

**899. Master's Thesis Research**  
Fall, Spring, Summer. 1 to 8 credits. A student may earn a maximum of 99 credits in all enrollments for this course.  
R: Open only to graduate students in Anthropology. Approval of department.

**999. Doctoral Dissertation Research**  
Fall, Spring, Summer. 1 to 24 credits. A student may earn a maximum of 99 credits in all enrollments for this course.  
R: Approval of department.

**ARABIC**

**Department of Linguistics and  
Germanic, Slavic, Asian and  
African Languages  
College of Arts and Letters**

**101. Elementary Arabic I**  
Fall. 4(4-1)  
Basic standard Arabic, Speaking, listening comprehension, reading and writing, with emphasis on developing oral proficiency skills.

**102. Elementary Arabic II**  
Spring. 4(4-1)  
P: ARB 101 or approval of department.  
Further work on speaking, listening comprehension, reading and writing of standard Arabic, with continued emphasis on developing oral proficiency skills.

**201. Second-Year Arabic I**  
Fall. 4(4-0)  
P: ARB 102 or approval of department.  
Intermediate-level work on speaking, listening comprehension, reading and writing of standard Arabic, with increased emphasis on reading and culture.

**202. Second-Year Arabic II**  
Spring. 4(4-0)  
P: ARB 201 or approval of department.  
Further intermediate-level work on speaking, listening comprehension, reading and writing standard Arabic, with continued increased emphasis on reading and culture.

**290. Independent Study**  
Fall, Spring. 1 to 4 credits. A student may earn a maximum of 8 credits in all enrollments for this course.  
R: Approval of department.  
Special projects arranged by an individual student and a faculty member in areas supplementing regular course offerings.

**490. Independent Study**  
Fall, Spring. 1 to 4 credits. A student may earn a maximum of 8 credits in all enrollments for this course.  
R: Not open to freshmen and sophomores. Approval of department.  
Special projects arranged by an individual student and a faculty member in areas supplementing regular course offerings.

**491. Special Topics in Arabic Studies**  
Fall, Spring. 1 to 4 credits. A student may earn a maximum of 8 credits in all enrollments for this course.  
R: Approval of department.  
Special topics supplementing regular course offerings proposed by faculty on a group study basis.

**ARB**

**ARTS AND LETTERS AL**

**College of Arts and Letters**

**192. Arts and Humanities Freshman Seminar**  
Fall, Spring. 4(4-0)

P: Designated score on English placement test or ATL 1004. R: Not open to students with credit in MC 111 or MC 112 or LBS 133 or ATL 110 or ATL 115 or ATL 120 or AL 125 or ATL 130 or ATL 135 or ATL 140 or ATL 145 or ATL 150 or ATL 195H or AL 192H.  
Drafting, revising, and editing compositions derived from readings on selected arts and humanities topics to develop skills in narration, persuasion, analysis, and documentation. Fulfills Tier I writing requirement.

**192H. Arts and Humanities Freshmen Seminar**  
Fall, Spring. 4(4-0)

R: Open only to freshmen Honors College students or approval of college. Designated score on English placement test. Not open to students with credit in AL 192 or MC 111 or MC 112 or LBS 133 or ATL 110 or ATL 115 or ATL 120 or ATL 125 or ATL 130 or ATL 135 or ATL 140 or ATL 145 or ATL 150 or ATL 195H.  
Critical reading, writing and understanding of modes of discourse. Interdisciplinary topics vary by instructor. Fulfills Tier I writing requirement.

**201. Writing Tutorial**  
Fall, Spring. 2(1-2)

P: Grade of 1.0 or 1.5 in Tier I writing course. C: IAH 201 concurrently.  
Development of writing skills involved in learning and in thinking about and critically reading complex texts.

**292. Introduction to Ancient Studies**  
Fall. 2(1-2) Interdepartmental with Classical Studies, History, and History of Art.  
Methods and current trends in the study of the Greek and Roman world. Visits to library and museum collections.

