Hearing and Speech Sciences
Courses leading to the degrees of Doctor of Audiology, Doctor of Philosophy, Master of Education of the Deaf, and Master of Science in Speech-Language Pathology

**Audiology**

5121. General Anatomy. Introduction to the structure and function of the human organism. Integrates the gross anatomical structure of the human body and its organ systems with microscopic structure, physiological function, and homeostatic mechanisms. Emphasis also on the clinical relevance of selected topics. (Not currently offered)

5217. Hearing Disorders and Assessment. An introduction to the major pathologies of the peripheral and central auditory system as well as the medical/surgical treatment of those pathologies, followed by an introduction to the equipment and procedures used to assess auditory function in patients of all ages. [3] (Not currently offered)

5227. Anatomy and Physiology of Hearing Mechanisms. A comprehensive description of the anatomy and physiology of the peripheral and central auditory systems in normal and impaired populations. Includes a clinically-oriented review of neuroanatomy focused on the major sensory and motor pathways. Fall [3]

5302. Hearing Science. A discussion of basic acoustics as it applies to hearing science. Anatomy and physiology of the peripheral and central hearing mechanism and vestibular system. [3] (Not currently offered)


5310. Measurement of Hearing. The theory and practice of hearing measurement, with emphasis on routine clinical and screening audiometric techniques, testing environment, audiometric standards and calibration, applied impedance measurements, and interpretation of audiometric tests. Fall [3]

5325. Pediatric Audiology. A survey of methods and procedures used in the evaluation of the auditory function and management of neonates, infants, and young children. Includes identification and intervention procedures. There will be review of special populations of children with hearing loss. Fall [3]

5327. Hearing Loss and Speech Understanding. This course examines various factors that may affect the speech understanding of persons with hearing loss. The contribution to the unaided and aided speech understanding of persons with hearing loss of 1) subject factors, such as degree of hearing loss, and deficits in frequency and temporal resolution, and 2) environmental factors, such as, the level and type of background noise, reverberation and talker characteristics, will be examined. Methods for predicting speech understanding will also be discussed. Spring [3]


5330. Advanced Audiologic Evaluation I. Diagnostic audiometry principles and procedures, including acoustic reflex measures, speech audiometry, auditory brainstem response (ABR), and electrocochleography (ECochG). Also, newborn auditory screening with ABR. Practicum required. [3] (Not currently offered)

5332. Pathology of the Auditory System. A study of pathologies involving the peripheral auditory system arising from genetic factors, disease, and trauma, with emphasis applied to presenting signs/symptoms, and medical/audiological management. Fall [3]
5333. Microbiology and Pharmacology for Audiology. An examination of the microbial etiology and pathogenesis of acute otitis media and those microbial/host/environmental risk factors associated with infection, the primary mechanisms of antimicrobial resistance commonly encountered in middle ear infections and how this process impacts upon the therapeutic selection of an antimicrobial agent. The course will identify the potential role of biofilm formation in the middle ear as a potent virulence factor for recurrent disease. Spring [3]

5337. Auditory Clinical Electrophysiology. This course will cover basic concepts in electrophysiological and electromagnetic recordings (e.g. electrode types/uses, far and near field recordings, volume conduction, dipole sources). Recording of both near and far-field electrical responses emitted by peripheral and central nervous system will be studied. Recording techniques and interpretation of conventional clinical evoked potentials (e.g. electrocochleography, auditory brainstem response, sonomotor responses, electroneurography) will be covered. Special topics will include: audiometric applications of these evoked potentials (e.g. for infant hearing screening and special needs populations, and intraoperative neurophysiological monitoring). There will be extensive laboratory practica conducted within and outside the classroom. Spring [3]

5339. Amplification I - Lecture. Background and development of the design of hearing aids, ear mold acoustics, electroacoustic, characteristics, performance standards and measurement techniques, clinical selection and evaluation procedures. Spring [2]

5340. Amplification I - Laboratory. Laboratory that stresses instruction and practice in basic hearing aid techniques including Otoscopic examination, ear impressions, electroacoustic evaluation and probe microphone techniques. Summer [1]

5343. Hearing Conservation. A discussion of noise levels, OSHA guidelines, noise-induced hearing loss, and hearing protection in work and leisure activities. Industrial audiology including testing, training, and intervention protocols. Summer [2] (not currently offered)

