

ASTR Astronomy

ASTR 1000 Introduction to the Universe

3 Credit Hours. 3 Lecture Hours. 0 Lab Hours.

A survey of the universe, examining the historical origins of astronomy; the motions and physical properties of the Sun, Moon, and planets; the formation, evolution, and death of stars; and the structure of galaxies and the expansion of the universe.

ASTR 1010 Astronomy of the Solar System

3 Credit Hours. 3 Lecture Hours. 0 Lab Hours.

Astronomy from early ideas of the cosmos to modern observational techniques. The solar system planets, satellites, and minor bodies. The origin and evolution of the solar system.

Prerequisite(s): Prior or concurrent enrollment in ASTR 1211.

ASTR 1020 Stellar and Galactic Astronomy

3 Credit Hours. 3 Lecture Hours. 0 Lab Hours.

The study of the Sun and stars, their physical properties and evolution, interstellar matter, star clusters, our galaxy and other galaxies, and the origin and evolution of the Universe.

Prerequisite(s): Prior or concurrent enrollment in ASTR 1211.

ASTR 1211 Astronomy Lab

1 Credit Hour. 0 Lecture Hours. 2 Lab Hours.

A series of laboratories designed to measure the physical properties of planets, stars, and galaxies.

Prerequisite(s): Prior or concurrent enrollment in ASTR 1010 or ASTR 1020.

ASTR 3000 Intro to the Universe

3 Credit Hours. 3 Lecture Hours. 0 Lab Hours.

A survey of the Universe. Examines the historical origins of astronomy; the motions and physical properties of the sun, moon, and planets; the formation, evolution, and death of stars; the structure of galaxies; the expansion of the Universe. (Students may not receive credit for ASTR 3000 if they receive credit for ASTR 1010 and ASTR 1020.)

Prerequisite(s): Completion of MATH 0099 or MATH 1001 or MATH 1111.

ASTR 3131 Optics

3 Credit Hours. 3 Lecture Hours. 0 Lab Hours.

Geometric, physical, and quantum optics in which the general principles of wave optics and several optical devices are studied.

Prerequisite(s): A minimum grade of "C" in PHYS 2212K.

Cross Listing(s): PHYS 3131.

ASTR 3137 The Search for Life in the Universe

3 Credit Hours. 3 Lecture Hours. 0 Lab Hours.

The course will describe the current quest to find intelligent life in the universe. It will begin with a discussion of the nature and origin of life on Earth. After considering the search for life in our solar system, techniques used to search for extrasolar planets and extraterrestrial life will be explored. The course will also include a discussion of the physical limitations to interstellar spaceflight and alternative methods of communication.

Prerequisite(s): ASTR 1000 or ASTR 1010 or ASTR 1020.

ASTR 3538 Physical Astronomy

3 Credit Hours. 3 Lecture Hours. 0 Lab Hours.

The physical nature of the solar system, stars and galaxies will be studied in detail. Principles of physics will be used and illustrated, especially in the areas of mechanics, thermodynamics, physical optics, and spectral analysis.

Prerequisite(s): PHYS 2211K or PHYS 1111K, and PHYS 2212K or PHYS 1112K.

ASTR 3558 Introduction to General Relativity

3 Credit Hours. 3 Lecture Hours. 0 Lab Hours.

An introduction to the metric description of different spacetimes that describe flat and various curved geometries so as to derive the laws of mechanics for planets, stars, black holes, etc. The course also introduces a very simple model of the expanding universe and briefly introduces cosmology.

Prerequisite(s): PHYS 3537 or permission of instructor.

Cross Listing(s): PHYS 3558.

ASTR 3790 Teaching Internship in Astronomy

1-2 Credit Hours. 0 Lecture Hours. 0 Lab Hours.

The internship allows students to investigate teaching practices in astronomy. The student will participate in an introductory workshop immediately prior to the start of the semester, intern in the planetarium, and meet with the faculty mentor one hour each week.