**390H. Interdisciplinary Perspectives in the Arts and Humanities**

Fall, Spring. 3(3-0) A student may earn a maximum of 6 credits in all enrollments for this course.  
R: Open only to Honors College students and to other students with approval of College of Arts and Letters.  
In-depth selected topics in the arts and humanities drawing on materials and methods of several disciplines.

**400. Overseas Study in Arts and Letters**  
Fall, Spring, Summer. 2 to 8 credits. A student may earn a maximum of 8 credits in all enrollments for this course.

R: Not open to freshmen and sophomores. Approval of college.  
Supervised study of selected topics in the arts, languages, history, philosophy, and religious studies, in relation to particular cultural sites, museums and institutions.

**450. Arts Management**  
Fall of odd-numbered years. 3(3-0) A student may earn a maximum of 6 credits in all enrollments for this course.

R: Not open to freshmen and sophomores.  
Arts organization administration and facilities management. Operations and procedures of performing companies. Funding and financial structure. Audience development and marketing.

**485. Museum Studies**  
Fall of even-numbered years. 3(3-0) Interdepartmental with History of Art.

R: Not open to freshmen and sophomores.  
Activities, functions and organization of museums; the changing role of museums as cultural institutions.

**486. Museum Exhibitions: Theory and Development**  
Spring. 3(2-2)

R: Open only to seniors and graduate students.  
Theoretical and practical approaches to the planning, design, development, installation, and evaluation of museum exhibitions. Field trip required.

**487. Approaches to Museum Education**  
Summer. 3(3-0)

R: Open only to seniors and graduate students.  
Theoretical and practical approaches to the design and development of interpretive materials and programs within museums. Design and development of research and projects.

**491. Special Topics**  
Fall, Spring, Summer. 1 to 4 credits. A student may earn a maximum of 8 credits in all enrollments for this course.

R: Approval of department.  
Special topics supplementing regular course offerings proposed by faculty on group study basis.

**493A. Arts and Letters Internship**  
Fall, Spring, Summer. 2 to 8 credits. A student may earn a maximum of 8 credits in all enrollments for this course.

R: Not open to freshmen and sophomores. A student may earn a maximum of 8 credits in AL 493A and AL 493B combined. Completion of Tier I writing requirement, 12 credits in the major. Approval of college.  
Supervised preprofessional field experience in the arts and humanities.

**493B. Arts and Letters Publications Internship**  
Fall, Spring, Summer. 2 to 4 credits.

R: Not open to freshmen and sophomores. A student may earn a maximum of 8 credits in AL 493A and AL 493B combined. Completion of Tier I writing requirement. Approval of college.  
Introduction to all aspects of preparing College of Arts and Letters publications. Newsletters, brochures, and special events flyers.

**493C. Museum Internship**  
Fall, Spring, Summer. 2 to 3 credits. A student may earn a maximum of 6 credits in all enrollments for this course.

Interdepartmental with History of Art.  
R: Not open to freshmen and sophomores. Approval of college.  
Activities, functions and organization of a university art museum.

**820. Humanistic Perspectives on Health**  
Fall. 3(3-0)

R: Open only to students in the M.A. program in Health and Humanities.  
Multidisciplinary perspectives on health care and medicine, emphasizing linkages among the humanistic and scientific disciplines.

**821. Proseminar in Comparative Literature**  
Fall. 3(3-0) Interdepartmental with English, Romance Languages, and Linguistics and Languages.

R: Approval of college.  
History and practice of comparative literature including foundational concepts and current directions.

**822. Methods of Comparative Literature**  
Spring. 3(3-0) A student may earn a maximum of 6 credits in all enrollments for this course.

Interdepartmental with English, Romance Languages, and Linguistics and Languages.  
P: AL 821 or approval of college. R: Open only to graduate students in College of Arts and Letters.  
Case studies in international literary tradition, reception, and transmission. Approaches to genre and period. History and aesthetics of reception.

