of the grade), home works (30%), the five exams (40%), the Moon journal (10%), and the recent news essay (10%). Please note, that having perfect attendance can gain you a full grade. (We have 5 classes, making it to 40 of them counts perfect attendance. You

can make up for one missed class by attending a Star Party. See at the end of the syllabus).

Extra credit assignments will not be an option for this course, just come to class and participate. If you missed a class, or need to clear up some concepts, come to our office hours, we are here to help you.

### **Grading scheme:**

90.00 – 100 A  
89.99 – 85.00 A-  
84.99 – 82.00 B+  
81.99 – 78.00 B  
77.99 – 75.00 B-  
74.99 – 70.00 C+  
69.99 – 65.00 C  
64.99 – 60.00 C-  
59.99 – 57.00 D+  
56.99 – 53.00 D  
52.99 – 50.00 D-  
49.99 or below - F

### **Course Conduct**

Please put your cell phones on airplane mode before you enter the classroom, unless you have a legitimate reason to expect a phone call. Then set it on “vibrate”, answering it only in case of an emergency. Also, as consideration for your fellow students stay till the end of the class early unless you have talked to me in advance about leaving.

Academic Dishonesty: 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/conduct.php>.

The penalty for cheating on an exam is serious; you will get a total score of zero.

Plagiarism: As a research university, the University of Texas at Austin takes plagiarism very seriously. The consequences of getting involved in a plagiarism infraction are simply not 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 accommodating 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>

Religious Holidays: By UT Austin policy, you must notify the professor of a pending absence at least fourteen days prior to the date of observance of a religious holy day. If you must miss a class, an examination, a work assignment, or a project in order to observe a religious holy day, you will be given an opportunity to complete the missed work within a reasonable time after the absence.

Department of Astronomy Ground Rules: The Department of Astronomy has ground rules for all of its undergraduate courses. They are described in the document "Memo to Undergraduate Astronomy Students Regarding Astronomy Courses," which is available online at

<http://www.as.utexas.edu/astronomy/education/memo.html>

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.

### Tentative Course Schedule

	Class date	Subject	Book chapter
Week 1	August 24	Introduction - Getting acquainted	Chapter 1
	August 26	Navigating the sky, Daily motion	
Week 2	August 29	Yearly motion, Seasons	Chapter 1
	August 31	Lunar phases/Eclipses	Chapter 1
	September 2	Electromagnetic Spectrum/Waves	Chapter 2
Week 3	<b>September 5</b>	<b>Labor Day Holiday</b>	
	September 7	Spectrum and composition	Chapter 2
	September 9	Spectrum and motion	Chapter 2
Week 4	September 12	Telescopes	Chapter 2
	September 14	<b>Exam 1</b>	
	September 16	Ancient Astronomy	Chapter 3

Week 5	September 19	Copernicus and Galileo	Chapter 3
	September 21	Brahe and Kepler	Chapter 3
	September 23	Newton's laws and gravity	Chapter 3
Week 6	September 26	Solar System overview	Chapter 4
	September 28	Small bodies, Solar System formation	Chapter 4
	September 30	Earth in detail	Chapter 5
Week 7	October 3	Altering our planet - Climate change	Chapter 5
	October 5	<b>Exam 2</b>	
	October 7	Terrestrial planets – Mercury and Moon	Chapter 6
Week 8	October 10	Terrestrial planets – Venus, Mars	Chapter 6
	October 12	Giant planets - Jupiter and Saturn	Chapter 7
	October 14	Giants planets - Uranus and Neptune	Chapter 7
Week 9	October 17	Satellite Systems	Chapter 7
	October 19	Search for other planets	Chapter 4
	October 21	Life beyond Earth	Chapter 8
Week 10	October 24	The Sun as a star	Chapter 9
	October 26	<b>Exam 3</b>	
	October 28	The Sun's energy production	Chapter 9
Week 11	October 31	Structure of the Sun	Chapter 9
	November 2	Measuring stellar distances	Chapter 10
	November 4	Properties of distant stars	Chapter 10
Week 12	November 7	Organizing the stars	Chapter 10
	November 9	Basics of Stellar evolution	Chapter 11
	November 11	Low and medium mass stars	Chapter 11
Week 13	November 14	High mass stars	Chapter 12
	November 16	<b>Exam 4</b>	
	November 18	Stellar Systems	Chapter 13
Week 14	November 21	Our galaxy	Chapter 13
	November 23	Measuring distances to other galaxies	Chapter 14
	<b>November 25</b>	<b>Thanksgiving Holiday</b>	
Week 15	November 28	Other galaxies	Chapter 14
	November 30	The evolving of the universe	Chapter 15
	December 2	The big picture	Chapter 15
	December 5	<b>Exam 5</b>	

Scheduled Review Sessions TDB

Make-up exam TDB, during finals

### Stargazing at UT

The Astronomy Department provides opportunity for viewing the night sky from campus. You can improve your attendance record by participating in one of them. If

you like it, you can go back again but you can make up only for one missed class. All you need to know can be found at:

<http://outreach.as.utexas.edu/public/viewing.html>