

# ASTR 201 - Cosmology

Fall 2022

Tier 2 Natural Sciences General Education

Tuesday/Thursday 12:30-1:45 pm

## 1. Overview

### Description of Course

Extragalactic astronomy and cosmology are among the fastest developing fields in astronomy. This course presents cosmology as a modern, quantitative science. It describes what we know about galaxies, the large scale structure of the universe and the beginnings and evolution of the Universe. We know quite a bit, assume a lot and have a great deal to learn.

### Course Prerequisites

Two courses from Tier One, Natural Sciences (Catalog numbers 170A, 170B, 170C)

### Instructor and Contact Information

Professor Daniel P. Marrone (he/him)

Office: Steward Observatory N314

Phone: 520-621-5175

Email: [dmarrone@arizona.edu](mailto:dmarrone@arizona.edu) (include "ASTR 201" in the subject line or your email may be lost)

Office Hours: Wednesday 11-12

Teaching assistant: Mr. Jiachuan Xu

Email: [jiachuanxu@arizona.edu](mailto:jiachuanxu@arizona.edu)

Office Hours: Tuesday and Friday 1:45-3:00

Course web page: <https://d2l.arizona.edu/d2l/home/1202527>

### Examination Dates

Midterm #1: September 22, in class

Midterm #2: October 27, in class

Final: December 14, 1-3pm

### Course Communications

Communication for this course will be conducted through official UA e-mail address and/or D2L.

Assignments will be available on D2L, and will be turned in there. Required readings will be posted on D2L.

### Required Textbook

This course uses a free online textbook published by [openstax](https://openstax.org). You may access the textbook here:

<https://openstax.org/details/books/astronomy-2e>, it is viewable online and downloadable as a free PDF.

### Course Format and Teaching Methods

This is primarily a lecture course, though with emphasis on interactivity and group learning during lecture. There will also be small group activities and lab activities during class period. Lectures will be recorded and posted to D2L on a best-effort basis.

## Course Objectives

This course will give you an up to date understanding of the universe, as best we know from modern science, and teach you how we have learned what we know. You will learn about the process by which we accumulate and interpret scientific data and develop scientific models to describe the world. You will learn about how models are tested, and how they have been rejected when their predictions have been inconsistent with the universe. You will understand the scale of the universe, and of other large and small numbers that confront us daily. You will see the physical meaning in graphs. You will be able to describe complex scientific theories in written and spoken words.

## Expected Learning Outcomes

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

- understand the nature and application of physical science
- apply ideas and processes beyond the classroom
- recognize the complexity of many scientific issues
- write about scientific knowledge
- appreciate the relative scale of objects
- critically analyze and interpret data and results presented in tables, graphs, and charts as well as perform appropriate mathematical calculations
- read and understand scientific literature from popular sources such as magazines and newspapers

## 2. Grading

### Grading Scale and Policies

Your grade will be determined from the following components:

Homework:	30%
In-class Activities	15%
Attendance and Daily Writing:	10%
Written Assignment	10%
Midterms:	20%
Final:	15%

The percentage thresholds for letter grades will be:

A = 90%    B= 80%    C=65%    D=50%

I reserve the right to make the grading slightly easier, but will not raise these thresholds.

### Incomplete (I) or Withdrawal (W):

Requests for incomplete (I) or withdrawal (W) must be made in accordance with University policies, which are available at <http://catalog.arizona.edu/policy/grades-and-grading-system#incomplete> and <http://catalog.arizona.edu/policy/grades-and-grading-system - Withdrawal> respectively.

### Homework

Homework assignments will be distributed in class and posted on D2L, approximately weekly. They will be turned in to D2L by the deadline in the appropriate submission box. These assignments are intended to reinforce topics from the course and to prepare you for midterm exams, so it is important to keep up with them. Late submissions will be penalized 10% per day, with a maximum penalty of 50%, until the start of the final exam.

Extra credit problems will be available to assist you in learning the material and to help improve your overall homework score. However, you may not receive more than 100% on the homework portion of your final grade.

### In-class Activities

On certain days, part or all of the lecture period will be used for group activities, sometimes with data collection. You will turn in assignments from these activities that will become part of your grade. It is critical that you attend lecture to participate in these activities. Excused absences will be accommodated in the grading of this portion of the class, be sure to notify me if you have an excused absence per the policies below.

### Attendance and Daily Writing

At the end of each lecture period there will be a short writing prompt. Each student will write to this prompt on a notecard (provided during lecture). These cards will allow us to take attendance, and the prompts will test your understanding, gather feedback on the course, and/or allow you to express your ideas about course topics.

