

# ASTRONOMY (ASTR)

## 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

Description and explanations of astronomical phenomena and measurements related to the Solar System and exoplanets. Structure and evolution of planetary systems. Formation of solar systems and planets. Occasional observation periods.

## 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

Nature and history of scientific inquiry into life outside the Earth. Definitions of life. Habitability of planets and moons in our Solar System and of extrasolar planets. Likelihood of intelligent life outside Earth and rationale for the Search for Extra-Terrestrial Intelligence.

## 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):** ASTR 4A or ASTR 4B or 4C or PHYS 11A or CHEM 1A and GEAR 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:** Further Studies in Area B (B5), Writing Intensive Graduation Requirement (WI)

**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 GEAR 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:** 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 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