

Astronomy S-120 Galaxies and the Universe
1:00-2:20 M-F

Class attendance is mandatory, attendance will be taken every day including July 4, and is 10% of the final mark.

Course Description:

For millennia, people have wondered about the origins of the Earth, Sun, planets, stars, and the band of light called the Milky Way. While great progress has been made, how the Universe evolved with time (Cosmology) and how galaxies formed in the evolving Universe are questions remaining at the cutting edge of modern astronomy. In this course, these subjects are explored once the necessary backgrounds in elementary astronomy and physics are developed. The only prerequisite is a working knowledge of elementary algebra.

Instructor: Robert Zinn
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Textbook: Universe: Stars and Galaxies 5th or 6th Edition
Roger A. Freedman et al., Publisher: W.H. Freeman

OR Universe 10th or 11th Edition ebook available
Roger A. Freedman et al., Publisher: W.H. Freeman

Weather permitting, there will be an evening observing session at the on-campus observatory. Date and time to be determined.

Outline

Week 1: The motions of the planets
Kepler's Laws, Newton's laws and theory of gravitation
The Nature of Light and Matter
Optics & Telescopes

Reading: Chapters 1, 4, 5, & 6

Week 2: Our Star, the Sun
The Nature of Stars
The Birth of Stars
Stellar Evolution
The Death of Stars
Neutron Stars

Reading: Chapters 16, 17, 18, 19, 20, 21

Week 3: Black Holes
Our Galaxy
Galaxies

Reading: Chapters 22, 23, & 24

Week 4: Quasars, Blazars, & Active Galaxies
Cosmology

Reading: Chapters 25 & 26

Week 5: Cosmology Continued
Exploring the Early Universe

Reading: Chapters 26

There will be 4 weekly quizzes and a final exam, which will be on the Fridays of each week. **You must attend the Final Exam on Friday, August 1th. No Exceptions** Also, 8-10 homework assignments. They are to be uploaded to Canvas.

Grading: 40% Quizzes
30% Final
20% Homework
10% Class attendance

There will be a discussion section for assistance with the homework and the class material.

Homework Policy

1. To receive any credit for a homework problem, you must show how you arrived at your answer (the answers to some problems are given at the back of the textbook).
2. The work you hand in must be your own. (NO copying or use of AI e.g., Chatgpt).
3. Late homework will be marked down 10 points for each class period that it is late. Homework later than two class periods will not be graded, and a zero will be recorded.
4. Homework will not be marked down if you are ill or have an emergency. Please notify me as soon as possible