5345. Amplification II. Advanced topics in amplification including advanced probe microphone techniques, single and multi-channel compression systems, analog and digital signal processing, and current and emerging prescriptive and fitting verification methods. Fall [3]

5346. Vestibular Sciences I. This course offers an in-depth approach to the basic assessment of the dizzy patient. Subject matter will include: where the vestibular system assessment falls in the audiology scope of practice, detailed anatomy and physiology of the peripheral and central vestibular, ocular motor, and postural control systems, bedside testing, introduction to both electrical and video techniques for recording the vestibulocular reflex; case history and bedside assessment of the dizzy patient, and, the technique and interpretation of video and electronystagmography. Students will be expected to conduct practica outside the classroom. Fall [3]

5347. Vestibular Sciences 2. Prerequisite is successful completion of Vestibular 1. This course will focus on the description of advanced assessment techniques including whole body, yaw axis sinusoidal harmonic acceleration testing and step testing, and, techniques for the assessment of the otolith system including on and off-axis centrifugation, and, both cervical and ocular vestibular evoked myogenic potentials. A module will be taught on the topic of peripheral and central disease and disorders affecting the vestibular system. Embedded in this module will be a section describing the multidimensional assessment of falls risk, disequilibrium of aging and the medical/surgical and non-medical management (i.e. vestibular rehabilitation) of vestibular system impairments. A final module will focus on how results of the vestibular test battery form predictable patterns. Students will be expected to conduct practica outside the classroom. Summer [3]

5349. Laboratory: Audiology in Education. Demonstration and hands-on experience with personal and classroom amplification systems. Operation and troubleshooting of amplification systems commonly used in a classroom setting. Specifically, hearing aids, FM systems, assistive listening devices, vibrotactile devices, and cochlear implants will be demonstrated. Co- or prerequisite: SPED 2600. Spring [1]

5350. Vestibular Sciences 3: Sensory & motor control of posture. This course will cover the neural mechanisms of postural control. Multisensory integration and biomechanics that contribute to static and dynamic posture will be explored. Normal and abnormal development, aging and learning will be presented. The effects of pathology on postural control will be discussed. Technology including computerized dynamic posturography will be used to
demonstrate concepts. Prerequisites are successful completion of Vestibular Sciences 1 and 2, or permission from instructor. Fall [3]

5353. Amplification III. Design and evaluation of auditory prostheses for listeners with hearing loss. Industrial audiology including testing, training, and intervention protocols. A discussion of noise levels, OSHA guidelines, noise-induced hearing loss, and hearing protection in work and leisure activities. Spring [3]


5355. Clinical Externship. Fall [3], Spring [3], Summer [1]

5359. Audiometric Instrumentation & Calibration. An introduction to fundamental concepts in electronics and computer science and to instrumentation used in the hearing clinic or research laboratory for producing, measuring, and analyzing audio signals. Standards and procedures for calibration measurements, with practical hands-on experience. Fall [3]

5361. Family-Centered Counseling and Interviewing. Examines the helping relationship in the clinical process, counseling theory relative to audiology and speech-language pathology practices, and principles and methods of effective clinical interviewing and counseling. Summer [2]

5362. Sign Language for Audiologists. This introductory course includes basic communication skills of American Sign Language (e.g., nonmanual markers, fingerspelling, numbers, basic vocabulary, classifiers, ASL linguistic structure), the sign system continuum, culture implications, and media resources available. Offered on request. Spring [2]

5363. Hearing and Aging. A survey of major concepts in gerontology, including demographics, psychosocial aspects of aging, biology of aging, and clinical conditions of the older adult. Physiological changes within the aging auditory system, and clinical issues in audiological assessment and intervention with older hearing impaired patients. Fall [3]

5365. Business and Financial Management. An overview of accounting practices, marketing, and operations management as they relate to management of an Audiology practice. Topics discussed include financial reporting, budgeting, pricing, billing & coding, regulatory issues and human resource management. Students are required to design an Audiology practice and develop a business plan as part of this course. Spring [3]

5367. Professional Issues & Ethics for Audiologists. Examines professional issues in Audiology including malpractice, quality improvement, marketing, credentialing, diversity, and legislation. Emphasis will be given to issues of ethics and clinical integrity in the practice of the profession of Audiology. Fall [2]


