

ASTR 54H: HONORS INSTITUTE SEMINAR IN ASTRONOMY

Foothill College Course Outline of Record

Heading	Value
Effective Term:	Summer 2022
Units:	1
Hours:	1 lecture per week (12 total per quarter)
Corequisite:	ASTR 10BH.
Advisory:	Not open to students with credit in ASTR 34 or 34H.
Degree & Credit Status:	Degree-Applicable Credit Course
Foothill GE:	Non-GE
Transferable:	CSU
Grade Type:	Letter Grade (Request for Pass/No Pass)
Repeatability:	Not Repeatable

Student Learning Outcomes

- Students will be able to explain astronomical discoveries using core physical processes of astronomy.
- A successful student will demonstrate a good understanding of how to find reliable sources of astronomy information.

Description

In this honors seminar, students build upon topics covered in Astronomy lecture courses by developing a presentation, piece of writing, video, or some other creative piece to teach others about an astronomical phenomenon. The course emphasizes learning how to carry out effective background research, process that information for understanding, and refine that understanding by preparing material to explain the phenomena to others (i.e., "To teach is to learn twice over").

Course Objectives

The student will be able to:

- Identify reliable sources of information
- Test one's understanding and fill in gaps
- Break phenomena down into "minimally teachable" pieces
- Communicate phenomena in an audience-appropriate manner

Course Content

- Identify reliable sources of information
 - Using the Foothill library and librarians to find information for astronomy
 - Using the internet and distinguishing between reliable and unreliable astronomy and space science sources
 - Extrapolate from known phenomena to assess the reliability of new information
 - How to properly cite references
- Test one's understanding and fill in gaps
 - Ask "what if" questions and figure out the answer

- Predict outcome in alternative situations and look for evidence of those outcomes
- Break phenomena down into "minimally teachable" pieces
 - Outline the key facts and processes of a phenomenon
 - Identify the prerequisite knowledge and skills for each of those facts and processes
 - Make a concept map integrating physical properties, processes, and observations
- Communicate phenomena in an audience-appropriate manner
 - Use analogies or scale models to make scale and processes relatable
 - Use actions, animations, cartoons with "motion stripes," or clear descriptions to convey motion or process
 - Coach the audience in constructing their own understanding with "what if" questions and appropriate pause/feedback

Lab Content

Not applicable.

Special Facilities and/or Equipment

When taught as an online learning section, students and faculty need ongoing and continuous internet and email access.

Method(s) of Evaluation

Methods of Evaluation may include but are not limited to the following:

- Students will demonstrate proficiency at the honors level by:
- participating in the class discussion by asking and answering questions both in-person and in online discussions
 - producing a concept map and written description of an astronomical phenomenon
 - writing/drawing/recording/presenting an original honors-level presentation of a topic that includes use of elements that encourage active thought on the part of the target audience

Method(s) of Instruction

Methods of Instruction may include but are not limited to the following:

- The Honors seminar will focus on instruction and practice in science communication skills via:
- Lectures with integrated practice
 - Small group and classroom discussion
 - Peer review

Representative Text(s) and Other Materials

- Olson, Randy. [Don't Be Such a Scientist: Talking Substance in an Age of Style](#). 2nd ed. Island Press, 2018.
- Olson, Randy. [Houston, We Have a Narrative: Why Science Needs Story](#). University of Chicago Press, 2015.
- Bennett, Jeffrey. [On Teaching Science](#). Big Kid Science, 2014.
- Additional handouts from the instructor.

Types and/or Examples of Required Reading, Writing, and Outside of Class Assignments

- A. Reading assignments discussing learning and communication strategies
- B. Individualized, guided reading in the Foothill College library and on the web, in preparation for preparing the honors paper or presentation
- C. Write a technical description of an astronomical phenomenon to demonstrate detailed understanding
- D. Write an essay, blog-style post, cartoon, video, poster, spoken presentation, etc., to communicate that phenomenon in a target-appropriate manner

Discipline(s)

Physics/Astronomy