SCOTTSDALE COMMUNITY COLLEGE
A MARICOPA COMMUNITY COLLEGE

Course Information

Semester & Year:	Fall 2024
Course Title:	Introduction to Stars, Galaxies, and Cosmology
Course Prefix & Number:	AST112
Section Number:	12280 (Lecture) + 12583 (Lab)
Credit Hours:	4
Start Date:	08/19/2024
End Date:	12/13/2024
Room Number:	Online
Meeting Days:	N/A
Meeting Times:	N/A

Course Format: Online

Instructor Information

Instructor:	Dr. Carver Bierson
Email:	Carver.Bierson@Scottsdalecc.edu
Phone:	480-423-6018
Office Location:	NS 128
In-person Office Hours:	Tuesday 1pm-2pm and Friday 10am -12pm.
Online Office Hours:	Thursdays 1pm-3pm.

Course Description

Introduction to astronomy for the non-science major. Structure and evolution of stars; supernovae, black holes, and quasars; nebulae; star clusters; galaxies; cosmology, including the birth and death of the universe.

Prerequisites

A grade of C or better in MAT092 or higher, or satisfactory district placement.

Course Competencies

MCCCD Official Course Competencies

1. Apply the scientific method and other critical thinking models to astronomical phenomena for hypotheses development, experiment design, and data analysis. (I-VII)

2. Explain the application of fundamental physical principles to various astronomical phenomena. (II-VII)
3. Describe the features and motions of the celestial sphere and celestial objects and explain the causes of these motions. (II)
4. Describe in terms of energy, wavelength, and frequency the various portions of the electromagnetic spectrum and the optical instruments to be used to detect them. (III)
5. Describe and evaluate the physical properties of stars, classify them according to spectral type, and place them on a Hertzsprung-Russell diagram. (IV)
6. Explain the various methods of determining the distances to astronomical objects. (IV, VI, VII)
7. Use a Hertzsprung-Russell diagram to describe the stages in the formation, evolution, death, and remnants of low and high-mass stars. (V)
8. Describe and characterize the interstellar medium.(V)
9. Describe the structure and scale of the Milky Way galaxy and explain the observational evidence for that structure. (VI)
10. Describe the properties of different galaxy types and how these properties affect the observational characteristics of galaxies. (VI)
11. Explain the observations and power mechanisms for active galaxies. (VI)
12. Describe dark matter, including its observational characteristics, how it affects galaxy dynamics, and possible sources and alternative theories. (VI)

13. Describe Hubble`s Law, its implications for observational astronomy, and its importance in understanding the dynamics, physical properties, and evolution of the Universe. (VII)
14. Describe the stages in the birth and possible end states of the Universe. (VII)
15. Describe dark energy, including its observational characteristics, how it affects the dynamics of the Universe, and possible sources and alternative theories. (VII)

Texts and Course Materials

For this class we will be using the **free** OpenStax Astronomy textbook. You can access the entire textbook online for free and can download a full pdf for free. If you wish you may order a physical copy from OpenStax but that is not required.

Astronomy

- **Author:** Andrew Fraknoi, David Morrison, Sidney Wolff
- **Publisher:** Openstax
- **Edition:** 2nd
- **Website:** https://openstax.org/details/books/astronomy-2e
- **Price:** Free

Course Technologies

View the Accessibility Statements & Privacy Policies of technologies used in this course.

Maricopa Systems

This course uses key Maricopa systems for course management and communication.

- Canvas Learning Management System
- Student Maricopa Gmail Account
- Maricopa Open Educational Resource Learning System (MOER)

Student Assignment Tools

This course requires students to participate in or submit assignments using desktop or cloud-based applications.

- Google Products (Google sheets)

Plagiarism Checker Tool (Turnitin)

Turnitin is a plagiarism check tool that matches text to a vast database of sources including the internet, published works, commercial databases and student work submitted to Turnitin in institutions internationally. Students must submit designated papers to Turnitin when instructed. Information and instructions for Turnitin are provided in the course. For your reference, read the Turnitin Terms of Service.

