Astronomy

Unless otherwise indicated, a grade of C or higher is required for all prerequisite courses.

**ASTR 100 INTRODUCTION TO ASTRONOMY**
General survey course in astronomy, in which students will study the sun, planets, their moons, and other minor bodies of the solar system. Students will also study extrasolar planets, stars, black holes, dark matter/dark energy and cosmology. Emphasis is on conceptual understanding of the universe. *Letter Grade Only. Degree Credit.*

**Units:** 3
**Hours/semester:** 48-54 Lecture; 96-108 Homework
**Recommended:** Eligibility for ENGL 838 or ENGL 848 or ESL 400. MATH 110
**AA/AS Degree Requirements:** Area E5a
**Transfer Credit:** CSU (CSU GE Area B1), UC (IGETC Area 5A)

**ASTR 101 ASTRONOMY LABORATORY**
Constellation identification, understanding of right ascension and declination, and basic astronomical measurements of our moon, planets, and stars. Occasional telescopic observations using CSM’s observatory. With ASTR 100, ASTR 115, or ASTR 125, satisfies lab requirements for UC and California State Universities. Extra supplies may be required. *Letter Grade Only. Degree Credit.*

**Units:** 1
**Hours/semester:** 48-54 Lab
**Prerequisites:** MATH 110 and completion of or concurrent enrollment in, ASTR 100 or ASTR 115 or ASTR 125
**AA/AS Degree Requirements:** Area E5a
**Transfer Credit:** CSU (CSU GE Area B3), UC (IGETC Area 5C)

**ASTR 103 OBSERVATIONAL ASTRONOMY LAB**
Offered as an alternative to Astronomy 101. Students observe the moon, planets, and various star clusters, using CSM observatory’s telescopes. They will have the opportunity to image planets and observe stellar spectra, using the department’s CCD cameras and Rainbow Optics eyepiece spectroscope. Use of the department’s planetarium projector assists students in becoming familiar with the sky. Focus is on observational techniques. Extra supplies may be required. *Letter Grade Only. Degree Credit.*

**Units:** 1
**Hours/semester:** 48-54 Lab
**Prerequisites:** MATH 110 and completion of or concurrent enrollment in ASTR 100, ASTR 115 or ASTR 125
**AA/AS Degree Requirements:** Area E5a
**Transfer Credit:** CSU (CSU GE Area B1), UC (IGETC Area 5A)

**ASTR 115 THE SOLAR SYSTEM**
Study of the sun, planets, their moons, asteroids, and comets, as well as the age and formation of the solar system. Also covers the history of astronomy and the contributions of various cultures to astronomy. Emphasizes the connection between Newton’s Laws and the conservation of energy to Kepler’s laws of planetary motion. Discusses the results of interplanetary space probes and the discovery of extrasolar planets. Focuses on conceptual understanding of the solar system. *Letter Grade Only. Degree Credit.*

**Units:** 3
**Hours/semester:** 48-54 Lecture; 96-108 Homework
**Recommended:** Eligibility for ENGL 838 or ENGL 848 or ESL 400. MATH 110
**AA/AS Degree Requirements:** Area E5a
**Transfer Credit:** CSU (CSU GE Area B3), UC (IGETC Area 5C)

**ASTR 125 STARS, GALAXIES, AND COSMOLOGY**
Study the sun, other stars, Milky Way galaxy, other galaxies and their evolution, black holes, quasars, dark matter, and the foundations of cosmology. Students will become familiar with the basic tenets of general relativity and its application to black holes. The concept regarding stars as the primary producers of energy in the universe as well as the chemicals necessary for life, is emphasized. Focus is on conceptual understanding of stars, galaxies, and the rudiments of cosmology. *Letter Grade Only. Degree Credit.*

**Units:** 3
**Hours/semester:** 48-54 Lecture; 96-108 Homework
**AA/AS Degree Requirements:** Area E5a
**Transfer Credit:** CSU (CSU GE Area B1), UC (IGETC Area 5A)

**ASTR 200 INTRODUCTION TO ASTROPHYSICS**
Designed for students who want to take a course more advanced than the introductory survey courses in astronomy. This course covers the fundamentals of photometry, spectroscopy, and stellar astrophysics. Topics include study of pulsating and cataclysmic variable stars, contact binaries, and galactic cannibalism. Emphasis is on a thorough understanding of basic astrophysics. *Letter Grade Only. Degree Credit.*

**Units:** 3

Courses marked with a (*) are transferable with unit limitations as specified in assist.org.
If you have questions, see your counselor.
ASTRONOMY

Hours/semester: 48-54 Lecture; 96-108 Homework
Prerequisites: Completion of or concurrent enrollment in PHYS 220 or PHYS 270. Completion of or concurrent enrollment in ASTR 125.

AA/AS Degree Requirements: Area E5a
Transfer Credit: CSU (CSU GE Area B1), UC (IGETC Area 5A)

ASTR 203 ASTROIMAGING TECHNIQUES
Hands on learning of various imaging techniques including astrophotography of galaxies and nebulae, spectroscopy, and photometry. Letter Grade Only. Degree Credit.

Units: 4
Hours/semester: 32-36 Lecture; 96-108 Lab; 64-72 Homework
Prerequisites: ASTR 103
Transfer Credit: CSU

ASTR 204 APPLICATION OF ASTROIMAGING TECHNIQUES
Application of techniques learned in ASTR 203 to gather data about celestial bodies. Topics investigated will include the use of spectroscopy to determine stellar composition and photometry to verify times of ingress and egress of transiting extrasolar planets. In addition, observatory control fundamentals will be emphasized and planned imaging runs will be an important component. Letter Grade Only. Degree Credit.

Units: 4
Hours/semester: 32-36 Lecture; 96-108 Lab; 64-72 Homework
Prerequisites: ASTR 203
Transfer Credit: CSU

Courses marked with a (*) are transferable with unit limitations as specified in assist.org.
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