

899. Master's Thesis Research
Fall, Winter, Spring. Variable credit.
May reenroll for a maximum of 12 credits. Approval of department.

ARTS AND LETTERS A L

College of Arts and Letters

390H. Perspectives in Literature
Fall. 4(3-0) Juniors, approval of Honors College.

Attention will be focused on several major literary works. Students will employ various types of literary analysis, considering theme, idea, structure, etc., and examining some major trends in contemporary literary criticism.

391H. Perspectives in Philosophy
Winter. 4(3-0) Juniors, approval of Honors College.

The two primary areas of concern will be ethics and aesthetics, the emphasis on one or the other to be determined by the professor. The course will include reading of major works, discussion of major figures in the fields, and the preparation of a substantial paper.

392H. Perspectives in History
Spring. 4(3-0) Juniors, approval of Honors College.

The focus will be on the nature of international diplomacy in the 20th century, the development of nationalism, the balance of power system, the influence of new ideologies, and the developments of the power structure since 1945.

393H. Perspectives in 20th Century Arts: 1900-1920
Fall. 3(3-0) Juniors, approval of Honors College.

Reaction to Naturalism across the arts traced in Symbolism and Expressionism as interrelated phenomena in response to the crisis of confidence in European institutions.

394H. Perspectives in 20th Century Arts: 1920-1945
Winter. 3(3-0) Juniors, approval of Honors College.

Formalist analysis of art elements examined across the arts in Cubism, Surrealism and new musical structures as positive response to war, depression and dictatorship.

395H. Perspectives in Contemporary Arts: Postwar Period
Spring. 3(3-0) Juniors, approval of Honors College.

The function of avant-garde arts after World War II to the present studied in the new dimensions of an environment created by new technology and the mass media explosion.

450. Arts Management
Fall, Winter, Spring. 3 to 5 credits.
May reenroll for a maximum of 9 credits. Seniors or Graduate Students or approval of department.

Administration of arts organizations, management of facilities, understanding operational methods and procedures of performing companies, financial structure and funding of arts centers, study of audience development, contemporary trends in arts management field.

491H. Perspectives in the Social Sciences and Humanities
Fall, Winter, Spring. 2 to 6 credits.
May reenroll for a maximum of 12 credits if different topic is taken. Juniors, approval of Honors College, or approval of instructor. Interdepartmental with the College of Social Science and Justin Morrill College.

An integration of subject matter and methodologies of several disciplines as they are relevant to particular topic areas.

999. Doctoral Dissertation Research
Fall, Winter, Spring, Summer. Variable credit. May reenroll for a maximum of 36 credits. Approval of college.

ASTRONOMY AND ASTROPHYSICS AST

College of Natural Science

109. Astronomical Fiction
Winter. 1(1-0) AST 119 concurrently.
Concurrent readings of works of science fiction to assist the visualization of the concepts presented in AST 119.

115. Exploring Cosmology
Spring. 2(2-0) Not open to engineering or physical science majors.
Nonmathematical view of the origin, history, and overall structure of the universe, based on the Big Bang model of cosmology.

117. Introductory Observing
Fall, Spring. 2(1-2) AST 119, or AST 217, or AST 229 or concurrently and approval of department.
Observations of celestial objects, constellation identification, and occasional planetarium exercises.

119. General Astronomy (N)
Fall, Winter, Spring, Summer. 4(4-0)
Not open to engineering or physical science majors. Students may not receive credit in more than one of the following: AST 119, AST 217, AST 229.
A qualitative presentation of man's current view of the universe including birth and death of stars, cosmology, comparisons of planets, and life in the universe.

120. Topics in Astronomy
Winter, Spring. 4(4-0) AST 119.
Detailed qualitative discussion of currently interesting topics in astronomy. May include such topics as quasars, pulsars, black holes, planetary exploration, cosmology, concepts of relativity.

217. General Astronomy (N)
Fall, Winter. 4(4-0) MTH 102 or MTH 109 or MTH 111. Students may not receive credit in more than one of the following: AST 119, AST 217, AST 229.
Intended primarily for physical science majors. A semiquantitative presentation of man's current view of the universe including birth and death of stars, cosmology, comparisons of planets, and life in the universe.

229. General Astronomy
Fall. 4(4-0) PHY 287 or PHY 291H or concurrently; MTH 113. Students may not receive credit in more than one of the following: AST 119, AST 217, AST 229.

Fundamental observations in astronomy and their interpretation through physical laws. Intended for physical science majors and recommended for astrophysics majors. Quantitative discussion of orbital motion, time, telescopes, solar system, stars, galaxies, and cosmology. Limited opportunity for astronomical observations.

327. Practical Astronomy
Winter. 3(3-0) AST 217 or AST 229, MTH 113.

Celestial coordinate systems. Time conversion and sidereal time. Atmospheric refraction, parallax, proper motion, aberration, and precession. Star catalogs and ephemerides. Finding charts and setting of equatorial telescopes.

378. Contemporary Astronomy
Winter. 3(3-0) AST 217 or AST 229.

A continuation of General Astronomy with particular emphasis on modern developments. May include such topics as planetary exploration, interstellar matter, star formation, stellar evolution through final stages, supernovae, pulsars, neutron stars, black holes, galaxies, and cosmology.

437. Observatory Practice
Spring. 3(1-4) AST 327 and approval of department.

Stellar photography. Photographic photometry. Photoelectric photometry and corrections for atmospheric extinction. Multicolor photometric systems. Astronomical spectroscopy and radial velocity determinations.

458. Astrophysics
Winter. 3(3-0) AST 217 or AST 229, PHY 289, PHY 395, or approval of department.
Application of physical principles to the atmospheres and interiors of stars to deduce their physical properties. Discussion of radiation, spectra and gas properties.

459. Solar System Physics
Spring. 3(3-0) PHY 289 or approval of department.
Physical properties of the sun, interplanetary space, planets, and satellites as deduced from terrestrial observations and from space probes. Recent results of the NASA space program will be emphasized.

490. Special Problems
Fall, Winter, Spring, Summer. 1 to 5 credits. May reenroll for a maximum of 10 credits. Approval of department.
Individual study or project under the direction of a faculty member. An oral report on the work may be required in department seminar.

800. Research Methods
Fall, Winter, Spring, Summer. 2(0-6)
May reenroll for a maximum of 6 credits. Beginning graduate students. Interdepartmental with and administered by the Department of Physics.

Problems and techniques of current research by taking part in the design and setup of experiments, data taking and reduction; study and practice of theoretical methods. Areas of study: solid state and molecular structure, nuclear, elementary particles, astronomy, astrophysics.