ARTS AND LETTERS

College of Arts and Letters

350H. Perspectives in Literature
Fall. 4(3-0) Juniors, approval of the 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 the Honors College.
The two primary areas of concern will be ethics and aesthetics, with 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 field, and the preparation of a substantial paper.

392H. Perspectives in History
Spring. 4(3-0) Juniors, approval of the 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 development of the power structure since 1945.

450. Arts Management
Fall, Winter, Spring. 5 to 6 credits. May re-enroll 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 administrative and contemporary trends in arts management field.

999. Research
Fall, Winter, Spring, Summer. Variable credit. May re-enroll for a maximum of 36 credits. Approval of college.

ASTRONOMY AND ASTrophysics

College of Natural Science

117. Introductory Observing
Fall, Spring. 1(0-2) 119, or 217, or 229 or concurrently and approval of department.
Observations of celestial objects, constellation identification, and occasional planetarium exercises.

119. General Astronomy
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: 119, 217, 229.
Physical nature of solar system, stars, clusters, and galaxies as seen by modern astronomers. Limited opportunity for astronomical observations.

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

121. General Astronomy
Fall, Winter. 4(4-0) PHY 287 or 291 or concurrently. Students may not receive credit in more than one of the following: 119, 217, 229.
Descriptive course intended primarily for physical science majors. A semi-quantitative discussion of time, telescopes, the solar system, stars, clusters of stars, galaxies, and cosmology. Limited opportunity for astronomical observations.

229. General Astronomy
Spring. 4(4-0) PHY 287 or 291 or concurrently. Students may not receive credit in more than one of the following: 119, 217, 229.
Fundamental observations in astronomy and their interpretation through physical laws. Tended 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
Spring. 3(3-0) 217, MTH 113.

375. Contemporary Astronomy
Winter. 3(3-0) 119 or 217 or 229; MTH 113 recommended.
A continuation of General Astronomy with particular emphasis on modern developments. Includes interstellar matter, star formation, stellar evolution through final stages, supernovae, pulsars, neutron stars, galaxies and cosmology.

437. Observatory Practice
Fall, 3(1-4) 327 and approval of department.

458. Astrophysics
Winter. 3(3-0) 217 or 229, PHY 289, or approval of department.
Application of physical principles to the atmosphere and interiors of stars to 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 re-enroll 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 re-enroll 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 mathematical techniques. Areas of study: solid state and molecular structure, nuclear, elementary particles, astronomy, astrophysics.

801. Seminar
Winter. 1(0-4) May re-enroll for a maximum of 2 credits. Graduate students or approval of department.
Seminars to be presented by both faculty and students to review papers in the current astronomical research literature.

819. Stellar Structure
Spring of even-numbered years. 3(3-0)
or PHY 395 or approval of department.

828. Galactic Structure
Winter of even-numbered years. 3(3-0)
PHY 437 or approval of department.
Distribution and dynamics of stars and interstellar material in our galaxy. Spiral structure. Galactic evolutions.

829. Extragalactic Astronomy and Observational Cosmology
Spring of even-numbered years. 3(3-0)
Approval of department.
Properties of galaxies, including evolution, luminosity, masses, and clustering tendencies. The velocity-distance relation and the extragalactic distance scale. Radio sources, quasars, cosmic microwave background radiation.

850. Ionized Cases
Spring. 3(3-0) E E 835 or PHY 448. Interdepartmental with the Physics Department and Electrical Engineering, and administered by Electrical Engineering.
Elastic collision processes. Boltzmann equation; moment equations; basic plasma phenomena; motion of a charged particle in electrical and magnetic field; individual and collective charged particle behavior.

859. Stellar Atmospheres
Spring of odd-numbered years. 3(3-0)
or PHY 395 or approval of department.
The physics of radiation and the equation of its transfer. Theory of absorption coefficient and line absorption profiles. The gray atmosphere and calculation of model atmospheres.

860. General Relativity and Cosmology I
Fall of even-numbered years. 3(3-0)
PHY 856 or approval of department. Interdepartmental with and administered by the Physics Department.
Conceptual foundations of general relativity theory; elements of tensor calculus; Riemann-Christoffel curvature tensor; the field equations; experimental tests; special solutions; the extension to cosmology.

