ASTR-C1000: INTRODUCTION TO ASTRONOMY WITH LAB

Effective Term
Fall 2026

BOT Approval Date
12/11/2025

Discipline
ASTR - Astronomy
Course Number
C1000

Course Title
Introduction to Astronomy with Lab

Short Title
Intro to Astronomy with Lab

Credit Status (CB 04)
D - Credit - Degree applicable

Units

Lecture Units
3.00

Lab Units
1.00

Total Units
4.00

Hours

Lecture Contact Hours
48-54
Out of Class Hours Lecture
96-108

Lab Contact Hours
48-54
Out of Class Hours Lab
0.00

Total Contact Hours
96 - 108

Total Out of Class Hours
96 - 108

Total Student Learning Hours
192 - 216

Is this an existing Extensive Lab?
Yes

Distance Education

Yes

Distance Education

Distance Education Type

Both Fully Online and Hybrid Online

Fully Online Delivery Requirements:
a. Students must be notified via the college schedule of classes and the syllabus for the class if proctored tests are required for this course
b. Any planned face-to-face meetings, such as an orientation or study session, must be optional
c. The MSJC curriculum committee requires the use of accessible, asynchronous discussion as a component of every fully online course

Are you using publisher content?

No

Regular Substantive Interaction

Instructor-to-student, student-to-student, and student-to-content contact shall be distributed in a manner that will ensure regular substantive interaction (RSI) is maintained not only weekly but also for the duration of the course. Instructor interactions should be equivalent in time, quality and consistency to the engagement students would receive in a face-to-face course—for example, through announcements, discussion participation, personalized feedback, video messages, or other instructional communications. Instructors are expected to be responsive to student inquiries within a 24-72 hour time frame excluding holidays. RSI will be maintained through a variety of methods: • Orientation - Students must be oriented to the online and face-to-face portions at the start of the course. • Announcements - Announcements using the course management system must be posted at least weekly to keep students current on course events, due dates, materials, etc. • Discussion Forums - Content-related discussion forums within the designated CMS will include appropriate instructor participation and will be initiated and maintained, with timely feedback provided. Instructors are required to monitor the discussions and related activities to provide guidance and direction. Open-ended discussion boards may be used to further learning and interaction. • MSJC Communication – Instructor will use MSJC-administered communication tools (such as email or the designated CMS communication tools) to regularly communicate with and provide ease of access to students. • Timely Feedback - Timely feedback on student work will be provided by the instructor, which may include comments and/or rubrics, within the Grades area of the designated CMS. • Scheduled Meetings – Hybrid and synchronous courses will meet at regularly scheduled times. ADA Compliance - All course interactions and content must be designed with accessibility in mind and meet ADA requirements.

Catalog Description

This course introduces fundamental concepts of astronomy, including the Solar System, stars, supernovae, galaxies, black holes, and the expanding universe. Students learn how to study the cosmos through experiments, observations, and/or simulations and discover what the latest science reveals about the origins and fate of the universe.

Codes

TOP Code (CB 03)

1911.00 - Astronomy

CIP Code

40.0201 - Astronomy.

Repeatability Code

No

Grading Option

Letter grade OR P/NP

Minimum Qualifications

Minimum Qualifications	And/Or
Physics/Astronomy (Masters Required)	End

GE Information

Check GE Types Requested
AA/AS A - Natural and Physical Sciences

Cal-GETC Areas

Approved Cal-GETC Area
AREA-5A

Approved Second Cal-GETC Area
AREA-5C

Learning Objectives

Learning Objectives

Learning Objective
1. Apply fundamental theoretical principles and evidence-based reasoning to explain how observations and data inform our current understanding of the universe and everyday phenomena.
2. Distinguish and compare the size, scale, and structure of astronomical objects.
3. Describe the diverse perspectives and contributions that have shaped humanity's understanding of the universe through the field of astronomy.
4. Collect, analyze, and interpret astronomical data to draw and communicate valid scientific conclusions.

