Astronomy*  AST

College of Natural Science

119. General Astronomy (PHY 119) Winter, Spring, Summer. (4-4-0) Not open to engineering or physical science majors. Students may not receive credit in both 119 and 217.

Physical nature of solar system, stars, and galaxies as seen by modern astronomers. Limited opportunity for astronomical observations.

217. General Astronomy (PHY 217) Fall, Winter, (4-4-0) May not receive credit in both 217 and 119.

Descriptive course intended primarily for physical science majors. A semi-quantitative discussion of time, teleopes, the solar system, stars, clusters of stars, galaxies, and cosmology. Limited opportunity for astronomical observations.

327. Practical Astronomy

Fall. 3(3-0) 217, MTH 113.

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

437. Observatory Practice

Fall. 3(1-4) 217 and MTH 113.


459. Astrophysics Winter. 3(3-0) PHY 289 or approval of department.

Properties of a gas under conditions of astrophysical interest. Atomic spectroscopy. Emission and absorption of radiation. Physical properties of stellar atmospheres and other astronomical objects as inferred from the spectra.

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. 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.

819. Stellar Structure Spring. 3(3-0) 458 or PHY 395 or approval of department.


829. Galactic Structure Winter of even-numbered years. 3(3-0) PHY 427 or approval of department.

Distribution and dynamics of stars and interstellar material in our galaxy. Spiral structure. Galactic evolution.

839. Celestial Mechanics Spring of even-numbered years. 3(3-0) PHY 427 or approval of department.


* Effective Fall 1968. Formerly part of Department of Physics and Astronomy.

Audiology and Speech Sciences—Descriptions of Courses

470. Speech Correction for Teachers Fall, Winter, Spring, Summer. 3(3-0) Juniors. Not open to speech pathology and audiology majors.

Meeting needs of the speech handicapped child in classroom.

473. Speech Pathology II Spring. 5(3-0) 372 or approval of department.

Etiology and symptomatology of disorders of the nervous system and maxillo-facial anomalies resulting in speech and/or language problems of children.

474. Clinical Practice in Speech Correction Fall, Winter, Spring, Summer. 1 to 3 credits. May re-enroll for a maximum of 12 credits. Approval of department.

531. Speech and Hearing Problems of Adults

A. NEUROPATHOLOGIES OF SPEECH

Winter. 4(3-0)Neuropathology, symptomatology, and speech and language rehabilitation of adults.

B. VOICE DISORDERS

Spring. 4(3-0)

Etiology, symptomatology, and therapeutic procedures for disorders of voice. Speech pathologist and audiologist in relation to other disciplines in the rehabilitation of adults with voice disorders.

832. Speech and Hearing Evaluation and Therapy

A. HEARING LOSS

Summer. 4(3-0) Review, evaluation, and development of techniques employed in lipreading training, auditory training, hearing aid orientation, and counseling for the acoustically handicapped.

B. CEREBRAL PALSY

Spring. 4(3-0)

Etiology, symptomatology, and 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

Winter. 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
Summer. 4(2-0)
Longitudinal studies of stuttering theories and the therapies accompanying them.

F. Cleft Palate
Fall. 4(2-0)
Etiology, symptomatology, structural and functional considerations of cleft palate. Therapeutic procedures for the speech habilitation of cleft palate individuals.

533. Specialized Clinical Audiology
A. Differential Audiometry
Winter. 4(3-0)
Pure tone audiometric tests as an aid to the audiologist in evaluating the pathology of hearing loss; including the development of norms. Consideration of nonorganic loss.

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

C. Industrial Audiology
Summer. 4(2-2)
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
Spring. 4(2-2)
Theory, administration and evaluation of selected tests including Bekesy, EDR, EEG, and advanced speech-audiometric tests.

E. Pediatric Audiology
Spring. 4(2-2)
Evaluation 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.

554. Psychophysics and Theories of Audition
(554A.) Spring. 4(3-0)
Nature of auditory stimulus and the results of psychophysical experimentation in audition.

574. Speech and Hearing Problems in Public Schools
Summer. 4(3-0) May re-enroll for a maximum of 12 credits.
Graduate seminar in speech and hearing involving problems that arise in relation to speech and hearing therapy in the public schools.

580A. Mathematical Measurement of Speech and Hearing Variables
Fall. 4(4-0)
Application of mathematical models in the analysis of hearing and speech processes.

580B. Acoustic Phonetics
(575C.) Winter. 4(2-2) 880A or approval of department.
An analytic study of the acoustics of speech.