881. General Relativity and Cosmology II
Winter of odd-numbered years. 3(3-0)
Interdepartmental with and administered by the Physics Department.
Relativistic cosmology: the model universes; stead-state theory; observational evidence and possibilities for decision among models; current problems.
444. Oral Language of Urban Areas
Winter, Summer. 3(3-0)
Concentration in the characteristics of language and human communication as these relate to studies and practices of those involved in urban affairs.

454. Introduction to Audiology
Fall, Spring. 5(4-1) 276, 277.
Fundamental aspects of normal hearing; hearing disorders, hearing tests.

460. Aural Rehabilitation
Winter, Summer. 5(4-1) 454 or approval of instructor.
Fundamental aspects of hearing aids, auditory training, and speechreading for the hearing-impaired person.

470. Communication Disorders
Spring, Summer. 3(3-0) Juniors. Not open to Audiology and Speech Sciences majors.
An overview of communication disorders; the professions of speech and language pathology and audiology and their relationships to allied professions.

474. Clinical Practicum in Speech and Language Pathology
Fall, Winter, Spring, Summer. 3(3-0) 1 credit.
May re-enroll for a maximum of 2 credits. Grades of 2.0 or better in both 373 and 379.
Therapeutic experience in speech and language pathology.

476. Speech Pathology II: Diagnostics
Fall, Winter, Spring, Summer. 5(3-2) 474 or approval of department.
Test procedures and analyses; supervised clinical experience in language and speech evaluation and report writing.

477. Methods in Public School Speech and Hearing Therapy
Fall, Winter, Spring. 4(3-4) 372.
Must be taken prior to term of student teaching. Administration and organization, procedures and materials in public school speech and hearing therapy.

499. Independent Study
Fall, Winter, Spring, Summer. 1 to 6 credits. May re-enroll for a maximum of 12 credits. Approval of department.

832. Speech and Hearing Evaluation and Therapy
A. Hearing Handicap
Summer. 4(2-2)
A theoretical approach to the study of the aural rehabilitative process.

B. Cerebral Palsy
Spring. 4(3-0)
Evaluation, symptomatic study, structural and functional consideration of cerebral palsy. Therapeutic procedures for the speech of the cerebral palsied.

C. Delayed Language Development
Winter. 4(3-0)
Evaluative techniques including audiometry, psychometry, and case history as aids to the differential evaluation of delayed language development.

D. Mental Retardation
Summer. 4(3-0)
Language behavior and speech development of the mentally retarded as related to all facets of personal-social development and adjustment.

E. Stuttering
Fall. 4(3-0)
Longitudinal study of stuttering theories and the therapies accompanying them.

F. Cleft Palate
Summer. 4(3-1)
Etymology, symptomatology, structural and functional consideration of cleft palate. Therapeutic procedures for the speech habilitation of cleft palate individuals.

833. Specialized Clinical Audiology
A. Differential Audiology
Fall. 4(3-0)
Pure tone audiometric tests as an aid to the otologist in evaluating the pathology of hearing loss; including the development of normative and monaural loss.

B. Speech Audiology and Evaluation of Hearing Aids
Fall. 4(3-0)
Speech audiometry, principles and methods in the selection of hearing aids; physical characteristics of hearing aids.

C. Industrial Audiology
Spring. 4(3-2)
Evaluation of the role of the audiologist in industry emphasizing identification procedures, damage-risk criteria, measurement and control of noise, conservation procedures, and medicolegal problems.

D. Advanced Audiological Evaluation
Winter. 4(3-1)
Theory, administration and evaluation of selected tests including Bekesy, EDR, EEC, and advanced speech and audiometric tests.

E. Pediatric Audiology
Winter. 4(3-2)
Evaluation of procedures including play audiometry, language assessment, and case studies as aids to the differential diagnosis of auditory disorders in children; habilitative procedures for the acoustically handicapped child.

833. Speech Perception: Theory and Measurement
Fall. 4(4-0) Approval of department.
Evaluation and analysis of various theories of speech perception and their implications for speech and language pathologists, audiologists, and speech and hearing scientists.