

South Plains College
Common Course Syllabus: ASTR 1403
Revised 07/26/2021

Department: Science

Discipline: Astronomy

Course Number: ASTR 1403

Course Title: Stars and Galaxies

Available Formats: conventional

Campuses: Levelland

Instructor:

David Hobbs

Office: S67

Office Hours: MW 8:30 – 11:00 am, F 8:30 – 11:30 am

Phone: 806-716-2639

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Course Description: Study of Stars, Galaxies, and the Universe outside our Solar System

Prerequisite: There are no prerequisites for this course, however you will be expected both on the homework and in the exams to be able to perform simple mathematical calculations.

Examples of the mathematical concepts we will use in this course are scientific notation, multiplying and dividing powers of 10, converting between different metric units, rearranging and solving simple equations. It will be assumed that you are familiar with high school algebra.

Credit: 4 **Lecture:** 3 **Lab:** 3

Textbook: Modified Mastering Astronomy with The Cosmic Perspective, 9th Edition eText by Bennett et al. (Pearson, 2020)

This course partially satisfies a Core Curriculum Requirement:

Life and Physical Sciences Foundational Component Area (030)

Core Curriculum Objectives addressed:

- **Communications skills**—to include effective written, oral, and visual communication
- **Critical thinking skills**—to include creative thinking, innovation, inquiry, and analysis, evaluation and synthesis of information
- **Empirical and quantitative competency skills**—to manipulate and analyze numerical data or observable facts resulting in informed conclusions
- **Teamwork**—to include the ability to consider different points of view and to work effectively with others to support a shared purpose or goal

Student Learning Outcomes: Upon successful completion of this course students will:

1. Describe key features of the universe, its scale, our place in it, and the physical principles relevant to astronomy.
2. Understand basic principles of physics that allow astronomers to learn about the universe.
3. Apply quantitative reasoning to solve a variety of astronomical problems.
4. Explain the principles and uses of telescopes in astronomy.

5. Describe the classifications and lifecycles of stars.
6. Explain the basic classification of galaxies in terms of structure.
7. Discuss current theories of galaxy formation and evolution.
8. Describe the spatial distribution of galaxies within the Universe.
9. Describe the evidence for the Big Bang as the origin of the Universe and the methods for estimating the age of the Universe.
10. Discuss experimental observations leading to the ideas of Dark Matter and Dark Energy and current theories for explaining these observations.

Student Learning Outcomes Assessment: Selected questions on the comprehensive final exam will assess how well students have met targeted student learning outcomes.

Course Evaluation: Student grades will be based on Mastering Astronomy quizzes, homework, class participation, observing sessions, two tests during the semester, and a comprehensive final exam. Final grades will be assigned based on overall, weighted average using the weighting scheme shown below:

Weighting Scheme	
Task	Weight
MA Quizzes	10%
Homework	10%
Class Participation	10%
Observing Sessions	10%
Test 1	15%
Test 2	20%
Final	25%

The letter grades will be based on a fixed scale as follows:

A: 89.5 – 100 B: 79.5 – 89.5 C: 69.5 – 79.5
 D: 59.5 – 69.5 F: below 59.5

Borderline cases (grades within 0.5 points of the break point) will be decided based on class attendance and participation.

Attendance Policy: Attendance and effort are vital to success in this course. Class attendance keeps you well connected to the course, so that you know at all times what's going on, what are the most important points, etc., and gives you opportunities to ask questions and clear up confusions. Therefore, students are expected to be in attendance for every class session. During classes, we will engage in discussions and various activities, some of which may involve completing worksheets. Participation in these activities will form part of your final grade.

MA Quizzes: The Mastering Astronomy quizzes will consist of 25 multiple choice questions completed online. The questions on these quizzes will come from the reading, concept, and visual quizzes located in the study area of Mastering Astronomy. You may work the quizzes in the study area as many times as you want in preparation for taking the graded quiz assignment. You may also attempt the graded quiz assignment up to 5 times and your best score will be counted. Note that the set of 25 questions selected from the quizzes in the study area will be different each time you retake the graded quiz.

Homework: You will complete 6 homework assignments. *Late homework will be accepted only if you have made prior arrangements and there is a very good reason for the lateness.*

Observing Sessions: Four observing sessions are scheduled as shown on the course calendar. You are required to attend at least one of these observing sessions and complete the observing worksheet that will be given to you when you arrive.