Learning Outcome Information

Course Learning Outcomes

Learning Outcome
1. Students will describe the physical structure and processes governing the evolution of solar system objects, stars, galaxies and the universe.
2. Students will Identify celestial objects and their properties (Lab).
3. Students will employ astronomical instruments (Lab)
4. Students will measure and collect data from experiments (Lab)
5. Students will organize data and create appropriate lab reports (Lab)

Content

Course Lecture Content
1. Scientific method
2. Observing the sky
3. History of astronomy across cultures
4. Gravity, motion, and physical laws
5. Light, matter, and spectra
6. Telescopes
7. Analysis of light
8. Earth, Moon, Sun system
9. The Solar System and exoplanets
10. The Sun
11. Stars and stellar evolution
12. The Milky Way
13. Galaxies
14. Cosmology

15. Life in the universe

CCN Expanded Lecture Content

Additional topics that may be covered to maintain local articulation:

A) **Indigenous Astronomy** - Astronomy was a critical component that was developed and used in daily life in cultures such as the Mayans, Egyptians, Polynesians, Navajo and Aboriginal Australian peoples. Astronomy was used extensively in agriculture, navigation and in the spiritual beliefs of many of these cultures.

B) Creation of the American Astronomical Society Subcommittee on the Status of Minorities in Astronomy in 1997.

C) **Ethnoastronomy**: The study of how different cultures construct astronomical knowledge.

D) **Important People**: Benjamin Banneker, Harvey Washington Banks, Benjamin Peery, Arthur Walker Jr., Neil deGrasse Tyson, Gibor Basri, Chanda Prescod-Weinstein, Ashley Walker Jr., Nancy Roman, Cecilia Payne-Gaposchkin, Margaret Burbidge, Annie Jump Cannon, Henrietta Swan Levitt, Williamina Fleming, to name a few.

Course Lab Content

1. Celestial sphere
2. Orbits and Kepler's Laws
3. Spectroscopy
4. Lunar properties
5. Telescopes and optics
6. Hertzsprung-Russell Diagram
7. Sun features
8. Deep sky objects
9. Cosmic distance ladder

Methods of Instruction

Method

Activity

Integration

Collaborative learning activities in-class and out of class that encourage a deeper understanding of the relationships between the structure, function, and evolution, of matter in the universe in the forms of atoms, planetesimals, planets, stars, solar systems, galaxies, and the universe as a whole. These can include lecture/discussions, small group activities, or whole class activities.

DE Adaptations for MOI

Activities that encourage a deeper understanding of the relationships between the structure, function, and evolution of the universe and its components will be accomplished in the CMS using the assignment, peer review, discussion, and quiz/survey functions. All CMS functions will meet accessibility requirements.

Method

Discussion

Integration

Discussions may include content topics, concept-mapping exercises, graph interpretation, societal views, controversies, and ethics. Discussion topics could include the possibility of life in the universe, the unappreciated role of women in the discovery of how stars work, and the ethics of sending humans into space, versus intelligent machines.

DE Adaptations for MOI

The instructor will use the CMS to create threaded discussions to allow students to respond to a prompt and to one another. The topics require students to analyze, critique, and discuss a variety of astronomy topics including concept mapping exercises, graph interpretation, societal views of science, controversies, and ethics. The instructor monitors the discussions to assess student participation and understanding.

Method

Field Experience

Integration

Field experiences can involve the use of telescopes to view planets, stars, comets, galaxies, nebulae, and sunspots.

DE Adaptations for MOI

Field experiences can also be undertaken virtually using accessible simulations, accessible online museum exhibits, or accessible close captioned interactive videos. Field experience progress will be monitored using the CMS system.

Method

Lab Activities

Integration

Hypothesis driven experimental laboratory study of lab content will be undertaken in class, either in groups or individually. The instructor will provide guidance and instruction on successfully completing lab activities. Lab activities include identifying different types of spectra, measuring and identifying various spectral line features with a spectrometer, plotting stars on a Hertzsprung-Russell diagram, and determining via telescope observations of the Moon, the older and younger surfaces, via crater counting.

DE Adaptations for MOI

Hypothesis driven experimental laboratory study of lab content through hands-on and virtual experiences will be undertaken within the CMS or using third-party sites linked in the CMS. Virtual lab activities can employ videos, text, simulations, models, databases and other available online resources. All resources used will meet accessibility requirements.

Method

Lecture

Integration

Lecture presentations on astronomical concepts, ranging from star birth to an ever expanding universe, will introduce key concepts and interpretive approaches to understanding what astronomy means in the modern world. Lectures will expand upon information provided in the assigned reading and visual materials, and provide the students with framework with which to analyze astronomy related controversies, pseudoscience, and cutting-edge science, as well as scientific institutions and practitioners. The scientific perspectives of underrepresented groups can be presented. Supporting visual materials may include slide presentations and other digitally-generated images such as charts, diagrams, photos, or film clips.

