Astronomy (ASTR)

ASTR 100 Descriptive Astronomy (3)

Lecture, 3 hours. A survey designed primarily for non-science majors, including an introduction to historic astronomy, Newton's Laws, gravitation, atomic structure, light, and telescopes. Take a tour of the solar system, learn about space flight, stars and stellar evolution, galaxies, and the structure of the universe. Satisfies GE, Area B1 or B3 (Physical Sciences).

ASTR 231 Introduction to Observational Astronomy (2)

Lecture, 1 hour; laboratory, 3 hours. Principles of astronomical measurement techniques with field and laboratory studies of astronomical objects. Identification of constellations; astronomical coordinates; use of the telescope; and techniques in imaging, photometry, and spectroscopy. Satisfies GE, Area B1 or B3 (Physical Sciences) and GE laboratory requirements. Prerequisite: previous or concurrent enrollment in ASTR 100.

ASTR 303 Life in the Universe (3)

Lecture, 3 hours. The course is an appraisal of the possibilities and prospects for life in the universe and travel beyond our Solar System. Topics to be covered include: the nature of life, habitability of Earth and other worlds within our Solar System, detection of planets beyond our Solar System, the search for life beyond Earth, and space travel. This course emphasizes the scientific method, especially the development of scientific theories founded in observational and experimental evidence. Satisfies GE, category B3 (Specific Emphasis in Natural Sciences). Prerequisite: ASTR 100.

ASTR 305 Frontiers in Astronomy (3)

Lecture, 3 hours. A survey of recent developments in astronomy and how these breakthroughs are made: the discovery of planets orbiting other stars; the explosive deaths of stars and the creation of neutron stars and black holes; and the study of the origin and fate of the Universe, including the search to understand dark matter and dark energy. Satisfies GE, Area B3 (Specific Emphasis in Natural Sciences). Prerequisite: one course in astronomy.

ASTR 331 Astronomical Imaging (2)

Lecture, 1 hour; laboratory, 3 hours. An introduction to the methods and techniques of astronomical imaging. The course will offer a practical approach to using charged-coupled device (CCD) detectors and computer-controlled telescopes to obtain images of the moon, planets, stars, and nebulae. Topics include telescope control, planning observing programs, identifying astronomical objects, determining image sizes and exposure times, and image processing techniques. Prerequisite: ASTR 231 or consent of instructor.

ASTR 350 Cosmology (3)

Lecture, 3 hours. A survey of what we know about the Universe and how scientists have learned it. Topics include the Big Bang, cosmic inflation, surveys of galaxies, the origin and evolution of structure in the Universe, dark matter, and dark energy. Satisfies GE Area B3 (Specific Emphasis in Natural Sciences). Prerequisite: ASTR 100.

ASTR 380 Astrophysics: Stars (3)

Lecture, 3 hours. A quantitative study of the structure and evolution of stars, including stellar interiors and atmospheres, nucleosynthesis and late stages of stellar evolution. Prerequisites: PHYS 314 and MATH 211.

ASTR 396 Selected Topics in Astronomy (1-3)

Lecture, 1-3 hours. A course of lectures on a single topic or set of related topics not ordinarily covered in the Astronomy curriculum. The course may be repeated for credit with a different topic. Prerequisite: consent of instructor.

ASTR 482 Advanced Observational Astronomy (2)

Lecture, 1 hour; laboratory, 3 hours. A study of advanced observing techniques including imaging and spectroscopy. Emphasis on the use of telescopes, instrumentation, and data processing including photometry and astrometry. Discussion of techniques across the electromagnetic spectrum. Statistical treatment of data and error analysis. Prerequisites: ASTR 231, or PHYS 214 or PHYS 210B, or consent of instructor.

ASTR 492 Instructional Design Project (2)

A directed project to develop at least one laboratory experiment and/or classroom activity that teaches basic concepts in undergraduate Astronomy. Both written and oral presentations (including a demonstration of the experiment or activity) will be required. Prerequisites: PHYS 214 and 216 or PHYS 210B and 209B; ASTR 231. Course may be repeated for credit.

ASTR 495 Special Studies (1-4)

The Department of Physics and Astronomy encourages independent study and considers it to be an educational undertaking. Students wishing to enroll for special studies are required to submit to their supervising faculty members proposals which outline their projects and exhibit specific plans for their successful completion. May be repeated for credit.

ASTR 497 Undergraduate Research in Astronomy (2)

Supervised research in an area of astronomy that is currently under investigation by one or more members of the Physics and Astronomy Department's faculty. This course may be repeated for up to 6 units of credit. Prerequisites: junior-standing and consent of instructor.