Astronomy-Physics (ASP)

Courses

ASP 101. Solar Systems and Planets. 3 Hours.
A classic introductory astronomy course that is a descriptive introduction to modern concepts of the physical nature of the astronomical universe for non-science majors. Topics include methods of scientific inquiry, astronomical instrumentation, our solar system, the planets, and extra-solar planets and other solar systems. Course Information: This course fulfills a general education requirement at UIS in the area of Physical Science without a Lab (IAI Code: P1 906).

ASP 102. Stars and Galaxies. 3 Hours.
A classic introductory astronomy course and descriptive introduction to modern concepts of the physical universe for non-science majors. Topics include methods of scientific inquiry, telescopes, relativity and modern physics, the Sun, stars, galaxies, and the greater universe. Course Information: ASP 101 is NOT a prerequisite for this course. This course fulfills a general education requirement at UIS in the area of Physical Science without a Lab (IAI Code: P1 906).

ASP 103. Practical Astronomy Lab. 1 Hour.
An introduction to the night sky and modern methods used by astronomers to conduct experiments in astronomy including: navigating the night sky, photometry (visual, PEP and CCD), spectroscopy, and analysis of periodic phenomenon. One of the main goals of this class is to give students taking it the skills to become productive contributors to crowd-sourced citizen science efforts. Course Information: This course fulfills a general education requirement at UIS in the area of Physical Science with Lab. 420228.

ASP 104. Introduction to Physical Science. 3 Hours.
An introduction to physics, geology, and astronomy and the relationship of each to the other. Emphasis on critical thinking skills and problem-solving techniques using both computer-based and laboratory activities. Course Information: This course fulfills a general education requirement at UIS in the area of Physical Science without a Lab.

ASP 201. University Physics I. 4 Hours.
Lectures and laboratories in kinematics; Newton's three laws; work and energy; conservation of linear momentum; angular momentum; rotational dynamics; gravitation and Kepler's laws; harmonic motion, waves, and sound. Course Information: Prerequisite: MAT 115 or equivalent course or placement. This course fulfills a general education requirement at UIS in the area of Physical Science with a Lab (IAI Code: P2 900L).

ASP 202. University Physics II. 4 Hours.
Lectures and laboratories in laws of thermodynamics; ideal gases and thermal properties; kinetic theory of gases; fluid mechanics; electricity and magnetism; RCC circuits; laws of Gauss, Ampere, and Faraday; magnetic properties, Maxwell's equations, and optics. Course Information: Prerequisite: ASP 201.

ASP 221. Introduction to Cosmology. 3 Hours.
The scientific study of the origins and evolution of our universe: how the universe began, how it has evolved, and what its future may be. Topics: physics according to Galileo, Newton, & Einstein, relativity, black holes, the expanding universe, scientific models for our universe, the Big Bang, the origins of matter, energy, dark matter and dark energy, and how human society and culture has affected and been affected by our understanding of our place in our universe. Course Information: This course fulfills a general education requirement at UIS in the area of Physical Science without a lab.

ASP 303. Modern Astronomy. 4 Hours.
Quantitative approach to the solar system, astrophysics, and stellar systems.

ASP 404. Astrophysics. 4 Hours.
Origin, evolution, interiors, and energy production mechanisms of stars.

ASP 406. Modern Cosmology. 4 Hours.
Analytical approach to the grand unified theories (GUTS) of particle physics that have recently been developed in conjunction with the standard big bang model to explain the origin, evolution, and present structure of the universe.

ASP 407. Practical Astronomy. 3 Hours.
An introduction to basic astronomical fieldwork and data gathering techniques. Topics will include basics of telescope design and observatory operation, techniques of imaging and photometry using both a telescope and online databases, and processing of that data.

ASP 408. Observational Astronomy. 4 Hours.
Techniques of spectroscopy in determining stellar temperatures, luminosities, and chemical compositions, using the campus' 14 and 20 inch telescopes and spectrograph. Course Information: Prerequisite: ASP 407.

ASP 409. Galaxies: Structure and Evolution. 4 Hours.
Comprehensive study of galaxies, including development of galactic structure, star formation and distribution, interstellar medium, galactic dynamics, dark matter, and interacting galaxies.

ASP 410. Research. 1-4 Hours.
Investigation of a specific problem in astronomy-physics of interest to the student and instructor. Course Information: May be repeated with approval.

ASP 420. Topics In Astronomy/Physics. 4 Hours.
In-depth study of topics such as the solar system and theories of the universe. Course Information: May be repeated if topics vary.