580C. Instruments and Electronics for Audiology and Speech Sciences
(575A) Spring. 4(2-0) 880B or approval of department.
A discussion of the electronic principles and instruments necessary to measure parameters related to hearing and speech processes.

880D. Experimental Phonetics
(875B) Summer. 4(3-0) 880C or approval of department.
Critical review of the literature in experimental phonetics with special reference to the historical development of the field and subsequent experimentation in physiological and acoustical phonetics.

599. Research
Fall, Winter, Spring, Summer. Variable credit. Approval of department.

940. Seminar in Audiology and Speech Sciences
Spring, Summer. 4(2-0) May re-enroll for maximum of 16 credits.

980. Special Problems in Audiology and Speech Sciences
Fall, Winter, Spring, Summer. 1 to 6 credits. Special projects in audiology and speech sciences.

999. Research
Fall, Winter, Spring, Summer. Variable credit. Approval of department.

BIOCHEMISTRY BCH

College of Agriculture and Natural Resources

College of Human Medicine
College of Natural Science

200. Introduction to Biochemistry
Winter, Summer. 5(3-0) General chemistry; one term organic chemistry. Not acceptable for a B.S. degree in biochemistry. Survey of biochemistry emphasizing the major metabolic activities of living organisms.

363. Clinical Biochemistry
Spring. 3(3-3) 200; CEM 162. Primarily for Medical Technology majors; not acceptable for a B.S. degree in biochemistry. Quantitative clinical laboratory methods.

400H. Honors Work
Fall, Winter, Spring. Variable credit. Approval of department. Assigned reading and experimentation.

401. General Biochemistry 1
Fall, Spring. 5(3-0) One year organic chemistry or CEM 242. General biochemistry, emphasizing metabolism, structure and function of the major components of living cells.

402. General Biochemistry II
Winter. 3(3-0) 401. Continuation of 401 with special emphasis on regulatory processes.

403. General Biochemistry III
Spring. 2(2-0) 401; physical chemistry recommended. Continuation of 401 with special emphasis on enzymology.

404. General Biochemistry Laboratory I
Fall, Winter, Spring. 3(1-8) Analytical chemistry; 401. Laboratory course based on the subject matter of 401.

478. Senior Seminar
Fall, Winter, Spring, Summer. 1 to 4 credits. May re-enroll for a maximum of 12 credits. Approval of department.
A course designed to give qualified undergraduate students an opportunity to gain experience in biochemical research.

801. Biochemical Research Methods
Fall. 1(0-3). One year organic chemistry or CEM 242; 401 or concurrently. Discussions and demonstrations of selected experimental techniques of wide application in biochemistry.

802. Advanced Biochemistry 1
Winter. 3(3-0) 401, physical chemistry; advanced organic chemistry desirable. Physical biochemistry, enzyme structure and function.

803. Advanced Biochemistry II
Spring. 3(3-0) 401, physical chemistry; Nucleic acids, protein biosynthesis, and regulatory mechanisms.

804. Advanced Biochemistry Laboratory I
Fall. 3(1-3) Analytical chemistry; 401 concurrently; biochemistry majors or approval of department. Experiments to be selected from a representative group illustrating modern biochemical research.

805. Advanced Biochemistry Laboratory II
Winter. 3(1-6) 804 concurrently; 801.
Experiments to be selected from a representative group illustrating modern biochemical research.

806. Advanced Biochemistry Laboratory III
Spring. 3(1-6) 805; 803 concurrently. Special experiments in advanced laboratory techniques.

855. Special Problems
Fall, Winter, Spring, Summer. Variable credit. May re-enroll for a maximum of 12 credits. Approval of department. Consideration of current problems.

599. Research
Fall, Winter, Spring, Summer. Variable credit. Approval of department.

960. Selected Topics in Biochemistry
Fall, Winter, Spring, Summer. 1(1-0) or 2(2-0) May re-enroll for a maximum of 6 credits if a different topic is taken. Approval of department.
Topics will be selected from the areas of biochemical genetics, biochemistry of development, biochemical evolution, complex proteins, lipid metabolism, immunology, hormones, control mechanisms and structure of biological macromolecules.

961. Selected Topics in Biochemistry
Fall, Winter, Spring, Summer. 1(1-0) or 2(2-0) May re-enroll for a maximum of 6 credits if a different topic is taken. Approval of department.
Topics will be selected from the areas of bioenergetics, bioinstrumentation, complex carbohydrates, mechanisms of enzyme action, natural products, carbohydrate metabolism, mass spectrometry and biochemistry of isoprenoid compounds.