DE Adaptations for MOI

Lecture presentations can be presented as written lectures, slides, and audio-visual media, and will be presented in the CMS. All lecture material will be accessible. Accessible publisher content and other accessible internet resources may also be provided.

Method

Reading

Integration

Scientific readings from current periodicals on recent advances in astronomy, astrophysics, and related topics pertinent to the course can be required.

DE Adaptations for MOI

The reading material will be provided on the CMS and all work products (discussions, written work) will be submitted on the CMS. Accessibility guidelines will be met.

Methods of Evaluation

Method

Class Participation

Integration

Consistent observation of active student participation in astronomy lecture activities and laboratory activities. Students will apply their knowledge of the astronomical content and concepts of the course to achieve the course objective of exploring the impact of astronomy on society. Students will discuss the ethical and social considerations with other students and the instructor. Class participation will be assessed based on the quantity and quality of participation and the depth and breadth of contributions. Evaluation considerations include accuracy of contributions, evidence of preparation, organization, and evidence of engagement. Instructors will provide prompt assessment feedback, typically within two weeks, to help students learn how to contribute more in class.

DE Adaptations for MOE

Observation of student participation in online discussions and group activities will be performed by the instructor within the CMS. Students will apply their knowledge of the content and concepts of the course to achieve the course objective of exploring the impact of astronomy on the human condition. Students will discuss the ethical and social considerations with other students and the instructor. Class participation will be assessed based on the quantity and quality of participation and the depth and breadth of contributions. Instructors will share assessment feedback with students promptly, typically within two weeks, through the CMS to help students learn how to contribute more to online discussions and group activities.

Method

Class Work

Integration

Students will engage in weekly astronomical lab work and submit lab assignments to the instructor. Lab activities will allow students to achieve the course objective of designing, performing, and evaluating experimental investigations in astronomy through the application of the scientific method. Lab assignments will be submitted to the CMS or in person and evaluated for completeness, and the students will be assessed on their ability to accurately keep experimental records, analyze lab data, and evaluate their data to create thoughtful conclusions. Prompt lab work feedback will be provided by the instructor, typically within two weeks, to promote continued learning and help students prepare for lab practical exams.

DE Adaptations for MOE

Students engage in weekly lab work and submit lab assignments through the CMS. These lab activities will allow students to achieve the course objective of designing, performing, and evaluating experimental investigations in astronomy through the application of the scientific method. Lab assignments will be submitted to the CMS and evaluated for completeness and the students will be assessed on their ability to accurately keep experimental records, analyze lab data, and evaluate their data to create thoughtful conclusions. Prompt lab work feedback, typically within two weeks, will be provided by the instructor through the CMS to promote continued learning and help students prepare for lab practical exams. All labs will meet accessibility requirements and guidelines.

Method

Exams/Tests

Integration

Exams and quizzes will consist of multiple choice, fill-in-the-blank, short answer, and essay questions or similar types of questions and will require students to demonstrate competence with factual and thematic astronomical information covered in the textbook and lectures. Exams will encourage students to demonstrate comprehension of basic astronomical content as well as to think critically. Exams will assess student's ability to identify the most accurate answer, synthesize multiple concepts to derive new insights, describe processes accurately, justify proposed explanations, and predict future outcomes by applying the scientific method. Exam feedback will be provided by the instructor to correct misunderstanding and promote continued learning.

Exams/tests will be evaluated based on the demonstration of understanding and application of major astronomical topics as described in Course Content in alignment with Learning Objectives.

Examples include:
Midterm Exam:

A) Example of Essay Question on Midterm Exam:
Describe the four main theories on how the Moon formed. Include the pros and cons for each theory and which theory is favored and why.

B) Example of multiple-choice question on Midterm Exam:

Which of the below depictions best describes the orbit of the Earth about the Sun?
a. Picture of a nearly circular orbit with Sun at one foci.
b. Picture of an elliptical orbit with Sun at one foci.
c. Picture of a very elliptical orbit with Sun at one foci.

C) Example of a matching question on Midterm Exam.
Students are provided with a picture of a Hertzsprung-Russell diagram and are asked to match the number in the diagram with the correct grouping of stars.

