

890A Individual Readings
Fall, Spring, Summer. 1 to 8 credits. A student may earn a maximum of 16 credits in all enrollments for this course. R: Open only to graduate students. Approval of department.

Advanced study, based on prior preparation, under faculty direction.

890B Individual Research
Fall, Spring, Summer. 1 to 8 credits. A student may earn a maximum of 16 credits in all enrollments for this course. R: Approval of department.

Graduate student projects under faculty direction.

892 Seminar in Anthropology
Fall, Spring, Summer. 1 to 4 credits. A student may earn a maximum of 12 credits in all enrollments for this course. R: Open only to graduate students in Anthropology. Approval of department.

Studies in selected fields.

893 Internship in the Professional Applications of Anthropology
Fall, Spring, Summer. 1 to 3 credits.

Supervised professional experience in federal or state agencies, nonprofit organizations, or corporations related to the professional practice of anthropology.

894 Forensic Anthropology Internship in Forensic Pathology

Fall, Spring, Summer. 1 to 4 credits. A student may earn a maximum of 4 credits in all enrollments for this course. P:M: (ANP 842) RB: graduate coursework in human anatomy and skeletal biology

Supervised professional internship in postmortem analysis. Students will attend autopsies and learn procedures that are relevant for forensic anthropology. Individual research project.

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.

Master's thesis research.

901 Management and Resource Anthropology

Spring of even years. 2(6-0) R: Approval of department.

Issues in the practice of anthropology, including the ethical, effective, and efficient conduct and management of applied research in cultural anthropology and archaeology in the private sector, in non-profit agencies, and in government.

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.

Doctoral dissertation research.

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:M: (ARB 101)

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:M: (ARB 102)

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:M: (ARB 201)

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 or 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

192 Arts and Humanities First-Year Seminar
Fall, Spring. 4(4-0) P:M: (ATL 1004) or designated score on English placement test. SA: AL 192H Not open to students with credit in AL 192H 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 or LBS 133 or MC 111 or MC 112.

Theme based exploration of connections across arts and humanities disciplines. Development of skills necessary for successful study of arts and humanities. Significant writing component including drafting, revising, and editing compositions to develop skills in narration, persuasion, analysis, and documentation. Fulfills Tier I writing requirement.

192H Arts and Humanities First-Year Seminar

Fall, Spring. 4(4-0) P:NM: Designated score on English placement test. R: Open only to freshman Honors College students or approval of college. Not open to students with credit in AL 192 or ATL 110 or ATL 120 or ATL 125 or ATL 130 or ATL 135 or ATL 140 or ATL 145 or ATL 150 or ATL 195H or LBS 133 or MC 111 or MC 112 or ATL 115.

Theme based exploration of connections across arts and humanities disciplines. Development of skills necessary for successful study of arts and humanities. Significant writing component including drafting, revising, and editing compositions to develop skills in narration, persuasion, analysis, and documentation. Fulfills Tier I writing requirement.

200 Cultural Difference and Study Abroad
Fall, Spring. 3(3-0)

Tools for understanding and interacting with individuals from different cultural backgrounds. Awareness of and sensitivity to cultural difference and the role of language study in understanding cultural difference. Preparation for continued study of and exposure to different cultures and languages through study abroad.

201 Writing Tutorial

Fall, Spring. 2(1-2) P:NM: 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.

250 Career Strategies for Arts and Letters Students

Fall. 1(2-0) RB: Declared major preference in the College of Arts and Letters. R: Open only to undergraduates in the College of Arts and Letters.

Identify, explore, and prepare for suitable career options. Topics include self-assessment, career development strategies, and job search skills.

291 ROIAL Sophomore Seminar

Fall. 2(2-0) P:M: (AL 191) R: Open only to ROIAL students. Not open to freshmen.

Continuation of the Freshman Seminar (AL 191). The role of art in different cultures. What "humanities" means in different cultures and communities and the ways in which the arts and humanities contribute to making us all part of a global community. Expansion from the role of arts and humanities in local communities to comparative study of "arts" and "humanities" across cultures.

292 Introduction to Ancient Studies

Fall. 2(1-2) Interdepartmental with Classical Studies; History of Art; History.

Methods and current trends in the study of the Greek and Roman world. Visits to library and museum collections.

ARTS AND LETTERS AL

College of Arts and Letters

191 ROIAL Freshman Seminar

Fall. 2(2-0) R: Open only to ROIAL students. Academic life as a Residential Option in Arts and Letters (ROIAL) student. The nature and roles of the arts and humanities in individual and community lives. Special topics and activities focused on the arts and humanities and designed to build community.

Arts and Letters—AL

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 Study Abroad 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. 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.

485 Museum Studies

Fall. 3(3-0) Interdepartmental with History of Art. Administered by Department of History of Art. R: Not open to freshmen or sophomores. Not open to students with credit in AL 485.

Activities, functions and organization of museums; the changing role of museums as cultural institutions.

487 Approaches to Museum Education

Spring, Summer. 3(3-0) Interdepartmental with History of Art. Administered by Department of History of Art. R: Open only to juniors or seniors or graduate students. Not open to students with credit in AL 487.

Theoretical and practical approaches to the design and development of interpretive materials and programs within museums. Design and development of research and projects.

488 Museum Curatorial Practices

Fall, Summer. 3(3-0) Interdepartmental with History of Art. Administered by Department of History of Art. P:NM: (HA 485) R: Open only to juniors or seniors or graduate students.

Methods and practices for the development, care, and use of museum collections in research, education, and exhibition activities.

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 college.

Special topics supplementing regular course offerings proposed by faculty on group study basis.

