

ASTR 117H: LIFE IN THE UNIVERSE - HONORS

Citrus College Course Outline of Record

Heading	Value
Effective Term:	Fall 2025
Credits:	3
Total Contact Hours:	54
Lecture Hours :	54
Lab Hours:	0
Hours Arranged:	0
Outside of Class Hours:	108
Total Student Learning Hours:	162
Prerequisite:	Student must be eligible for the Citrus College Honors Program or obtain a recommendation from an Honors instructor.
Strongly Recommended:	ENGL C1000.
District General Education:	B2. Physical Science
Transferable to CSU:	Yes
Transferable to UC:	Yes - Proposed
Grading Method:	Standard Letter

Catalog Course Description

The origin and evolution of life on Earth, the processes and conditions relevant to life elsewhere in the universe, and the ongoing search for extraterrestrial life. This is an honors course. 54 lecture hours.

Course Objectives

- Analyze generated and/ or archived datasets of extrasolar planetary systems.
- Describe relationships between the physical characteristics of astronomical bodies and their interior/ surface conditions.
- Appreciate the origin and diversity of Earth life through an understanding of geological and biological processes.
- Gain familiarity with the current status of and future possibilities for exploration of terrestrial and space environments.

Major Course Content

- Scope and Background of Astrobiology
- Earth's Place in the Universe
- The Cosmic Distance Scale
- Structure and Origin of the Solar System
- Formation of Earth's Atmosphere and Oceans
- Geology and Atmospheric Thermal Equilibrium
- Impacts and Mass Extinctions
- Origins and Characteristics of Chemical Elements
- Nutrients and Cell Structure/ Function
- Energy and Metabolism
- Physical and Chemical Properties of Water
- Geological and Biological Histories of Earth
- Extremophiles

- Mass, Gravity, and Habitability
- Human and Robotic Space Exploration
- Surface Conditions and Geological History of Mars
- The Search for Life on Mars
- Moons of Outer Planets
- The Habitable Zone
- Climate Change and Habitability
- Interstellar Travel
- Stellar Life Cycles
- Extrasolar Planets
- Technologically Advanced Life
- Interstellar Communication
- The Fermi Paradox

Suggested Reading Other Than Required Textbook

Phil Plait's Crash Course Astronomy www.youtube.com/playlist?list=PL8dPuualjXtPAJr1ysd5yGlyISFuh0mIL

Examples of Required Writing Assignments

Explain why or why not extraterrestrial life would require some type of cellular structure.

List arguments against young-earth creationism from i)astronomy ii) geology iii) microbiology iv) paleontology.

What is the Fermi Paradox and what, in your opinion, are some possible solutions?

Which of the 6-12 objects in this simulated planetary system would be most likely to support life, and why?

Examples of Outside Assignments

Research and present (orally and in writing) a topic of choice from Astronomy Picture of the Day at apod.nasa.gov.

Read one of the following picture books with a young relative, listing questions that were asked, answers given, as well as any discrepancies between the book and class material and how they were addressed.

Attend a planetarium show / lecture outside of class. Comment on which topics from the course were addressed and what, if anything, you would do to improve the presentation.

Participate in a citizen science initiative related to this course via Zooniverse.com.

Instruction Type(s)

Lecture