5580. Introduction to Clinical Case Conference. Fall [1]

5581. Capstone I. Capstone projects may take several forms including research-based investigations, evidence-based position papers, business plans, critical literature reviews with applications to clinical problem solving, grant proposals, development of clinical protocols based on published research findings, etc. In Capstone I, students will identify an appropriate capstone committee and define their capstone projects and submit and defend a Capstone Proposal. Spring, [3]

5582. Capstone II. In Capstone II, students will complete their Capstone Project. The Capstone project culminates in an oral defense of a formal manuscript which has been submitted to the students Capstone Committee. Fall [3]
5583. Practicum and Clinical Case Conference. This course includes attendance at weekly case conferences where clinical case studies will be presented. The grade for this class will include clinical performance and attendance. Fall, Spring [3]

5584. Capstone Research. Spring [0]

5586. Summer Practicum. This course covers clinical performance and attendance. Summer [2]

Education of the Deaf

5312. Psychology and Culture of the Deaf. Presentation and discussion of significant historical and current issues relating to the Deaf population. Primary focus will be on psychological development, educational/methodological models, and Deaf culture. Although the principle focus is on the psycho/social and cognitive/intellectual development of deaf individuals through the lifespan, a general survey of other areas of exceptionality is made with emphasis on the implications for the deaf child with additional disabilities and/or special needs. Spring [2]

5320. Introduction to Amplification for Infants and Children. Designed for deaf education and speech-language pathology students. Current issues and trends in conventional amplification for infants and children. Selection, fitting, verification, and validation of traditional amplification options will be addressed including directional vs. omnidirectional microphones, analogue vs. digital instruments, monaural vs. bilateral fittings, and real-ear measures vs. functional aided gain. Hearing aid retention, maintenance, and troubleshooting techniques are addressed. Fall [2]

5322. Children with Hearing Loss and Additional Disabilities. A survey of methods, procedures and observational techniques used in the identification and evaluation of children with physical, cognitive, and/or emotional disabilities. An interdisciplinary perspective informs the course with particular attention to identifying characteristics of special population that are atypical of children with hearing loss. Summer [3]


5356. Internship/Externship in MDE/Specialty Track. A three-week intensive, full-time clinical or classroom placement during the month of May in an auditory-oral environment designed specifically to meet the student’s individual interests and needs. Summer [2]

5358. Student Teaching and Field Experience in Deaf Education. Students will develop appropriate skills for providing services to children with hearing loss in group settings; will collaborate with professionals in audiology and speech/language pathology; will plan sessions for family-centered intervention emphasizing communication development or plan lessons; will prepare or review individual family service plans (IFSPs) or individual education plans (IEPs); will assess speech, language, listening, cognitive, motor and social development of children; and will evaluate effectiveness of services. Fall, Spring, Summer [1]

5370. Special Problems in Deaf Education. Areas and problems not included in other courses in deaf education, chosen to fit the students’ interests and the needs of their programs. May be repeated to a total of 12 hours. Fall, Spring, Summer [1-4]

5372. Seminar in Deaf Education. Supports student development of organizational skills that will facilitate the completion of requirements for the master’s degree in education of the deaf and the transition from graduate school to a profession in deaf education. Emphasis is placed on the development of a professional portfolio, a review of certification requirements, skill development in job searching including resume writing and interviewing skills. Spring [3]

5390. Curriculum and Methods for Deaf Children. Presentation and discussion of current issues, methods and materials involved in providing successful educational programming for children with hearing loss both in special programs and in inclusionary settings. This includes the adaptation of regular curriculum and instructional procedures for students with hearing impairments. Focus is on assessment of academic skills and individualizing instruction.