DE Adaptations for MOE

Exams and/or tests for fully online courses will be administered and evaluated through the CMS. Hybrid course offerings may include exams/tests in a face-to-face setting as outlined in Methods of Instruction or through the CMS as outlined in DE Methods of Instruction. The format may include multiple choice, short answer, essay or similar. Exams/tests will be evaluated based on the demonstration of understanding and application of major topics as described in Course Content in alignment with Learning Objectives. Instructor feedback may be presented through grade book comments, inbox or other confidential means of communication through the course management system. Feedback will be provided in a timely fashion, typically within a two-week period. All exams/tests must meet accessibility guidelines.

Method

Exams/Tests

Integration

Laboratory practicals will evaluate student achievement of the course objective to apply the scientific method. The laboratory practicals will be evaluated for correctness of answers, completeness, demonstration of lab skills, and mastery of lab techniques. The questions will assess student's ability to identify the most accurate answer, scrutinize experimental design, use and identify laboratory equipment, evaluate data from laboratory experiments, and apply the scientific method. Lab Practical feedback will be provided promptly, typically within two weeks, by the instructor to correct misunderstanding and promote continued learning.

DE Adaptations for MOE

Laboratory practicals will evaluate student achievement of the course objective to apply the scientific method. Laboratory practicals will be time limited and given through the CMS. The laboratory practicals will be evaluated for completeness and the questions will assess student's ability to identify the most accurate answer, scrutinize experimental design, use and identify laboratory equipment, evaluate data from laboratory experiments, and apply the scientific method. Lab Practical feedback will be provided promptly, typically within two weeks, by the instructor through the CMS to correct misunderstanding and promote continued learning. All CMS functions will meet accessibility requirements.

Method

Quizzes

Integration

Periodic quizzes, consisting of multiple choice, fill-in-the-blank, short answer or similar questions types will be given to assess a specific course objective. Each quiz will be evaluated for completeness and accuracy. The questions will assess the student's ability to identify the best answer and eliminate flawed answers. Feedback from the instructor within two weeks will allow students to gauge their learning progress and prepare for the quizzes.

DE Adaptations for MOE

Periodic quizzes, consisting of multiple choice, fill-in-the-blank, short answer or similar questions types will be given to assess a specific course objective. Quizzes will be implemented using the CMS quiz function. Each quiz will be evaluated for completeness and accuracy. The questions will assess the student's ability to identify the best answer and eliminate flawed answers. Feedback from the instructor within two weeks will allow students to gauge their learning progress and prepare for the quizzes. All quizzes will meet accessibility requirements.

CCN Methods of Evaluation

Examples of potential methods of evaluation used to observe or measure students' achievement of course outcomes and objectives could include but are not limited to quizzes, exams, activities, projects, research demonstrations, laboratory activities, laboratory reports, practicums, etc.

Methods of evaluation are at the discretion of local faculty.

Assignments

Assignment Type
Reading

In-class and/or outside of class
Outside of class

Formative or Summative
Formative

Assignment
Students read the Scientific American article In the March 2016 issue of Scientific American, entitled “The Puzzle of Dark Energy” and answer the following questions:

1. What are three possible explanations for Dark Energy?
2. What is the fate of the Universe predicted by each Dark Energy possibility?
3. Create a table for the above answers.

This is a low stakes assignment.

How assignment will be adapted in online format
The assignment will be presented on the CMS as an assignment. All work will be submitted by students on the CMS. All parts of the assignment will meet accessibility requirements and guidelines.

Assignment Type
Writing

In-class and/or outside of class
Outside of class

Formative or Summative
Summative

Assignment
Students select a constellation visible during the night and then research the mythology, history, and types of celestial objects located within the constellation. Students then create a term paper describing their findings including what they actually saw when they tried to view the constellation. This is a high stakes assignment worth considerable point value.

How assignment will be adapted in online format
The assignment will be presented on the CMS as an assignment. All work will be submitted by students on the CMS. All parts of the assignment will meet accessibility requirements and guidelines.

Assignment Type
Writing

In-class and/or outside of class
Outside of class

Formative or Summative
Summative

Assignment
Pick one of the women astronomers in the book "The Sky is for Everyone: Women astronomers in their own words" edited by Virginia Trimble and David A. Weintraub and write a term paper that addresses the following questions:

1. What were some of the obstacles that the astronomer had to overcome during their family life and career?
2. What was the focus of their research?
3. How did they become interested in astronomy?
4. Does anything in their life mimic any of the issues you have faced during your academic career?