Can I get the grade I really want?

Yes – but it will depend on your effort. It does not matter whether you have even learned anything about astronomy before or whether you are “good” in science. What does matter is your willingness to work hard. Astronomy is a demanding course, in which we will move quickly and each new topic will build on concepts covered previously. If you fall behind at any time, you will find it extremely difficult to get caught back up. If you want to get a good grade in this class, be sure to pay special attention to the following:

- Carefully read the section in your textbook called “How to Succeed in Your Astronomy Course.” It describes how much time you should expect to spend studying outside class and lists a number of useful suggestions about how to study efficiently.
- When you turn in assignments of any kind, make sure they are done clearly and carefully as described in the “How to Succeed” subsection called “Presenting Homework and Writing Assignments”.
- Don’t procrastinate. The homework assignments will take you several hours, so if you leave them to the last minute, you’ll be in trouble—and it will be too late for you to ask for help. Both quizzes and homework need to be completed on time to earn credit.
- Don’t miss class, and make sure you come to class prepared, having completed the assignments due by that date.
- Don’t be a stranger to your instructor—come see me in office hours, even if you don’t have any specific questions.
- If you find yourself confused or falling behind for any reason at any time, let me know immediately! No matter what is causing your difficulty, I am quite willing to work with you to find a way for you to succeed—but I can’t help if I don’t know there’s a problem.

All the hard work described above might sound a bit intimidating, but I can make you this promise: Few topics have inspired humans throughout the ages as much as the mysteries of the heavens. This class offers you the opportunity to explore these mysteries in depth, learning both about our tremendous modern understanding of the universe and about the mysteries that remain. If you work hard and learn the material well, this class will be one of the most rewarding classes of your college career.

Plagiarism and Cheating: Students are expected to do their own work on all projects, quizzes, assignments, examinations, and papers. Failure to comply with this policy will result in an F for the assignment and can result in an F for the course if circumstances warrant.

Plagiarism violations include, but are not limited to, the following:

1. Turning in a paper that has been purchased, borrowed, or downloaded from another student, an online term paper site, or a mail order term paper mill;
2. Cutting and pasting together information from books, articles, other papers, or online sites without providing proper documentation;
3. Using direct quotations (three or more words) from a source without showing them to be direct quotations and citing them; or
4. Missing in-text citations.

Cheating violations include, but are not limited to, the following:

1. Obtaining an examination by stealing or collusion;
2. Discovering the content of an examination before it is given;
3. Using an unauthorized source of information (notes, textbook, text messaging, internet, apps) during an examination, quiz, or homework assignment;
4. Entering an office or building to obtain unfair advantage;
5. Taking an examination for another;
6. Altering grade records;
7. Copying another's work during an examination or on a homework assignment;
8. Rewriting another student's work in Peer Editing so that the writing is no longer the original student's;
9. Taking pictures of a test, test answers, or someone else's paper.

Student Code of Conduct Policy: Any successful learning experience requires mutual respect on the part of the student and the instructor. Neither instructor nor student should be subject to others' behavior that is rude, disruptive, intimidating, aggressive, or demeaning. Student conduct that disrupts the learning process or is deemed disrespectful or threatening shall not be tolerated and may lead to disciplinary action and/or removal from class.

Diversity Statement: In this class, the teacher will establish and support an environment that values and nurtures individual and group differences and encourages engagement and interaction. Understanding and respecting multiple experiences and perspectives will serve to challenge and stimulate all of us to learn about others, about the larger world and about ourselves. By promoting diversity and intellectual exchange, we will not only mirror society as it is, but also model society as it should and can be.

Disability Statement: Students with disabilities, including but not limited to physical, psychiatric, or learning disabilities, who wish to request accommodations in this class should notify the Disability Services Office early in the semester so that the appropriate arrangements may be made. In accordance with federal law, a student requesting accommodations must provide acceptable documentation of his/her disability to the Disability Services Office. For more information, call or visit the Disability Services Office at Levelland (Student Health & Wellness Office) 806-716-2577, Reese Center (Building 8) 806-716-4675, or Plainview Center (Main Office) 806-716-4302 or 806-296-9611.