**823. Seminar in Comparative Literary Criticism**  
Fall. 3(3-0) A student may earn a maximum of 6 credits in all enrollments for this course. Interdepartmental with English, Romance Languages, and Linguistics and Languages.  
P: AL 822. R: Approval of college.  
Theory and practice of comparative literary criticism, with attention to the development of critical approaches and to current topics in the critical literature.

**825. Comparative Critical Theory**  
Spring. 3(3-0) A student may earn a maximum of 6 credits in all enrollments for this course. Interdepartmental with English, Romance Languages, and Linguistics and Languages.  
P: AL 822 or approval of college. R: Open only to graduate students in College of Arts and Letters.  
Critical theory of comparative literature, including comparative studies in rhetorical theory and discourse analysis.

**829. Capstone Seminar in Health and Humanities**  
Spring. 2(2-0)  
R: Approval of college.  
Peer review of master's theses completed or near completion. Recent works in interdisciplinary approaches to health and humanities.

**899. Master's Thesis Research-Plan A**  
Fall, Spring, Summer. 1 to 6 credits. A student may earn a maximum of 15 credits in all enrollments for this course.  
Directed research leading to a master's thesis, used in partial fulfillment of plan A master's degree requirements.

**999. Doctoral Dissertation Research**  
Fall, Spring, Summer. 1 to 12 credits. A student may earn a maximum of 50 credits in all enrollments for this course.

## ASIAN LANGUAGES ASN

### Department of Linguistics and Germanic, Slavic, Asian and African Languages College of Arts and Letters

**250. Hanzi Writing System and Calligraphy**  
Spring. 3(3-0)  
P: CHS 101 or JPN 102 or approval of department.  
Structure and history of Chinese characters. Calligraphy. Use of Chinese dictionary.

**290. Independent Study**  
Fall, Spring, Summer. 1 to 6 credits. A student may earn a maximum of 9 credits in all enrollments for this course.  
R: Approval of department.  
Special projects in an Asian Languages arranged by an individual student and a faculty member in areas supplementing regular course offerings.

**291. Special Topics in Asian Languages**  
Fall. 1 to 4 credits. A student may earn a maximum of 8 credits in all enrollments for this course.  
R: Not open to students with credit in ASN 491.  
Special topics supplementing regular course offerings proposed by faculty on a group study basis.

**401. East Asian Cultures (W)**  
Fall. 3(3-0) A student may earn a maximum of 6 credits in all enrollments for this course.  
P: IAH 211B or approval of department. R: Completion of Tier I writing requirement.  
Selected topics in the history and culture of China, Japan, and Korea. Topics vary.

**464. Studies in the Literature of Asia and the Asian Diaspora (W)**  
Spring. 3(3-0) A student may earn a maximum of 9 credits in all enrollments for this course. Interdepartmental with English.  
R: Not open to freshmen. Completion of Tier I writing requirement.  
Selected writers, genres, themes, or regions in Asian and Asian diasporic literature.

**490. Independent Study**  
Fall, Spring, Summer. 1 to 6 credits. A student may earn a maximum of 9 credits in all enrollments for this course.  
R: Open only to juniors and seniors. Approval of department.  
Special projects in Asian Languages arranged by an individual student and a faculty member in areas supplementing regular course offerings.

**491. Special Topics in Asian Languages**  
Fall, Spring. 1 to 6 credits. A student may earn a maximum of 9 credits in all enrollments for this course.  
R: Open only to juniors and seniors. Approval of department.  
Special topics supplementing regular course offerings proposed by faculty on a group study basis.

## ASTRONOMY AND ASTROPHYSICS AST

### Department of Physics and Astronomy College of Natural Science

**101. The Celestial Clockworks**  
Spring. 1(1-0)  
Relationship between ancient skylore and timekeeping. Establishment of a calendar and celestial navigation. Development of the Greek horoscope as a time recorder and coordinate system.

**201. Astrophysics and Astronomy I**  
Fall. 3(4-0)  
P: PHY 183 or PHY 183B or PHY 193H; MTH 132 or MTH 152H.  
Overview of the universe: the celestial sphere, orbits, spectra, the solar system, stars, and stellar evolution.