Course Policies

The following are policies specific to this course. Students are also responsible for the college policies included on the Student Regulations page of the Maricopa Community College District website.

Generative Artificial Intelligence (AI) Policy

Opening Statement Regarding Generative Artificial Intelligence (AI)

The World Economic Forum defines generative AI as “a category of artificial intelligence (AI) algorithms that generate new outputs based on the data they have been trained on. Unlike traditional AI systems that are designed to recognize patterns and make predictions, generative AI creates new content in the form of images, text, audio, and more.”

Some examples of generative AI tools include but are not limited to: ChatGPT, Google Bard, Microsoft Copilot, Stable Diffusion, GrammarlyGo, and Adobe Firefly.

No Generative Artificial Intelligence (AI) Allowed

In this class, all work submitted must be your own. The use of generative AI tools will be considered academic misconduct (see Administrative Regulation 2.3.11 1.B(b)) and will be treated as such. If you are unsure if the tool or website you are using is a generative AI tool, please contact the instructor for further clarification before using the tool or website.

Plagiarism

Plagiarism is a form of cheating in which a student falsely represents another person’s work as their own – it includes, but is not limited to: (a) the use of paraphrase or direct quotation of the published or unpublished work of another person without full and clear acknowledgment; (b) unacknowledged use of materials prepared by another person or

agency engaged in the selling of term papers or other academic materials; and (c) information gathered from the internet and not properly identified.

Academic Consequences
Any student found by a faculty member to have committed academic misconduct may be subject to the following academic consequences, based on the faculty member's judgment of the student's academic performance:

1. Warning - A notice in writing to the student that the student has violated the academic standards as defined above.
2. Grade Adjustment - Lowering of a grade on a test, assignment, or course.
3. Discretionary assignments - Additional academic assignments determined by the faculty member.
4. Course Failure - Failure of a student from a course where academic misconduct occurs.

How to avoid plagiarism:

1. Always put content into your own words (don't copy and paste). If you do want to use the exact wording from a source it must be in quotation marks.
2. Cite your sources. Say where you got your information.

Grading Standards & Practices

Grade Scale

Your grade in this course is based fully on the number of points you receive (not a percentage). See the table below for how your total points describes your final grade.

Letter Grade	Points Range
A	900+
B	800-899
C	700-799
D	600-699
F	Less than 600

Assignments

Assignment Name	Points for each	Number of assignments	Total Points
Reading quizzes	10	16	160
Reading 3-2-1 Summaries	10	16	160

Discussions	10	14	140
Group Summaries 1 and 2	100	2	200
Final Group Summary	150	1	150
Lab section content			
Lab Assignment	20	8	160
Lab Data Sheets	5	8	40
Lab Reflection	5	8	40
Special Assignments			
Class pre and post test	10	2	20
First day attendance	5	1	5
TOTAL:			**1075**

Assignment Deadlines: No Late Submissions Are Accepted

In this class, each weeks standard assignments are worth 60 points. There are 75 extra points built into this class. This is there as a buffer if you miss some assignments for any reason.

If there are extenuating circumstances you may reach out to me. Contact me **before** the due date and ask for an extension. I will consider each request on a case-by-case basis. Late assignments approved by me in advance will not be penalized.

Class Calendar

Week	Topics	Major Assignments
1	What is Astronomy	
2	The Night Sky	Lab 1
3	Light and Spectra	
4	Telescopes	Lab 2
5	The Spectra of Stars	Group Summary 1

6	Star types and distances	Lab 3
7	Dust between the stars	
8	Birth of Stars	Lab 4
9	Evolution of Stars	
10	Death of Stars	Lab 5
11	Death of Stars	Group Summary 2
12	Black holes	Lab 6
13	Our Milky Way Galaxy	
14	Other Galaxies	Lab 7
15	The distribution of Galaxies	
16	The Big Bang	Lab 8, Final Group Summary

Response Time

Students can expect a response within of 24 hours (48 hours over a weekend or holiday) for the instructor to respond to messages sent via the Canvas Learning Management System or email. Students can expect assignments to be graded within 1-week of the assignment's due date.