Nondiscrimination Policy: South Plains College does not discriminate on the basis of race, color, national origin, sex, disability or age in its programs and activities. The following person has been designated to handle inquiries regarding the non-discrimination policies: Vice President for Student Affairs, South Plains College, 1401 College Avenue, Box 5, Levelland, TX 79336. Phone number 806-716-2360.

Title IX Pregnancy Accommodations Statement: If you are pregnant, or have given birth within six months, Under Title IX you have a right to reasonable accommodations to help continue your education. To [activate](#) accommodations you must submit a Title IX pregnancy accommodations request, along with specific medical documentation, to the Director of Health and Wellness. Once approved, notification will be sent to the student and instructors. It is the student's responsibility to work with the instructor to arrange accommodations. Contact the Director of Health and Wellness at 806-716-2362 or [email cgilster@southplainscollege.edu](mailto:cgilster@southplainscollege.edu) for assistance.

Covid Statement:

If you are experiencing any of the following symptoms please do not attend class and either seek medical attention or get tested for COVID-19.

- Cough, shortness of breath, difficulty breathing
- Fever or chills
- Muscles or body aches
- Vomiting or diarrhea
- New loss of taste and smell

Please also notify DeEtte Edens, BSN, RN, Associate Director of Health & Wellness, at dedens@southplainscollege.edu or 806-716-2376.

Note: The instructor reserves the right to modify the course syllabus and policies, as well as notify students of any changes, at any point during the semester.

Calendar

Astr 1403.001

Fall 2021

Week	Tuesday		Thursday	
	Readings	Topics	Readings	Topics
1	08/31	First day of class	09/02 Ch 1	Our Cosmic Address – Where (and when) are we in the universe?
2	09/07 Ch 1 Quiz	Spaceship Earth – What is our motion through space?	09/09 Ch 2 Ch 2 Quiz	The Night Sky – What does the universe look like from Earth? Observing Session 9 – 11 pm
3	09/14 Ch 3 Ch 3 Quiz	Ancient Roots of Astronomy	09/16 Ch 4 Ch 4 Quiz	Motion, Energy, Conservation Laws
4	09/21	Universal Law of Gravitation Homework 1 due	09/23 Ch 5 Ch 5 Quiz	Light and Matter
5	09/28	Cosmic Messenger – Reading the Information in Light	09/30 Ch 14 Ch 14 Quiz	Sun’s Structure and Energy Source Observing Session 8 – 10 pm
6	10/05	Sun’s Impact on Earth, Solar Cycles Homework 2 due	10/07	Test 1 – Chapters 1 through 5
7	10/12 Ch 15 Ch 15 Quiz	Classifying Stars – Luminosity, Temperature, Mass	10/14	Patterns Among Stars – H-R Diagram
8	10/19 Ch 16 Ch 16 Quiz	Stellar Birth - Where do stars form?	10/21	Stellar Birth – What is the process of star formation? Homework 3 due
9	10/26 Ch 17 Ch 17 Quiz	Lives of Low Mass Stars	10/28	Lives of High Mass Stars Observing Session 8 – 10 pm
10	11/02 Ch 18 Ch 18 Quiz	Stellar Corpses - White Dwarfs and Neutron Stars	11/04	Black Holes, Gamma-Ray Bursts, and Gravitational Waves
11	11/09 Ch 19 Ch 19 Quiz	Our Galaxy – The Milky Way	11/11	Formation of the Milky Way Homework 4 due
12	11/16 Ch 20 Ch 20 Quiz	Characteristics and Distances of Galaxies	11/18	Test 2 – Chapters 14 through 18
13	11/23 Ch 21 Ch 21 Quiz	Galaxy Formation and Evolution	11/25	Thanksgiving – No Class
14	11/30	Active Galactic Nuclei and Supermassive Black Holes Homework 5 due	12/02 Ch 22 Ch 22 Quiz	The Big Bang – Birth of the Universe Observing Session 8 – 10 pm
15	12/07 Ch 23 Ch 23 Quiz	Dark Matter and Dark Energy	12/09	Are We Alone? – Life Elsewhere in the Universe Homework 6 due
16	12/14		12/16	Final Exam – 8:00 to 10:00 am