

Revised by: D. Reynolds
Reviewed by: M. Mayfield
Reviewed by: J. May
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C & G Ed approval: October 24, 2025
Board approval: November 12, 2025
Semester effective: Fall 2026

Astronomy (ASTR) C1000 Introduction to Astronomy with Lab (4 Units) CSU: UC
[formerly ASTR 1511]

Prerequisites: None

Co-Requisites: None

Hours and Unit Calculations:

48 hours lecture. 96 Outside of Class Hours; 48 hours lab (192 Total Student Learning Hours)

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.

Type of Class/Course: Degree Credit

Representative Texts, Manuals, OER, and Other Support Materials

Texts used by individual institutions and even individual sections will vary.

Lecture:

- 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.

Lab:

- 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

Part 2:

Lecture:



Bennett, Jeffrey, et al. *The Cosmic Perspective*. 10th ed., Pearson, 2023.

Additional Required Materials:

Bennett, Jeffrey, et al. *Mastering Astronomy with eText - Access Code - for The Cosmic Perspective*. 10th ed. Pearson. 2023.

Lab:

Reynolds, David. *Astronomy C1000 Laboratory Manual*. Taft College Print Shop, 2025

Course Objectives:

At the conclusion of this course, the student should be able to (Identical and Required):

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.

Part 2:

At the conclusion of this course, the student should be able to:

Course Level Student Learning Outcomes:

1. Employ evidence-based reasoning when analyzing information in the completion of non-computational physical science problems.

Local General Education Learning Outcomes:

1. Develop an understanding of the relationship between science and other human behaviors.
2. Demonstrate the scientific method.

Course Scope and Content (Lecture):

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

Course Scope and Content (Laboratory):

Content will include:

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

Representative Assignments

Reading

Students research, review, and analyze multiple sources as part of a library research assignment regarding the subjects of the Milky Way and evolution of galaxies.

Writing

Students write multiple paragraphs for a library research assignment regarding the subjects of the Milky Way and evolution of galaxies.

Outside Activities:

The students in this class will spend a minimum of 6 hours per week in addition to watching the recorded lecture videos doing the following:

1. Studying text and learning objectives.
2. Answering questions.
3. Skill practice.
4. Completing required reading.
5. Problem solving activity or exercise.
6. Written work.

Methods of Instruction:

1. Assign reading topics in the textbook and selected references
2. Videos of class lectures will be used to clarify and extend the theoretical and factual concepts present in the text
3. Class discussions
4. Audiovisual materials, relative to some unit of study will be shown to supplement lecture materials
5. Problem sets and questions from the text will be assigned
6. Visual observations will be employed so that students may see some of the objects that are emphasized in the lectures

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.

Supplemental Data:

TOP Code:	191100: Astronomy
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SAM Priority Code:	E: Non-Occupational
Distance Education:	Online
Funding Agency:	Y: Not Applicable (funds not used)
Program Status:	I: Program Applicable
Noncredit Category:	Y: Not Applicable, Credit Course
Special Class Status:	N: Course is not a special class
Basic Skills Status:	N: Course is not a basic skills course
Prior to College Level:	Y: Not applicable
Cooperative Work Experience:	N: Is not part of a cooperative work experience education program
Eligible for Credit by Exam:	E: Credit By Exam
Eligible for Pass/No Pass:	C: Pass/No Pass
Taft College General Education:	CSB1: CSU Area B1 CSB3: CSU Area B3 IG5A: IGETC Area 5A IG5C: IGETC Area 5C LNS: Local GE Natural Science
Discipline:	Astronomy