**202. Astrophysics and Astronomy II**  
Spring. 4(3-2)  
P: AST 201; PHY 184 or PHY 184B or PHY 294H; MTH 234 or MTH 254H, or concurrently.  
Interstellar medium, the milky way, galaxies, and the large-scale structure of the universe. Coordinate systems, instruments, and data analysis.

**301. Junior Research Seminar**  
Spring. 1(1-0) A student may earn a maximum of 4 credits in all enrollments for this course.  
P: AST 202. R: Completion of Tier I writing requirement.  
Preparation and presentation of a review paper on a current topic in astronomy or astrophysics.

**310. Directed Studies**  
Fall, Spring, Summer. 1 to 3 credits. A student may earn a maximum of 6 credits in all enrollments for this course.  
P: AST 202. R: Approval of department.  
Individual study or project in astronomy or astrophysics under the direction of a faculty member.

**401. Stars**  
Fall. 3(3-0)  
P: AST 202, PHY 321 or concurrently.  
Physical processes that determine the structure and evolution of stars. Results of stellar evolution theory. Stellar atmospheres. Observations of stars.

**402. Galaxies**  
Spring. 3(3-0)  
P: AST 401, PHY 481.  
Contents and dynamics of the milky way. Mass and luminosity distributions of galaxies. Stellar populations. The interstellar medium. Evolution of galaxies. Active galactic nuclei.

**410. Senior Thesis**  
Fall, Spring. 1 to 4 credits. A student may earn a maximum of 4 credits in all enrollments for this course.  
R: Open only to seniors in Astrophysics. Completion of Tier I writing requirement.  
Design and execute an original experiment or computation. A written and oral report of the research is required.

**800. Research Methods**  
Fall, Spring, Summer. 3(3-0) A student may earn a maximum of 6 credits in all enrollments for this course.  
P: AST 801.  
Apprenticeship in astrophysical research; student will work closely with individual faculty member learning research techniques.

**801. Introduction to Astrophysics**  
Fall. 3(3-0)  
Survey of contemporary astrophysics. Stellar evolution, the structure of the Milky Way, the properties of external galaxies, and cosmology.

**810. Radiation Astrophysics**  
Spring of odd-numbered years. 3(3-0)  
P: AST 801.  
Transfer of radiation through plasmas and processes for emission and absorption of photons. Interpretation of the spectra of stars, interstellar medium, and galaxies.

**820. Advanced Topics in Astrophysics (MTC)**  
Fall, Spring. 3(3-0) A student may earn a maximum of 9 credits in all enrollments for this course.  
P: AST 801.  
Advanced work in a specialized astrophysical topic.

**830. Galactic and Extragalactic Dynamics**  
Fall of even-numbered years. 3(3-0)  
P: AST 801, PHY 820.  
Implications of gravitational dynamics and stellar evolution on galactic and extragalactic systems.

**840. Stellar Astrophysics**  
Spring of even-numbered years. 3(3-0)  
P: AST 801.  
Physics of stellar interiors. Methods for calculating stellar models. Principles of stellar evolution.

**850. Electrodynamics of Plasmas**  
Spring of odd-numbered years. 3(3-0) Interdepartmental with Electrical Engineering and Physics. Administered by Electrical Engineering.  
P: EE 835 or PHY 488.  
Plasma kinetic and macroscopic plasma transport theory. Electromagnetic wave propagation and charged particle diffusion processes in plasma. Electromagnetic energy absorption via elastic and inelastic collisions. Dc, rf, and microwave discharges.

**860. Gravitational Astrophysics and Cosmology (MTC)**  
Fall, Spring. 3(3-0) A student may earn a maximum of 6 credits in all enrollments for this course.  
Topics in general relativity, gravitational astrophysics, and cosmology.

**870. Astronomical Instrumentation and Data Analysis**  
Fall of odd-numbered years. 3(3-0)  
P: AST 801.  
Theory and techniques of astronomical data acquisition and analysis.