### Written Assignment

All Tier One and Tier Two General Education Courses are writing intensive. In this course you will write a short essay about a cosmological topic based on a selection of source material written for non-scientist audiences. These essays will be peer-reviewed and revised before final grading.

### Midterm Examinations

There will be two midterms during the semester on **September 22 and October 27**. Each is 10% of your course grade.

### Final Examination

The **date and time of the final exam is December 14, from 1-3pm**, per the schedule set by the University. There is no makeup exam or alternate time for the final.

### Extra Credit

Occasional extra credit opportunities will be announced in class. They will have a value comparable to homework assignments. Your extra credit is capped at 4% of the course grade.

### Honors Credit

Because there is no standalone honors section for this course, students wishing to take this course for honors credit should contact Prof. Marrone as soon as possible. Honors contract information is available at <https://www.honors.arizona.edu/honors-contracts>. Honors contracts are due September 12<sup>th</sup>, and can only be filled out after defining a plan with Prof. Marrone.

## 3. Policies

### Absence and Class Participation Policy

The UA's policy concerning Class Attendance, Participation, and Administrative Drops is available at: <http://catalog.arizona.edu/policy/class-attendance-participation-and-administrative-drop>

The UA policy regarding absences for any sincerely held religious belief, observance or practice will be accommodated where reasonable, <http://policy.arizona.edu/human-resources/religious-accommodation-policy>.

Absences pre-approved by the UA Dean of Students (or Dean Designee) will be honored. See: <https://deanofstudents.arizona.edu/absences>

Participating in the course and attending lectures and other course events are vital to the learning process. As such, attendance is required at lectures. However, an important lesson of the pandemic is that you should stay home if you feel sick, and especially if you need to isolate or quarantine based on [University protocols](#).

Voluntary, free, and convenient [COVID-19 testing](#) is available for students on Main Campus. If you test positive for COVID-19 and you are participating in on-campus activities, you must report your results to Campus Health. To learn more about the process for reporting a positive test, visit the [Case Notification Protocol](#). Visit the [UArizona COVID-19](#) page for the most up-to-date information.

Contact Prof. Marrone if you will be missing a course meeting or an assignment deadline. Missing class does **not** guarantee an automatic extension of due date or rescheduling of examinations/assessments, you must contact me. To request a disability-related accommodation to this attendance policy, please contact the Disability Resource Center at (520) 621-3268 or [drc-info@email.arizona.edu](mailto:drc-info@email.arizona.edu). If you are experiencing unexpected barriers to your success in your courses, the Dean of Students Office is a central support resource for all students and may be helpful. The Dean of Students Office is located in the Robert L. Nugent Building, room 100, or call 520-621-7057.

### Makeup Policy for Students Who Register Late

Students who register after the first class meeting may make up missed work within the first two weeks.

### Dispute of Grade Policy:

Grades on papers or exams must be disputed within two weeks. After that, they are final.

### Preferred Gender Pronoun

This course affirms people of all gender expressions and gender identities. If you prefer to be called a different name than what is on the class roster, please let me know. Feel free to correct instructors on your preferred gender pronoun. If you have any questions or concerns, please do not hesitate to contact me directly in class or via email (instructor email). If you wish to change your preferred name or pronoun in the UAccess system, please use the following guidelines:

**Preferred name:** University of Arizona students may choose to identify themselves within the University community using a preferred first name that differs from their official/legal name. A student's preferred name will appear instead of the person's official/legal first name in select University-related systems and documents, provided that the name is not being used for the purpose of misrepresentation. Students are able to update their preferred names in UAccess.

**Pronouns:** Students may designate pronouns they use to identify themselves. Instructors and staff are encouraged to use pronouns for people that they use for themselves as a sign of respect and inclusion. Students are able to update and edit their pronouns in UAccess.

More information on updating your preferred name and pronouns is available on the Office of the Registrar site at <https://www.registrar.arizona.edu/>.

### Classroom Behavior Policy

To foster a positive learning environment, students and instructors have a shared responsibility. We want a safe, welcoming, and inclusive environment where all of us feel comfortable with each other and where we can challenge ourselves to succeed. To that end, our focus is on the tasks at hand and not on extraneous activities (e.g., texting, chatting, reading a newspaper, making phone calls, web surfing, etc.). I

understand that some learning styles are best served by using personal electronics, such as laptops and iPads. These devices can be distracting to other learners. Therefore, students who prefer to use electronic devices for note-taking during lecture will be seated together near the front of the lecture hall.

