

**South Plains College**  
**Common Course Syllabus: ASTR 1403**  
**Revised 07/28/2023**

**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

email: [dhobbs@southplainscollege.edu](mailto:dhobbs@southplainscollege.edu)

**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:** *The Essential Cosmic Perspective, 9<sup>th</sup> Edition* by Bennett et al. (Pearson, 2022).

The textbook and Mastering Astronomy learning platform will be available through Blackboard.

**Supplies:** Scientific Calculator

**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. Describe the classifications and lifecycles of stars.
5. Explain the basic classification of galaxies in terms of structure.
6. Discuss current theories of galaxy formation and evolution.
7. Describe the spatial distribution of galaxies within the Universe.
8. Describe the evidence for the Big Bang as the origin of the Universe and the methods for estimating the age of the Universe.
9. 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 tests will assess how well students have met targeted student learning outcomes.

**Course Evaluation:** Student grades will be based on daily work, homework, and tests. Final grades will be assigned based on the percentages shown below:

Task	Weight
Daily Work	25%
HW & Tests	75%

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 (within 0.5 of the break) will be decided based on class participation.

**Attendance Policy:** Attendance and effort are vital to success in this course. Class attendance keeps you well connected to the course and gives you opportunities to ask questions and clear up confusions. Therefore, students are expected to be in attendance for every class session. Students with excessive absences (more than 5) will be administratively dropped from the class. It is the student's responsibility to know how many absences they have accumulated.

**Daily Work:** Daily work consists of Mastering Astronomy quizzes and in-class (lab) practice with feedback. These activities are meant to be formative exercises and are graded primarily on participation. Their purpose is to help develop understanding of the concepts and principles and to prepare you for the tests.

**MA Quizzes:** The Mastering Astronomy quizzes will consist of *reading questions, concept questions, and visual questions*. Each quiz will be due approximately one week after class discussion of the chapter. The questions on these quizzes are available 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. You may also attempt the graded quiz assignment up to 3 times and your best score will be counted.

**Daily Work Grade Determination:** 50% of your daily work grade will come from the Mastering Astronomy quizzes and 50% from the in-class practice.

**Homework:** Do your homework! There is no substitute. Students who don't put in a good effort often struggle in the course. Homework will be assigned and graded online. A better semester average homework grade will replace your lowest test score.

**Tests:** Three tests will be given during the semester as shown on the course calendar. Each test will be worth 25% of the course grade. There will be no make-up tests given, so a test missed counts as zero. However, your lowest test grade will be replaced automatically by a greater semester average homework score at the end of the semester. Thus, in addition to demonstrating your grasp of the subject and helping you to prepare for tests, a good homework grade provides "insurance" against a low or missing test grade.

### **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 quizzes and 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 (grade of zero) 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.

**For information regarding official South Plains College statements about intellectual exchange, disabilities, non-discrimination, Title IX Pregnancy Accommodations, CARE Team, and Campus Concealed Carry, please visit <https://www.southplainscollege.edu/syllabusstatements/>.**

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

Fall 2023

Week	Tuesday		Thursday	
	Readings	Topics	Readings	Topics
1	08/29 <b>Appendix C</b>	Course Intro – Blackboard, Mastering Astronomy; Review of Scientific Notation	08/31 <b>Ch1.1</b>	Our Cosmic Address – Where are we in the universe?  Lab1 – Scale Model of the Earth and Moon
2	09/05 <b>Ch1.2</b>	Cosmic Time – When are we in the universe?  Lab2 – Scale Model of the Solar System	09/07 <b>Ch1.3</b> <b>Ch2.1</b>	Spaceship Earth – What is our motion through space and what’s the view like from our vantage point on spaceship Earth?  Lab3 – Scale Model of the Sun and Nearest Stars
3	09/12 <b>Ch4.1-3</b>	Motion, Energy, Conservation Laws  Lab4 – Moon Phases (1 <sup>st</sup> part of Ch2.3)	09/14 <b>Ch4.4</b>	Newton’s Universal Law of Gravitation  Lab5 – Energy Tutorial
4	09/19 <b>Ch5.1</b>	Light and Matter  Lab6 – Types of Light Spectra	09/21 <b>Ch5.2</b>	Cosmic Messenger – Reading the Information in Light  Lab7 – Thermal Radiation
5	09/26 <b>Ch11.1-2</b>	Sun’s Structure and Energy Source  Lab8 – Structure of the Sun	09/28 <b>Ch11.3</b>	Solar Activity and the Sunspot Cycle  Lab9 – Nuclear Fusion in the Sun
6	10/03	Review for Test 1	10/05	<b>Test 1 – Chapters 1, 2, 4, 5</b>
7	10/10 <b>Ch12.1</b>	Classifying Stars – Luminosity, Temperature, Mass  Lab10 – Stellar Luminosity and Apparent Brightness	10/12 <b>Ch12.2-3</b>	Patterns Among Stars – H-R Diagrams  Lab11 – H-R Diagram, part 1
8	10/17 <b>Ch13.1-2</b>	Stellar Birth; Life Cycle of a Low-Mass Star  Lab12 – H-R Diagram, part 2	10/19 <b>Ch13.3-4</b>	Life Cycle of a High-Mass Star  Lab13 – Star Cluster Age Determination
9	10/24 <b>Ch14.1-2</b>	Stellar Corpses – White Dwarfs and Neutron Stars  Lab14 – Stellar Evolution	10/26 <b>Ch14.3-4</b>	Black Holes, Gamma-Ray Bursts, and Gravitational Waves  Lab15 – Black Holes
10	10/31 <b>Ch15.1-2</b>	Our Home Galaxy – The Milky Way  Lab16 – Scale Model of the Local Group	11/02 <b>Ch15.3-4</b>	Formation of the Milky Way  Lab17 – The Galactic Center
11	11/07	Review for Test 2	11/09	<b>Test 2 – Chapters 11, 12, 13, 14</b>
12	11/14 <b>Ch16.1-2</b>	Characteristics and Distances of Galaxies  Lab18 – Cosmic Distance Scales	11/16 <b>Ch16.3-4</b>	Galaxy Formation and Evolution  Lab19 – Hubble’s Law
13	11/21 <b>Ch17.1-2</b>	The Big Bang – Birth of the Universe  No Lab	11/23	Thanksgiving – No Class
14	11/28 <b>Ch17.3-4</b>	Explaining Key Features of the Universe – Inflation  Lab20 – Big Bang Timeline	11/30 <b>Ch18.1-2</b>	Dark Matter and the Large-Scale Structure of the Universe  Lab21 – Detecting Dark Matter
15	12/05 <b>Ch18.3-4</b>	Dark Energy and the Fate of the Universe  Lab22 – Fate of the Universe	12/07 <b>Ch19.3-5</b>	Are We Alone? – Life Elsewhere in the Universe  Review for Test 3
16	12/12		12/14	<b>Test 3 – Chapters 15, 16, 17, 18, 19</b> <b>8:00 – 10:00 am</b>

This schedule may be subject to change. Any necessary changes will be announced in class and through Blackboard.