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Students gain practical experience in planning, carrying out and evaluating lessons and are exposed to a variety of educational materials and methods. Spring [3]

5392. Teaching Children with Hearing Loss to Listen & Speak – Early Childhood Development. Theories of and methods for developing auditory perception and spoken language skills in deaf and hard-of-hearing children. The purpose of this course is to increase students’ skills in assessing and developing speech, auditory functioning, and phonologic awareness in deaf and hard-of-hearing children. In the fall, the focus will be early childhood development. The spring semester will focus on assessment in early childhood and the summer semester will focus on intervention. Fall [2]

5393. Teaching Children with Hearing Loss to Listen & Speak – Assessment. Theories of and methods for developing auditory perception and spoken language skills in deaf and hard-of-hearing children. The purpose of this course is to increase students’ skills in assessing and developing speech, auditory functioning, and phonologic awareness in deaf and hard-of-hearing children. In the fall, the focus will be early childhood development. The spring semester will focus on assessment in early childhood and the summer semester will focus on intervention. Spring [2]

5394. Teaching Children with Hearing Loss to Listen & Speak – Intervention. Theories of and methods for developing auditory perception and spoken language skills in deaf and hard-of-hearing children. The purpose of this course is to increase students’ skills in assessing and developing speech, auditory functioning, and phonologic awareness in deaf and hard-of-hearing children. In the fall, the focus will be early childhood development. The spring semester will focus on assessment in early childhood and the summer semester will focus on intervention. Summer [1]

5585. Independent Study and Readings in Deaf Education. F, S, U [1-3]

Graduate School (Ph.D courses)

334. Seminar in Neurogenic Communication Disorders. Research literature on the relationship between brain and speech-language performance, emphasizing current methodology for studying neurological speech and language disorders. Prerequisite: 300 or 331 or consent of instructor. (Not currently offered)

341 Seminar in Audiology. Significant literature in the field of audiology. Directed study in assigned subject areas. Fall, Summer [2]

342. Seminar in the Neurobiology of Hearing and Multisensory Processes Study at the doctoral level of the neural processes underlying auditory and multisensory perception. The course will focus on critical readings of recently published findings that emphasize the connection between plasticity, neural systems and behavior. May be repeated for credit. Prerequisite: consent of instructor. FALL, SPRING [Variable credit: 1-2]

344. Administrative Issues in Communicative Disorders. A discussion of some of the important issues affecting the administration of programs in communication disorders. Emphasis on business management, marketing, financial management, third-party payors, grants and contracts, state and federal agencies, and fund raising. Summer of even-numbered years [2-3]

351. Special Problems in Speech Pathology. Areas and problems not included in other courses in speech pathology, chosen to fit the students' interests and the needs of their programs. May be repeated to a total of 12 hours. Fall, Spring, Summer [Variable credit: 1–6]

352. Special Problems in Audiology. Areas and problems not included in other courses in audiology, chosen to fit the students’ interests and the needs of their programs. May be repeated to a total of 12 hours. Fall, Spring, Summer [1–4]

371 A-B. Research Design and Statistics. Covers topics in research design and statistics for students preparing for research careers in hearing science, speech science, and communication disorders. Reviews mathematical bases for probability theory and statistical inference. Covers fundamental parametric and nonparametric statistical tests, with extensive discussion of research design in the context of analysis of variance. Presents statistical properties of psychophysical methods and signal detection theory. Fall [3], Spring [3]
373. **Signals and Systems for Hearing and Speech Sciences.** A hands-on laboratory course that concentrates on applications for communications science. The course covers: (1) the fundamentals of analog signals, including the Fourier transform and representation of signals in the time and frequency domains; (2) the fundamentals of analog systems (filters), including representation in the time and frequency domains and the analysis of signals that pass through systems; (3) an introduction to digital signals and digital systems, including digital filter design; and (4) an introduction to MATLAB, a powerful tool for understanding and implementing signals and systems. Summer (of odd-numbered years) [3]

375. **Seminar in Medical Audiology.** Advanced study at the doctoral level of the medical aspects of audiology and the relationship of audiology to otology and neuro-otology. May be repeated for credit. Prerequisite: consent of instructor. [Variable credit: 1–3] (Not currently offered)

5377. **Seminar in Speech Perception.** The study of the processes and models underlying the perception of speech features. Relevant acoustic correlates for speech perception will be evaluated, and these properties will be emphasized through the generation of synthetic speech. The course will cover the contributions of speech perception research to our understanding of speech development, and language and hearing disorders. Not currently offered.[3]

379. **Non-candidate Dissertation Research.**

380. **Advanced Seminar in Speech Language Pathology.** A doctoral-level course focusing on special topics of interest to faculty and students and based on recent research developments in speech pathology. May be repeated for credit. Prerequisite: consent of instructor. Fall, Spring, Summer [1-3]