492 Special Topics in Museum Studies

Fall, Spring, Summer. 1 to 3 credits. A student may earn a maximum of 6 credits in all enrollments for this course. Interdepartmental with History of Art. Administered by Department of History of Art. R: Open only to juniors or seniors or graduate students.

Special topics supplementing regular course offerings.

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. P:M: Completion of Tier I writing requirement. P:NM: 12 credits in the major. R: Not open to freshmen or sophomores. Approval of college.

Supervised preprofessional field experience in the arts and humanities.

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. Administered by Department of History of Art. R: Not open to freshmen or sophomores. Approval of college.

Activities, functions and organization of a museum.

494 Museum Exhibitions: Theory and Development

Spring. 3(2-2) Interdepartmental with History of Art. Administered by Department of History of Art. R: Open only to juniors or seniors or graduate students. Not open to students with credit in AL 486.

Theoretical and practical approaches to the planning, design, development, installations, and evaluation of museum exhibitions. Field trip required.

495 Research-Mentoring in Black American and Diasporic Studies

Fall, Spring. 3(3-0) RB: Courses in African American Literature, African American History, African American Language Use, other courses in the Black American and Diasporic Studies Program. R: Open only to students in the Specialization in Black American and Diasporic Studies.

Focus on readings and research in the human arts and sciences. Each student works with a black American and diasporic studies faculty mentor in the student's area of study. Training in knowledge creation, production and dissemination.

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; Linguistics and Languages; Romance Languages. R: Open only to graduate students in the College of Arts and Letters.

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; Linguistics and Languages; Romance Languages. R: Open only to graduate students in the 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; Linguistics and Languages; Romance Languages. R: Open only to graduate students in the College of Arts and Letters.

Theory and practice of comparative literary criticism, with attention to the development of critical approaches and to current topics in the critical literature.

825 Museum Internship

Spring. 3(3-0) A student may earn a maximum of 6 credits in all enrollments for this course. Interdepartmental with English; Linguistics and Languages; Romance Languages. R: Open only to graduate students in the 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.

840 Writing in the Sciences

Fall, Spring, Summer. 2(2-0) A student may earn a maximum of 6 credits in all enrollments for this course. Interdepartmental with Natural Science. Administered by Natural Science.

Discussion and critique of students' writing in peer response workshop groups

881 Special Topics in Teaching with Technology in Arts and Humanities

Fall, Spring, Summer. 1 to 3 credits. A student may earn a maximum of 6 credits in all enrollments for this course. RB: Familiarity with Macintosh or Windows platform.

Teaching with technology in the arts and humanities. Implications of technology for learning strategies and course design, disciplinary and cross-disciplinary applications of technology, testing on the Web, implications of broader access to knowledge for student research and writing, and distance learning.

890 Independent Study

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 college.

Special projects, directed reading, and research arranged by an individual graduate student and a faculty member in areas supplementing regular course offerings.

893 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. Administered by Department of History of Art. R: Open only to juniors or seniors or graduate students.

Activities, functions and organization of a museum.

898 Master's Research

Fall, Spring, Summer. 1 to 3 credits. A student may earn a maximum of 3 credits in all enrollments for this course.

Directed research in support of Plan B Master's program requirements

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.
 Doctoral dissertation research.

ASIAN LANGUAGES ASN

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

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. 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:M: (IAH 211B) and completion of Tier I writing requirement. SA: AL 401
 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. P:M: 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 or 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 or 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:M: (PHY 183 or PHY 183B or PHY 193H) and (MTH 132 or MTH 152H or LBS 118)
 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:M: (AST 201) and (PHY 184 or PHY 184B or PHY 294H) and (MTH 234 or concurrently or MTH 254H or concurrently or LBS 220 or concurrently)
 Interstellar medium, the milky way, galaxies, and the large-scale structure of the universe. Coordinate systems, instruments, and data analysis.

207 The Science of Astronomy
 Fall. 3(3-0) P:M: (PHY 231 or concurrently or PHY 231B or concurrently or ISP 205 or concurrently or PHY 181B or concurrently or PHY 183 or concurrently or PHY 183B or concurrently or LBS 271 or concurrently or PHY 231C or concurrently) and (MTH 116 or concurrently or MTH 114 or concurrently or LBS 117 or concurrently) Not open to students with credit in AST 201.
 In-depth study of one topic in astronomy with emphasis on key discoveries. Topics may be cosmology, the solar system, and the life of stars. Observing with portable telescopes.

301 Junior Research Seminar
 Fall, Spring. 1(1-0) P:M: (AST 202) and 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 4 credits in all enrollments for this course. P:M: (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:M: (AST 202 and PHY 321)
 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:M: (AST 401 and 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, Summer. 1 to 4 credits. A student may earn a maximum of 5 credits in all enrollments for this course. P:M: (AST 301) and 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:NM: (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.

802 Techniques of Modern Astrophysics
 Fall, Spring. 3 credits. P:NM: (AST 801)
 Students are introduced to modern astrophysics through participation in short projects involving literature surveys, professional planning, and research in observational, theoretical, and computational astrophysics.

810 Radiation Astrophysics
 Spring of odd years. 3(3-0) P:NM: (AST 801 and PHY 841)
 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
 Fall, Spring. 3(3-0) A student may earn a maximum of 9 credits in all enrollments for this course. P:NM: (AST 801)
 Advanced work in a specialized astrophysical topic.

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

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

850 Electrodynamics of Plasmas
 Spring of odd years. 3(3-0) Interdepartmental with Electrical and Computer Engineering; Physics. Administered by Department of Electrical and Computer Engineering. P:NM: (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.