

Syllabus: ASTR 170B1, Fall 2022
Exploring Our Universe
Section 001: MWF, 10:00-10:50am
Rm. N210, Steward Observatory

1. Instructor

Name	Office Hours	Email
Professor: Chris Walker	TTh 3-4	cwalker@as.arizona.edu
TA: Del Spangler	MW 11-12	dspangler@email.arizona.edu

The course website can be found at <http://www.d21.arizona.edu>.

2. Learning Outcomes

ASTR 170B1 is an Exploring Perspectives: Natural Scientist course in the new University of Arizona General Education program with the Quantitative Reasoning Attribute. We will be using the **investigation of life in the universe** as a unifying theme.

Upon completion of this course, students will be able to:

- identify the approaches and methodologies of Natural Scientists, using evidence to critically analyze questions and arguments, and consider contributions of this perspective to finding solutions to global and/or local challenges. (Exploring Perspectives: Natural Scientist SLO)
- demonstrate competency in working with numerical information by critically analyzing quantitative information, generate ideas that are supported by quantitative evidence, assess the relevance of data and its associated implications in a variety of contexts, and communicate those ideas and/or associated interpretations using various formats (graphs, data tables, equations, oral presentations, or written reflections. (Quantitative Reasoning Attribute SLO)

Please note: This course will also fulfill Tier 1 – NATS General Education requirements for those students completing degree programs in catalogs prior to Fall 2022.

3. Course Objectives

1. Practice taking the unique perspectives of the astronomer.
2. Apply the perspective of the astronomer to understand and evaluate our current concepts of the structure and scale of our Universe.
3. Demonstrate knowledge of the physical processes (e.g., gravity, nuclear reactions, light) that operate in our Universe and use this knowledge to draw conclusions from data that answer astronomical questions.

4. Communicate ideas in various ways including verbally, with drawings, diagrams, in writing, and in quantitative formats such as graphs, tables and equations.
5. Critically analyze astronomical data presented in various quantitative formats to identify inconsistencies, contradictions & inaccuracies.
6. Collaborate with their peers to analyze, evaluate, and interpret these data.
7. Summarize and evaluate competing arguments that have been made to explain astronomical phenomena.
8. Engage in discourse, develop explanatory models, and make scientific predictions.
9. Discern the meaning of discipline representations and develop discipline fluency.
10. Reflect on the role and importance and contributions of science and astronomy in our society

4. Course Work and Grading Policies

Grading will be based on a percentage of final points as follows:

90-100%	A
80-89.9%	B
70-79.9%	C
60-69.9%	D

The percentage breakdown will be as follows:

3 Midterms (drop one):	$2 \times 15\% = 30\%$
1 Final:	$1 \times 20\% = 20\%$
4 Labs:	$4 \times 10\% = 40\%$
Individual Reports	$2 \times 2.5\% = 5\%$
Class Participation:	$5\% = 5\%$

5. Required Exams

There are three **midterms** and a **final**. The lowest midterm score will be automatically dropped. There are no make-up exams, except with a written University or doctor's excuse.

Dates:

Midterm 1: Wednesday, Sept. 14th

Midterm 2: Wednesday, Oct. 12th

Midterm 3: Wednesday, Nov. 9th

Final Exam: Friday, Dec. 9th, 10:30am

6. Lab Exercises

There will be 4 take-home lab exercises. Every student is expected to do each lab exercise. Each lab exercise will be worth 10% of your final grade. The midterms may have questions on them

pertaining to the lab exercises, so you should be sure to understand what you turn-in. These labs will be assigned in class and are to be turned-in on D2L by the date specified in class. **NO LATE WORK WILL BE ACCEPTED.**

7. Individual Reports

Each student will write two short (~2 page) reports or conduct an experiment concerning a course related topic they find particularly interesting. Please check with the instructor or TA beforehand to make sure the subject matter will be acceptable. Reports will be turned-in on D2L. The first report is due Oct. 5th. The second report is due Dec. 7th.

8. Course Materials

Things you may want to have in order to make the course easier:

1. A class notebook and pencil
2. A calculator with scientific notation
3. An inquiring mind

There is **no talking in class**. Since there is no formal textbook, students must be able to hear the instructor and take notes. Students are encouraged to ask the instructor questions during class. The instructor may call on students at random during class for their input and insights. Class participation (positive or negative) will be considered when computing final grades.

9. Absence Policies

Attending class and taking notes is an essential part of this course. The student is responsible for all material covered during the lectures. Missing lecture on a regular basis will result in a lower grade.

10. Academic Integrity

Presentation of any work other than your own is considered academic dishonesty. This includes copying test answers or lab assignments, other persons taking exams for you, or reference to any unauthorized materials during the exam. Any other technique that gains unfair advantage over other students is also considered academically dishonest. All students must be prepared to present valid picture identification if requested during an exam period. Any incidents of academic dishonesty will be dealt with according to the University of Arizona's Code of Academic Integrity. This Code can be viewed at the Dean of Students website:

<https://deanofstudents.arizona.edu/policies/code-academic-integrity>

The consequences can range from loss of credit on an assignment to dismissal from the University, depending on the severity of the offense. You should also be aware of the University's policies on disruptive and threatening behavior:

<https://deanofstudents.arizona.edu/disruptive-behavior>

11. Accessibility and Accommodation

At the University of Arizona, we strive to make learning experiences as accessible as possible. If you anticipate or experience barriers based on disability or pregnancy, please contact the Disability Resource Center (520-621-3268, <https://drc.arizona.edu>) to establish reasonable accommodations.

12. Approximate Course Outline and Calendar

- Week 1: From Big Bang to Atoms
- Week 2: From Molecules to Stars
- Week 3: Planet Formation; Earth's Origins
- Week 4: The Primordial Soup
- Week 5: Extrasolar Planets
- Week 6: Life in the Solar System
- Week 7: Darwinian Evolution
- Week 8: Origin of Intelligence
- Week 9: Human Evolution
- Week 10: Lifetime of a Civilization
- Week 11: How many others are out there?
- Week 12: How will we communicate with them?
- Week 13: Interstellar Conquest
- Week 14: First Contact
- Week 15: Review

Lectures are subject to change depending on the pace and interests of the class.