ASTRONOMY

College of Natural Sciences and Mathematics

Program Description
Astronomy has played an important role in the development of modern science. Recent advances in technology and space exploration have made possible many remarkable new discoveries in astronomy. For both these reasons, the study of astronomy is an excellent way for the liberal arts student to gain an appreciation of scientific knowledge and methods, and is especially recommended for students who are preparing for a teaching career. The minor in astronomy, in combination with a major in a physical science, can help prepare students for graduate study in astronomy or astrophysics, or for a career in this field. More information about these possibilities is available from advisors in the Department of Physics and Astronomy.

Degree Program
Minor in Astronomy

Special Features
- Observation sessions are held in our facility on the roof of Amador Hall with a 14-inch Schmidt-Cassegrain instrument.
- Portable 10-inch Schmidt-Cassegrain telescopes, a solar telescope and a radio telescope are also available for use in courses and student projects.
- A modern computing facility is used for digital image analysis and data reduction, providing access to all major astronomical analysis software.
- 120 seat digital planetarium used as a classroom, and which provides public outreach opportunities for astronomy students and faculty.

Contact Information
Christopher Taylor, Department Chair
Heidi Yamazaki, Administrative Support Coordinator
Sequoia Hall 230
(916) 278-6518
Department of Physics and Astronomy Website (http://www.csus.edu/physics/)

Faculty
BARNIOL DURAN, RODOLFO
MARGONINER, VERA
PETTITT, ALEXANDER
TAYLOR, CHRISTOPHER

ASTR 4A. Introduction to the Solar System. 3 Units
Prerequisite(s): One year of high school geometry or instructor permission.
General Education Area/Graduation Requirement: Physical Science (B1)
Term Typically Offered: Spring only

ASTR 4B. Introduction to Stars, Galaxies, and Cosmology. 3 Units
Prerequisite(s): One year high school geometry or instructor permission.
General Education Area/Graduation Requirement: Physical Science (B1)
Term Typically Offered: Fall, Spring
Description and explanations of astronomical phenomena related to stars, galaxies, and cosmology. Structure and evolution of stellar and galactic systems. Occasional observation periods.

ASTR 4C. Introduction to Astrobiology. 3 Units
Prerequisite(s): One year high school geometry or instructor permission.
General Education Area/Graduation Requirement: Physical Science (B1)
Term Typically Offered: Fall only

ASTR 6. Astronomical Observation Laboratory. 1 Unit
Prerequisite(s): ASTR 4A, ASTR 4B, or ASTR 4C with C- or better; may be taken concurrently.
General Education Area/Graduation Requirement: Laboratory (B3), Physical Science (B1)
Term Typically Offered: Fall, Spring, Summer
Study and use of various telescopes; field observation of planets, stars, meteors, asteroids, the moon and sun; laboratory activities relevant to astronomy. Lab three hours.

ASTR 131. The Solar System and Space Exploration. 3 Units
Prerequisite(s): Junior standing; a WPJ Portfolio score OR ENGL 109M or ENGL 109W
General Education Area/Graduation Requirement: Writing Intensive Graduation Requirement (WI), Upper Division Further Studies in Area B5, Further Studies in Area B (B5)
Term Typically Offered: Fall only
Planets and satellites, including their composition, structure, and atmospheres, with emphasis on modern techniques and observations. Solar surface phenomena and their influence on planets through the solar wind. Comets, meteorites, and their implications for the origin and evolution of planets. Physical effects governing feasible forms of space exploration and colonization.
Note: This course is approved as a Writing Intensive course.
ASTR 132. Stars, Galaxies and Cosmology. 3 Units
Prerequisite(s): ASTR 4A or ASTR 4B or 4C or PHYS 11A or CHEM 1A and GWAR certification before Fall 09; or WPJ score of 80+; or 3-unit placement in ENGL 109M or ENGL 109W; or 4-unit placement in ENGL 109M or ENGL 109W and co-enrollment in ENGL 109X; or WPJ score 70 or 71 and co-enrollment in ENGL 109X.
General Education Area/Graduation Requirement: Upper Division Further Studies in Area B5, Further Studies in Area B (B5), Writing Intensive Graduation Requirement (WI)
Term Typically Offered: Spring only

Types and evolution of stars; structure and evolution of galaxies; overall structure of the universe; current developments in astronomy.
Note: This course is approved as a Writing Intensive course.

ASTR 150. Dark Matter and Dark Energy. 3 Units
Prerequisite(s): PHYS 106
Corequisite(s): PHYS 110
Term Typically Offered: Spring only – odd years

Introduction to historical, observational and theoretical principles of dark matter and dark energy in the Universe. Topics will include dark matter in galaxies (rotation curves, stellar motions), dark matter in clusters (virial theorem, x-ray observations), MACHOs and WIMPs as dark matter candidates, as well as the discovery of dark energy through supernovae observations, and additional probes of dark energy. Dark matter and dark energy will be discussed in the cosmological context of the Big Bang theory.

ASTR 180. Through Space and Time in the Planetarium. 3 Units
Prerequisite(s): Completion of GE Area B1 and B4.
General Education Area/Graduation Requirement: Upper Division Further Studies in Area B5, Further Studies in Area B (B5)
Term Typically Offered: Fall, Spring

An exploration of the heavens through space and time using the planetarium as an investigative tool. This course covers the historical, observational and theoretical principles of astronomy. Topics include the nature of science, structure of the universe, the sky view, orbital motions, precession, constellations, lunar phases and eclipses. The course will also explore the observational evidence for modern and ancient world views.

ASTR 199. Special Problems. 1 - 2 Units
Term Typically Offered: Fall, Spring

Individual projects or directed reading.
Note: Open only to students competent to assume individual work on approval of the instructor. Up to 2 units may be taken for a grade.

Credit/No Credit