Students who are distracting themselves or others in any of these ways will be asked to leave the classroom and will lose participation points.

### Threatening Behavior Policy

The UA Threatening Behavior by Students Policy prohibits threats of physical harm to any member of the University community, including to oneself. See <http://policy.arizona.edu/education-and-student-affairs/threatening-behavior-students>.

### Nondiscrimination and Anti-harassment Policy

The University of Arizona is committed to creating and maintaining an environment free of discrimination. In support of this commitment, the University prohibits discrimination, including harassment and retaliation, based on a protected classification, including race, color, religion, sex, national origin, age, disability, veteran status, sexual orientation, gender identity, or genetic information. For more information, including how to report a concern, please see <http://policy.arizona.edu/human-resources/nondiscrimination-and-anti-harassment-policy>

Our classroom is a place where everyone is encouraged to express well-formed opinions and their reasons for those opinions. We also want to create a tolerant and open environment where such opinions can be expressed without resorting to bullying or discrimination of others.

### Code of Academic Integrity

Students are encouraged to share intellectual views and discuss freely the principles and applications of course materials. However, graded work/exercises must be the product of independent effort unless otherwise instructed. Students are expected to adhere to the UA Code of Academic Integrity as described in the UA General Catalog. See: <http://deanofstudents.arizona.edu/academic-integrity/students/academic-integrity>.

The University Libraries have some excellent tips for avoiding plagiarism, available at <http://new.library.arizona.edu/research/citing/plagiarism>.

Selling class notes and/or other course materials to other students or to a third party for resale is not permitted without the instructor's express written consent. Violations to this and other course rules are subject to the Code of Academic Integrity and may result in course sanctions. Additionally, students who use D2L or UA e-mail to sell or buy these copyrighted materials are subject to Code of Conduct Violations for misuse of student e-mail addresses. This conduct may also constitute copyright infringement.

Lecture recordings, which are created at the discretion of the instructor, must be accessed in D2L only. Students may not modify content or re-use content for any purpose other than personal educational reasons. All recordings are subject to government and university regulations. Therefore, students accessing unauthorized recordings or using them in a manner inconsistent with [UArizona values](#) and educational policies ([Code of Academic Integrity](#) and the [Student Code of Conduct](#)) are also subject to civil action.

### Subject to Change Statement

Information contained in the course syllabus, other than the grade and absence policy, may be subject to change with advance notice, as deemed appropriate by the instructor.

## 4. Resources

### Accessibility and Accommodations

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.

### Additional Resources for Students

UA Academic policies and procedures are available at <http://catalog.arizona.edu/policies>

#### **Campus Health**

<http://www.health.arizona.edu/>

Campus Health provides quality medical and mental health care services through virtual and in-person care.

Phone: 520-621-9202

#### **Counseling and Psych Services (CAPS)**

<https://health.arizona.edu/counseling-psych-services>

CAPS provides mental health care, including short-term counseling services.

Phone: 520-621-3334

#### **The Dean of Students Office's Student Assistance Program**

<http://deanofstudents.arizona.edu/student-assistance/students/student-assistance>

Student Assistance helps students manage crises, life traumas, and other barriers that impede success. The staff addresses the needs of students who experience issues related to social adjustment, academic challenges, psychological health, physical health, victimization, and relationship issues, through a variety of interventions, referrals, and follow up services.

Email: [DOS-deanofstudents@email.arizona.edu](mailto:DOS-deanofstudents@email.arizona.edu)

Phone: 520-621-7057

#### **Survivor Advocacy Program**

<https://survivoradvocacy.arizona.edu/>

The Survivor Advocacy Program provides confidential support and advocacy services to student survivors of sexual and gender-based violence. The Program can also advise students about relevant non-UA resources available within the local community for support.

Email: [survivoradvocacy@email.arizona.edu](mailto:survivoradvocacy@email.arizona.edu)

Phone: 520-621-5767

### Campus Pantry

Any student who has difficulty affording groceries or accessing sufficient food to eat every day, or who lacks a safe and stable place to live and believes this may affect their performance in the course, is urged to contact the Dean of Students for support. In addition, the University of Arizona Campus Pantry is open for students to receive supplemental groceries at no cost. Please see their website at: [campuspantry.arizona.edu](http://campuspantry.arizona.edu) for open times.

Furthermore, please notify me if you are comfortable in doing so. This will enable me to provide any resources that I may possess.