I am often much faster than these times. If you don't hear from me within 24 hours and you expect a response, you are welcome to send me a follow-up message.

Attendance Policy

It is policy that students who do not attend the first class period are dropped from the course. In a fully online course that is asynchronous, I will use the first day that assignments are due to assess first data attendance: you must turn in the "First Day Attendance" quiz due on **Friday, Sep 6**, to demonstrate attendance on the first day. You may be dropped from the course if you do not complete and submit this simple assignment by MIDNIGHT Friday.

In accordance with college and district policies, students are expected to attend and be actively engaged in their classes whether instruction is provided face-to-face, online, or in a hybrid modality involving both synchronous and asynchronous components. In this course, students are allowed a maximum of **2 weeks unexcused absences**; after the 2nd week of unexcused absence, a student **may be withdrawn from the course** by the instructor. MCCCD Administrative Regulation 2.3.2 provides additional details on what is considered an official absence, and procedures for handling make-up work for approved exceptions

Instructional Contact Hours (Seat Time)

This is a three (4) credit-hour course. Plan to spend at least three hours on course content (reading and videos) and six hours on homework weekly. Additionally, the lab is expected to take 3 hours each week.

Suggested Tutoring (Natural Science)

Tutoring is available through the Natural Sciences Department. These tutors have access to our class assignments and so can help you much easier than an outside tutor. You can use this in a few different ways:

1. Go to the tutoring center as a place to work (room NS-107). You can do your assignments in this space and if you have questions someone is in the room to help. If they don't know the answer, my office is just down the hall. This is a great way to set aside time to work on this class (**particularly the labs**).
2. Go to the tutor center with questions. You can check the schedule for when a tutor is in and ask any questions you have had working through the class. While none of their tutors are listed for astronomy, any listed for physics (or even geology or chemistry) can help with most questions you will have.
3. Get tutoring online. You can directly contact a tutor online and get help fast with the problems you are working on.

Their website with all the information you need is at :
https://www.scottsdalecc.edu/students/tutoring/natural-sciences-tutoring-center

Online Tutoring (Campus wide)

SCC's tutors are available online to help with your courses. You may work with an SCC tutor remotely using Google Meet, your phone, or email. Visit the Tutoring & Learning

Centers page for detailed information on the five learning center's hours and procedures.

As much as possible, it is highly recommended that you utilize SCC tutors since they are more familiar with SCC coursework, instructor expectations, and assignments; however, if you need to work with a tutor outside regular hours, online and hybrid students now have access to a 24/7 online tutoring service called Brainfuse. Brainfuse provides online tutoring in a variety of academic subjects. Each student may utilize up to 6 hours of online tutoring through Brainfuse per semester, and has the option of requesting additional time if needed.

To access Brainfuse and begin working with a tutor:

1. Visit the SCC Online Tutoring Services Through Brainfuse page (https://www.scottsdalecc.edu/students/tutoring/online-tutoring)
2. Click the **Visit a tutor online** button
3. Enter your MEID and password
4. Choose your topic and subject
5. Click the **Connect** button

Please use your time effectively and be prepared with your questions before you connect to a tutor. Tutors and students communicate in real-time so whatever you type, draw, or share on the screen, the tutor sees, and vice versa. You may also want to have screenshots ready if applicable. All Brainfuse sessions are recorded for review later.

Students are responsible for the information contained in this syllabus, the Syllabus page in your Canvas course and the **College Policies & Student Services** page found in the First Steps module of your Canvas course. Students will be notified by the instructor of any changes in course requirements or policies.