

# ASTRONOMY (ASTR)

## ASTR 103 Descriptive Astronomy

**Description:** Approach is essentially nonmathematical. Survey of the nature and motions of the planets, the sun, the stars, and their lives, galaxies, and the structure of the universe. Black holes, pulsars, quasars, and other objects of special interest included.

**Credit Hours:** 3

**Max credits per semester:** 3

**Max credits per degree:** 3

**Grading Option:** Graded with Option

**Prerequisite for:** ASTR 113; ASTR 203

**ACE:** ACE 4 Science

**Course and Laboratory Fee:** \$25

## ASTR 103H Honors: Descriptive Astronomy

**Prerequisites:** Good standing in the University Honors Program or by invitation. Credit toward the degree cannot be earned in both ASTR 103 and ASTR 103H.

**Notes:** Broad look at astronomy for non-science majors.

**Description:** Approach is essentially non-mathematical, but simple algebra is employed where appropriate. Sun and solar system, the stars, galaxies, and cosmology. Black holes, pulsars, quasars, and other objects of special interest included. Emphasis on both "what is out there" and "how we know it".

**Credit Hours:** 3

**Max credits per semester:** 3

**Max credits per degree:** 3

**Grading Option:** Graded

**Prerequisite for:** ASTR 113; ASTR 203

**ACE:** ACE 4 Science

**Course and Laboratory Fee:** \$25

## ASTR 113 Selected Topics in Astronomy

**Prerequisites:** ASTR 103 or permission.

**Description:** A non-mathematical continuation and extension of ASTR 103, designed for students who would like a more detailed look at specific areas in astronomy. Possible topics: astronomy and relativity; life in the universe; pulsars, quasars, and black holes; evolution of galaxies, origin of the universe.

**Credit Hours:** 3

**Max credits per semester:** 3

**Max credits per degree:** 3

**Grading Option:** Graded with Option

**ACE:** ACE 4 Science

## ASTR 117 Life in the Universe

**Description:** Survey of what modern science tells us about the possibilities of life elsewhere in the universe. Topics include how the Earth formed and became suitable for life, how life arose on the Earth, the conditions under which life can thrive, places in the solar system that might support life, the existence of other solar systems that might provide suitable habitats, and attempts to find evidence of life on other planets.

**Credit Hours:** 3

**Max credits per semester:** 3

**Max credits per degree:** 3

**Grading Option:** Graded with Option

**ACE:** ACE 4 Science

## ASTR 203 Introduction to Observational Astronomy

**Prerequisites:** ASTR 103/ASTR 103H or equivalent

**Notes:** The course consists of 2 lecture hours and three evening laboratory hours per week.

**Description:** Exploration of equipment and techniques needed to observe and investigate the motions and objects in the night sky.

**Credit Hours:** 4

**Max credits per semester:** 4

**Max credits per degree:** 4

**Grading Option:** Graded with Option

**Course and Laboratory Fee:** \$25

## ASTR 204 Introduction to Astronomy and Astrophysics

**Prerequisites:** PHYS 211/211H or PHYS 141/141H; MATH 107/107H; parallel ASTR 224

**Notes:** Survey of the sun, the solar system, stellar properties, stellar systems, interstellar matter, galaxies, and cosmology.

**Description:** Survey of the sun, the solar system, stellar properties, stellar systems, interstellar matter, galaxies, and cosmology.

**Credit Hours:** 3

**Max credits per semester:** 3

**Max credits per degree:** 3

**Grading Option:** Graded with Option

**Prerequisite for:** ASTR 224

**ACE:** ACE 4 Science

## ASTR 224 Astronomy and Astrophysics Laboratory

**Prerequisites:** Parallel ASTR 204.

**Description:** Telescopic observations and laboratory experiments relating to observational astronomy. Obtaining digital astronomical images, the analysis of the resulting data and its astrophysical interpretation.

**Credit Hours:** 1

**Max credits per semester:** 1

**Max credits per degree:** 1

**Grading Option:** Graded with Option

**Course and Laboratory Fee:** \$55

## ASTR 403 Galactic and Extragalactic Astronomy

**Crosslisted with:** ASTR 803

**Prerequisites:** ASTR 204 and PHYS 213, and permission.

**Description:** Introduction to the techniques for determining constituents and dynamics of our galaxy, including interstellar matter and theories of spiral arm formation. Extragalactic topics include basic characteristics of galaxies, active galaxies, quasars, evolution, and the cosmological distance scale.

**Credit Hours:** 3

**Max credits per semester:** 3

**Max credits per degree:** 3

**Grading Option:** Graded with Option

## ASTR 404 Stellar Astrophysics

**Crosslisted with:** ASTR 804

**Prerequisites:** ASTR 204; PHYS 213; and permission.

**Description:** Stellar atmospheres, interiors, and evolution. Theoretical and observational aspects of stellar astronomy. The relation between observed parameters and theoretical parameters, star formation, stellar energy generation, and degenerate stars.

**Credit Hours:** 3

**Max credits per semester:** 3

**Max credits per degree:** 3

**Grading Option:** Graded with Option

**ASTR 405 Physics of the Solar System**

**Crosslisted with:** ASTR 805

**Prerequisites:** ASTR 204; MATH 107/107H; PHYS 142/142H or PHYS 212/212H.

**Description:** Celestial mechanics; tidal effects; planetary interiors; atmospheres and surfaces; comets; asteroids; and the origin of the solar system. Applying physics to the solution of solar system problems.

**Credit Hours:** 3

**Max credits per semester:** 3

**Max credits per degree:** 3

**Grading Option:** Graded with Option

**ASTR 407 Physics of the Interstellar Medium**

**Crosslisted with:** ASTR 807

**Prerequisites:** ASTR 204 and PHYS 213.

**Description:** Gaseous nebulae, interstellar dust, interstellar clouds and star forming regions. Theoretical and observational aspects of the various components of the interstellar medium. Includes the physics of emission nebulae, the properties of the interstellar dust, interstellar molecules and the properties of clouds in which star formation occurs.

**Credit Hours:** 3

**Max credits per semester:** 3

**Max credits per degree:** 3

**Grading Option:** Graded with Option

**ASTR 492 Special Topics in Astronomy**

**Crosslisted with:** ASTR 892

**Prerequisites:** ASTR 204 and permission.

**Description:** Topic varies.

**Credit Hours:** 1-6

**Min credits per semester:** 1

**Max credits per semester:** 6

**Max credits per degree:** 6

**Grading Option:** Graded with Option