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, star clusters, and galaxies as seen by modern astronomers. Limited opportunity for astronomical observations.

217. General Astronomy

(PHY 217.) Fall, Winter. 4(4-0) MTH 102. Students may not receive credit in both 217 and 119.

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.

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 ephemerides. Finding charts and setting of equatorial telescopes.

437. Observatory Practice

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

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) 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.

Physical properties of the stellar interior. Methods of calculating models. Stellar evolution. Comparison of theory with current observations.

828. 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.

Two-body, three-body, and n-body problems. Orbital elements. Potential of solid objects. Orbital motion and perturbations for planets, rockets, and satellites.

* Effective Fall 1966. Formerly part of Department of Physics and Astronomy.

850. Ionized Gases

Spring. 3(3-0) E E 835 or PHY 448. Interdepartmental with and administered by the Electrical Engineering Department.

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.

989. Waves and Radiations in Plasmas

Fall of even-numbered years. 3(3-0) E E 850. Interdepartmental with and administered by the Electrical Engineering Department.

Plasma oscillation; interaction, electromagnetic fields with plasmas, wave propagation in magnetionic media; plasma sheath; rediation of electric source in incompressive and compressive plasmas; electroacoustic waves; magnetohydrodynamics; research topics in plasmas.

AUDIOLOGY AND SPEECH SCIENCES* ASC

College of Communication Arts

093. Remedial Speech

Fall, Winter, Spring, Summer. 0(2-0) [2(2-0)]†.

Special help in relieving or compensating for disorders of speech.

108. Voice and Articulation

Fall, Winter, Spring, Summer. 3(4-0)

The study and development of the skills of voice and articulation.

222. Oral Language Development

Winter, Summer. 3(2-0)

Emergence and development of receptive and expressive aspects of oral language of the child.

276. Descriptive Phonetics

(275.) Fall, Spring. 3(2-2)

Detailed description of the principles that underlie the production of speech sounds.

277. Scientific Bases of Voice Communication Process

(275.) Winter, Spring. 3(3-0)

Scientific bases of voice communication with special reference to the acoustic aspect of production.

372. Speech Pathology I

Fall, Winter. 5(3-0) 276, 277.

Etiology, symptomatology, and rationale of therapy for speech and language problems.

373. Clinical Procedures in Speech Pathology and Audiology

Winter, Spring, Summer. 4(2-2)

Principles underlying the clinical interview and client relationships essential to diagnosis and therapy. Procedures in obtaining, recording, and evaluating test results and therapeutic methods.

454. Audiology I

Fall, Winter, Spring, Summer. 5(3-0) 276, 277.

Fundamental aspects of hearing; nature, testing and rehabilitation.

460. Audiology II

Winter. 5(3-0) 454 or approval of department.

Theory and methodology in the teaching of lipreading and auditory training to the acoustically handicapped.

*Effective July 1, 1967. Courses formerly in Speech Department.

† See page A-2 item [3]

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 credit. Six credits required for certification. 372.

475. Structures and Functions of Speech and Hearing Mechanisms

(854A.) Winter. 3(3-0) Approval of department.

Peripheral and central auditory mechanisms and the respiratory, phonatory and articulatory mechanisms for speech.

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.

831. 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(2-0)

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(2-1)

Etiology, symptomatology, 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(3-0)

Longitudinal studies of stuttering theories and the therapies accompanying them.

F. Cleft Palate

Fall. 4(2-0)

Etiology, symptomatology, structural and functional consideration of cleft palate. Therapeutic procedures for the speech habilitation of cleft palate individuals.

833. Specialized Clinical Audiology

A. Differential Audiometry

Winter. 4(3-0)

Pure tone audiometric tests as an aid to the otologist 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 medico-legal 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)

Evaluative 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.

854. Psychophysics and Theories of Audition

(854B.) Spring. 4(3-0)

Nature of auditory stimuli and the results of psychophysical experimentation in audition.

874. Speech and Hearing Problems in Public Schools

Summer. 4(3-0) May re-enroll for a maximum of 16 credits.

Graduate seminar in speech and hearing involving problems that arise in relation to speech and hearing therapy in the public schools.

880A. Mathematical Measurement of Speech and Hearing Variables

Fall. 4(4-0)

Application of mathematical models in the analysis of hearing and speech processes.

880B. Acoustic Phonetics

(875C.) Winter. 4(2-2) 880A or approval of department.

An analytic study of the acoustics of speech.

880C. Instruments and Electronics for Audiology and Speech Sciences

(875A.) 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(2-0) 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.

899. 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.

990. 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(5-0) 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(2-3) 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 I

Fall, Spring. 5(5-0) 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(1-6) Analytical chemistry; 401.

Laboratory course based on the subject matter of 401.

478. Senior Seminar

Fall, Winter, Spring. 0 or 1(1-0). May re-enroll for a maximum of 2 credits. Undergraduate biochemistry major or approval of department.

Discussion, by undergraduate students and staff, of recent advances in biochemistry.

499. Research

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 I

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(1-6) Analytical chemistry; 801 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) 802 concurrently; 804.

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.

899. 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, immunochemistry, 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.