801. Seminar

Winter. 1(1-0) May reenroll 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) AST 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.

850. Ionized Gases

Fall. 3(3-0) E E 835 or PHY 448; E E 874. Interdepartmental with Electrical Engineering and the Department of Physics and administered by Electrical Engineering.

Elastic collision processes; Boltzmann equation; moment equations; motion of a charged particle in electrical and magnetic field; individual and collective charged particle behavior; macroscopic properties of plasmas, waves in the fluid plasma; transport phenomena in plasma.

859. Stellar Atmospheres

Spring of odd-numbered years. 3(3-0) AST 458 or PHY 395 or approval of department.

The physics of radiation and the equation of its transfer. Theory of absorption coefficient and line absorption profile. The gray atmosphere and calculation of model atmospheres.

860. General Relativity and Cosmology I

Fall of even-numbered years. 3(3-0) PHY 858 or approval of department. Interdepartmental with and administered by the Department of Physics.

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.

861. General Relativity and Cosmology II

Winter of odd-numbered years. 3(3-0) PHY 860. Interdepartmental with and administered by the Department of Physics.

Relativistic cosmology: the model universes; stead-state theory; observational evidence and possibilities for decision among models; current problems.

984. Advanced Readings in Physics or Astronomy

Fall, Winter, Spring, Summer. Variable credit. Interdepartmental with and administered by the Department of Physics.

989. Waves and Radiations in Plasmas

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

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

AUDIOLOGY AND SPEECH SCIENCES ASC

College of Communication Arts and Sciences

(Name changed effective July 1, 1975. Formerly College of Communication Arts.)

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.

274. Structures and Functions of Speech and Hearing Mechanisms

Fall, Winter. 3(3-0) ASC 108 or approval of department.

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

276. Descriptive Phonetics

Winter, Spring. 3(3-0) ASC 274 or approval of department.

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

277. Scientific Bases of Voice Communication Process

Fall, Spring. 3(3-0) ASC 276 and PHY 237 or approval of department.

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

372. Speech Pathology I

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

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

373. Clinical Procedures in Speech Pathology and Audiology

Winter, Spring. 4(2-2) 2.00 grade-point average in ASC 277 and ASC 372 or approval of department.

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

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) ASC 276, ASC 277.

Fundamental aspects of normal hearing; hearing disorders, hearing tests.

460. Aural Rehabilitation

Winter, Summer. 5(4-1) ASC 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. 1 credit. May re-enroll for a maximum of 2 credits. Grade of 2.0 or better in both 372 and 373.

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 analysis; supervised clinical experience in language and speech evaluations 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.

490. Research Design in Audiology and Speech Sciences

Fall, Spring. 4(4-0) Self-paced. Senior majors or approval of department.

Sampling, measurement, experimental design, data collection, and quantitative procedures as applied to audiology and speech sciences. *Approved through Summer 1980.*

499. Independent Study

Fall, Winter, Spring, Summer. 1 to 6 credits. May reenroll for a maximum of 12 credits. Approval of department.

801. Advanced Study of Articulatory Behavior

Fall. 4(3-1) Approval of department.

Theoretical and pragmatic implications of the interrelationships of articulatory behavior and language production, especially as related to investigating procedures and results.

810. Audiologic Calibration Standards

Summer. 4(3-2) ASC 854 or ASC 833A and ASC 833B; ASC 880A; approval of department.

Contemporary electro-acoustic and other measurement standards for audiometers, sound level meters, earphones, hearing aids, and related devices; current issues in standards development; laboratory in applied measurement.

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 auiologist in relation to other disciplines in the rehabilitation of adults with voice disorders.

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)

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

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 studies of stuttering theories and the therapies accompanying them.

F. Cleft Palate

Summer. 4(3-1)

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

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 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

Spring. 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

Winter. 4(3-1)

Theory, administration and evaluation of selected tests including Bekesy, EDR, EEG, and advanced speech-audiometric tests.

E. Pediatric Audiology

Winter. 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.

853. Speech Perception: Theory and Measurement

Spring. 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.

854. Psychophysics and Theories of Audition

Winter. 4(4-0) Approval of instructor.

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 reenroll 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.

875A. Clinical Practicum in Speech and Language Pathology

Fall, Winter, Spring, Summer. 1 credit. ASC 474. May reenroll for a maximum of 8 credits.

Directed diagnostic, therapeutic, and prognostic experience in speech and language pathology.

875B. Clinical Practicum in Audiology

Fall, Winter, Spring, Summer. 1 credit. ASC 454. May reenroll for a maximum of 8 credits.

Directed diagnostic, therapeutic and prognostic experience in audiology in various clinical settings.

876. Communication Disorders: Neuroanatomy-Neurophysiology

Fall. 4(3-1) Approval of department.

Neuroanatomical and neurophysiological correlates of speech, language, and hearing.

880A. Algorithms for Speech and Hearing Sciences

Fall. 4(4-0)

A discussion of useful algorithms applicable to quantification of phenomena related to audiology and speech sciences.

880B. Acoustic Phonetics

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

An analytic study of the acoustics of speech.

880C. Instruments and Electronics for Audiology and Speech Sciences

Spring. 4(3-3) ASC 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

Summer. 4(4-0) ASC 880C or approval of department.

Critical review of the literature in experimental phonetics. Selected papers on acoustic and physiological phonetics and related fields are presented in seminar fashion.

899. Research

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

940. Seminar in Audiology and Speech Sciences

Spring, Summer. 4(2-0) May reenroll for a 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
College of Osteopathic Medicine

200. Introduction to Biochemistry

Winter, Summer. 5(5-0) Credit may not be earned in both BCH 200 and BCH 401. 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.

400H. Honors Work

Fall, Winter, Spring. Variable credit. Approval of department.

Assigned reading and experimentation.

401. Basic Biochemistry

Fall, Spring, 5(5-0) Credit may not be earned in both BCH 200 and BCH 401. One year organic chemistry or CEM 242; not open to biochemistry majors.

A one-term presentation of biochemistry emphasizing structure and function of major biomolecules, metabolism and regulation. Examples used for illustrative purposes will emphasize the mammalian organism.

404. General Biochemistry Laboratory

Winter, Spring. 3(1-6) Analytical chemistry; BCH 401 or BCH 451.

Experimental aspects of biochemistry.

412. Clinical Biochemistry

(363.) Winter, Summer. 4(2-3) BCH 401; CEM 162. Medical Technology majors. Not acceptable for a B S degree in biochemistry. Others: approval of department.

Quantitative clinical laboratory methods.

451. Biochemistry

Fall, 4(4-0) Credit may not be earned in both BCH 401 and BCH 451. One year organic chemistry or CEM 242.

A comprehensive presentation of biochemistry designed for undergraduate biochemistry majors, students of medicine, and other students desiring an intensive treatment of the subject.

452. Biochemistry

Winter. 4(4-0) BCH 451.

Continuation of BCH 451.

IDC. Biological Membranes

For course description see Interdisciplinary Courses.

499. Research

Fall, Winter, Spring, Summer. 1 to 4 credits. May reenroll 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.

501. Medical Biochemistry

Winter, Summer. 3(3-0) or 5(5-0) May enroll for a maximum of 5 credits in BCH 501 and BCH 502 combined. Winter: College of Human Medicine students; Summer: College of Osteopathic Medicine students.

Basic biochemical principles and terminology of importance in medical biology.