Prerequisite(s): Permission of instructor required and ASTR 1000 or ASTR 1010 or ASTR 1020.

ASTR 4130 Astrophysics

3 Credit Hours. 3 Lecture Hours. 0 Lab Hours.

This course will cover advanced topics in Astrophysics. Students will become familiar with the fundamental physics of stars. This includes stellar atmospheres, interiors, and evolution. Students will study the atomic properties of matter and its interaction with light. Students will also study techniques for observing stars using telescopes and interferometers.

Prerequisite(s): A minimum grade of "C" in PHYS 2212K.

ASTR 4138 Galactic Astronomy

3 Credit Hours. 3 Lecture Hours. 0 Lab Hours.

Galactic Astronomy will cover advanced topics in galactic structure and evolution. This includes galaxy morphology, stellar and gaseous content, stellar orbits, disk dynamics, central massive black holes, large scale structure, interactions and evolution in a cosmological setting. Students will also be introduced to the historic development of our modern view of the universe.

Prerequisite(s): A minimum grade of "C" in PHYS 2212K.

ASTR 4330 Observational Techniques in Astronomy

3 Credit Hours. 3 Lecture Hours. 0 Lab Hours.

This course will cover advanced topics in astronomical observing techniques. This includes the basic physical principles and methods needed to plan, obtain, and reduce photometric data of celestial objects. Students will be introduced to the principles of spherical astronomy, photoelectric detectors, atmospheric extinction and standard system transformations, and the Image Reduction and Analysis (IRAF) software package.

Prerequisite(s): A minimum grade of "C" in PHYS 2212K.

ASTR 5090 Selected Topics in Astronomy

2-5 Credit Hours. 0-5 Lecture Hours. 0-6 Lab Hours.

A course allowing for investigation of selected topics in Astronomy; it will be taught on a one-time basis. Lecture only courses can be for two, three, or five credit hours. For laboratory courses, one credit hour will be given for every three hours spent working in lab.

Prerequisite(s): A minimum grade of "C" in PHYS 2212K. Cross Listing(s): ASTR 5090G.

ASTR 5090G Selected Topics in Physics

2-5 Credit Hours. 0-5 Lecture Hours. 0-6 Lab Hours.

A course allowing for investigation of selected topics in Astronomy; it will be taught on a one-time basis. Lecture only courses can be for two, three, or five credit hours. For laboratory courses, one credit hour will be given for every three hours spent working in lab. Graduate students will be given an extra assignment determined by the instructor that undergraduates will not be required to do.

Prerequisite(s): A minimum grade of "C" in PHYS 2212K.

Cross Listing(s): ASTR 5090.

ASTR 5890 Astronomy Research Experience

1-4 Credit Hours. 0-3 Lecture Hours. 0 Lab Hours.

An independent physics research experience in which a student will investigate a research question under the direction of a faculty member. Students will be expected to maintain a laboratory notebook, prepare a written summary of the research, and give an oral presentation at the end of the experience.

Prerequisite(s): Permission of instructor is required. Cross Listing(s): ASTR 5890G, PHYS 5890, PHYS 5890G.

ASTR 5890G Astronomy Research Experience

1-4 Credit Hours. 0-3 Lecture Hours. 0 Lab Hours.

An independent physics research experience in which a student will investigate a research question under the direction of a faculty member. Students will be expected to maintain a laboratory notebook, prepare a written summary of the research, and give an oral presentation at the end of the experience. Graduate students will be given an extra assignment determined by the instructor that undergraduates will not be required to do. Permission of instructor is required.

Cross Listing(s): ASTR 5890, PHYS 5890, PHYS 5890G.

ASTR 6100 Stellar Astronomy

3 Credit Hours. 3 Lecture Hours. 0 Lab Hours.

A review of stellar astronomy. Stars, evolution of stars, galaxies, active galaxies and quasars, structure of the universe, and cosmology. This course is a survey of stellar astronomy but is designed primarily for students enrolled in graduate education programs, and credit may not be earned in both ASTR 3100 and ASTR 6100.