This is a high stakes assignment worth considerable point value.

How assignment will be adapted in online format

The assignment will be presented on the CMS as an assignment. All work will be submitted by students on the CMS. All parts of the assignment will meet accessibility requirements and guidelines.

Assignment Type

Other

In-class and/or outside of class

In-class

Formative or Summative

Formative

Assignment

Students are given the radial velocity light curves for two stars, each with an exoplanet orbiting the star. Students then follow the below procedure to analyze the light curves and come to a conclusion about which exoplanet has the greater potential for supporting life.

Procedure:
1. Using the RV graphs for stars A & B, determine the scale for each RV graph.
2. Using the RV data, measure the number of millimeters between two successive peaks and convert to days using the scale determined in step 1. This is the period P.
3. Take the period P in days for each exoplanet and convert to years by dividing by 365 days per year.
4. Use Kepler's 3rd law to determine a, the semi-major axis, in AU's. P2=a3, so a=(P2)1/3
5. Based on each planet's distance from it star, which planet stands the best chance of supporting life?

How assignment will be adapted in online format

The assignment will be presented on the CMS as an assignment. All work will be submitted by students on the CMS. All parts of the assignment will meet accessibility requirements and guidelines.

Assignment Type

Other

In-class and/or outside of class

In-class
Outside of class

Formative or Summative

Summative

Assignment

Midterm Exam:

A) Example of Essay Question on Exam:
Describe the four main theories on how the Moon formed. Include the pros and cons for each theory and which theory is favored and why.

B) Example of multiple-choice question:
Which of the below depictions best describes the orbit of the Earth about the Sun?
a. Picture of a nearly circular orbit with Sun at one foci.

b. Picture of an elliptical orbit with Sun at one foci.
c. Picture of a very elliptical orbit with Sun at one foci.

C) Example of a matching question.
Students are provided with a picture of a Hertzsprung-Russell diagram and are asked to match the number in the diagram with the correct grouping of stars.

How assignment will be adapted in online format

The assignment will be presented on the CMS as an assignment. All work will be submitted by students on the CMS. All parts of the assignment will meet accessibility requirements and guidelines.

Course Materials

Textbooks

• Fraknoi, A., Morrison, D., Wolf, S., et al. (2020 & Update 2024). Astronomy 2e. OER: OpenStax.
• Frank, A. (2020). Astronomy: At Play in the Cosmos. 2nd ed.: W. W. Norton and Company.
• Bennett, J., Donahue, M., Schneider, N., & Voit, M. (2022). The Essential Cosmic Perspective. 9th ed.: Pearson.
• Seeds, M., & Backman, D. (2025). Foundations of Astronomy. 15th ed.: Cengage.
• Palin, S., & Blumenthal, G. (2022). 21st Century Astronomy. 7th ed.: W. W. Norton and Company.

Other Resources

• Fraknoi, A. (2016 & Web 2021). A Compilation of Free Laboratory Activities for Astronomy 101 Courses. OER: OER Commons. Institute for the Study of Knowledge Management in Education. https://www.merlot.org/merlot/viewMaterial.htm?id=1374772
• Tuttle, S. (2016 & Web 2024). Distant Nature: Astronomy Exercises. OER: OER Commons. Institute for the Study of Knowledge Management in Education. https://oercommons.org/authoring/17181-distant-nature-astronomy-exercises
• Simulation Curriculum Corporation. (2024). Starry Night College Astronomy Lab Manual. 8th ed.: Simulation Curriculum Corp.
• Locally developed lab manual

Class Size Information

Class Size

32

Class Size Category

G - Large lab 32

Diversity and Inclusion

Course Design and Materials: Course will incorporate diverse perspectives, authors, and examples that reflect a variety of cultures, identities, and lived experiences. Instructional materials will be reviewed regularly to ensure representation, inclusivity, and alignment with equity-minded practices across disciplines.

Inclusive Learning Environment: Instructors will establish classroom norms and policies that promote respect, civil discourse, and belonging in both online and face-to-face classes. Clear expectations for communication and engagement will support a learning space where all students feel valued and heard.

Accessible Instruction: Course content will be delivered using accessible design. Materials will follow accessibility guidelines within the CMS, including captioned media, readable document formats, and multiple means of engagement to support diverse learning.

Equitable Teaching Practices: Instructors will use transparent and grading criteria, varied assessment methods, and timely feedback to promote fairness and student success. Opportunities for revision, reflection, and multiple demonstrations of learning may be incorporated when appropriate to the discipline.

Culturally Responsive Pedagogies: Instructional strategies will encourage critical thinking about diverse perspectives and systems of power relevant to the course content. Faculty will foster opportunities for students to connect course material to real-world contexts.

Ongoing Reflection and Improvement: Faculty will engage in continuous professional development related to IDEAA principles and reflect on course practices using metacognition to identify opportunities for increased equity, inclusion, and accessibility.

Explain how diversity and inclusion(e.g., gender, culture/race, sexuality, etc.) is infused into the course.

This course affords students the opportunity to learn about the diverse group of scientists from across the world that have contributed to the various branches of astronomy such as astrobiology, astrogeology and astroclimatology This includes the human impacts on the environment, the climate crisis (and its disproportionate impact on underprivileged peoples), and other topics that frequently engender dissension in society. Students are encouraged to not only learn the science, but to consider their own impacts and their ethical commitments.

Describe how assignments, instruction, evaluation, course content, and interactions are contextualized for diverse learners promoting an equitable course.

A concerted effort has been made to include elements of diversity in the course content and course assignments, where students are invited to study, research, communicate, and present on various vital topics. Specifically, the course content was enhanced to highlight the role and impact of women in astronomy as well as historically marginalized or underrepresented groups. The diverse participation of people in astronomy today is also highlighted.

The instructor will present course content and assess students in a variety of ways to accommodate for various learning preferences. With diverse learners in mind, a variety of accessible reading materials, films, and assignments are incorporated into this class. Assignments are written to challenge students to think critically about a variety of controversial topics related to astronomy. This allows students to develop as scholars and to pursue topics of particular relevance to them.

Interactions

Explain how the course will incorporate student-to-student interaction.

This course will incorporate student-to-student interaction through in-class or online discussions. Students will be able to engage in small group and whole class discussions with each other when completing collaborative learning exercises. They allow in-depth discussions on current astronomical topics such as the various types of exoplanets being discovered, the rolls of dark matter and dark energy on the evolution of the universe, and relating the climate crisis on the Earth to the climates of Venus and Mars. These discussions will be among students themselves, enabling students to exchange ideas and to prepare for course assignments and class activities. Students also work together on lab activities in small groups online or in-class, and respond to announcements and emails.

Explain how the course will incorporate instructor-to-student interaction.

Faculty will deliver lecture/discussions and facilitate group discussions or activities. In lecture, faculty will have the opportunity to model a scholarly approach to analyzing and interpreting scientific evidence, and show how evidence is used to support interpretations related to astronomy. The instructor(s) will encourage and emphasize critical thinking, the value of asking questions, research skills, and science (astronomy) literacy at all levels. Faculty will offer feedback on student assignments through accessible video conferencing software, CMS grading functionality, or individual meetings with students. Faculty will provide office hours and appointment meetings with students. Faculty will also be available by email or CMS message function.

Explain how the course will incorporate student-to-content interaction.

Students will interact with the content through reading (the textbook and a diverse array of sources provided in the course), watching accessible astronomy relevant multimedia or video content, listening to live or recorded lectures, participating in in in-class activities, by studying for and taking tests and the final, and through lab activities that illustrate key concepts in astronomy through hands-on interaction with astronomy related tools such as telescopes, spectrometers, and graphing techniques.

Explain how the course will incorporate student-to-self interaction (metacognitive).

This course will encourage students to reflect on how key events in the ongoing development of astronomy and astrophysics have had and continue to have a major impact on today's society and on their personal lives. Students will be encouraged during in-class and out-of-class activities to reflect on current concerns in society related to astronomy and astrophysics. Students will be given the opportunity to reflect on how critical thinking practiced and honed in this course can serve as transferable skills in other academic disciplines and further a student's career goals. The course also provides opportunities to confront critical issues in astronomy involving ethical commitments, environment concerns, racism, discrimination in the name of science, the climate crisis, and similar issues. The course encourages students to see these as current, crucial concerns and to consider their own personal responses.

Key: 293