381. **Advanced Seminar in Language.** A doctoral-level course focusing on special topics of interest to faculty and students and based on recent research developments in language. May be repeated for credit. Prerequisite: consent of instructor. Fall, Spring, Summer [3]

382a–382b. **Seminar: Research in Audiology.** An advanced study of research for the second-year doctoral student. Directed individual research culminating in oral presentation and a manuscript. Prerequisite: consent of instructor. [2–2] (Offered on demand)

383. **Advanced Seminar in Audiology.** A doctoral-level course focusing on special topics of interest to faculty and students based on recent research developments in audiology. May be repeated for credit (formerly HRSP 379). Prerequisite: consent of instructor. Fall, Spring, Summer [1-3]

384. **Instrumentation for Hearing and Speech Sciences: Stimulus Generation, Measurement, and Calibration.** A hands-on introduction to the principles and techniques of setting up equipment for hearing and speech perception experiments. Students are exposed to analog generators (noise generators, function generators, oscillators, computer-controlled digital-to-analog converters) processing devices (attenuators, filters, mixers, amplifiers), terminating devices (earphones, loudspeakers, analog-to-digital converters), and measurement devices (oscilloscope, voltmeter, spectrum analyzer). Students will learn to design and implement circuits involving these various devices, and to measure and calibrate various kinds of acoustic stimuli. Fall of odd numbered years. [3]

385. **Instrumentation for Hearing and Speech Sciences: MATLAB Programming with Real-Time Applications.** An introduction to the standard MATLAB computing language in a Windows environment. Basic programming concepts including data types and storage, data input and output, conditional execution, iterative programming, and the use of functions. The goal is for the student to become sufficiently comfortable with MATLAB (and with the concept of programming languages in general) to develop programs to solve specific computational problems too tedious to solve by calculator. The last third of the course will be devoted to the application of MATLAB programming to real-time laboratory problems... Spring of even-numbered years. [3]

386. **Spatial Hearing.** An advanced treatment of the perception by humans of auditory objects in space, including laboratory demonstrations. Topics include (1) binaural processing (lateralization, binaural detection); (2) localization and spatial resolution in the free-field; (3) auditory distance perception; (4) the precedence effect: localization in reverberant spaces; and (5) the central auditory nervous system: binaural pathways. Fall of even-numbered years. [3]. (Not currently offered)

388. **Independent Study and Readings in Speech Pathology.** Fall, Spring, Summer [1-3]
389. Independent Study and Readings in Audiology. Fall, Spring, Summer [1-3]

398  Preliminary Doctoral Research [0]

399  Ph.D. Dissertation Research [0]

3995  Half time Ph.D. Dissertation Research [0]
Speech Language Pathology

5206. Anatomy and Physiology of Speech and Hearing Mechanisms. The basic processes of speech production, acoustics, and perception. Neuroanatomy, anatomy, physiology, acoustics, and acoustic correlates of sound features. Intended for undergraduates and graduate students outside the Department of Hearing and Speech Sciences. Spring [3]

5300. Neurology of Speech and Language. The structure and function of the nervous system, with emphasis on the neural mechanisms of speech and language. Neurologic conditions producing speech and language disorders are surveyed. Fall [3]

5301. Acoustics and Perception of Speech and Speech Disorders. An examination of the processes of speech production, acoustics, and perception. Emphasis on relevant literature and research techniques in speech science. Fall [3]

5304 Child Language Acquisition. The components and processes of normal language development. Relations between language acquisition and social and cognitive aspects of child development as well as literacy development. Survey of developmental psycholinguistic research. This course is course is appropriate for graduate students with or without previous coursework in language development. Fall [3]


5306. Child Language Disorders. The language development of children of variant populations. Focus on description of populations, assessment techniques, and intervention strategies. Clinical applications of research in normal language acquisition. Fall [3]


5311. Stuttering. Significant research in the field of stuttering, with emphasis on etiology and therapy. The management of fluency disturbances. Spring [3]

5313. Management of Communication Disorders in the Schools. This course provides an overview of management principles and practices for children with communication disorders during the school-age years. Curriculum-based communication assessment and methodologies for implementation of communication programs in school settings will be addressed. Spring [3]

5314. Articulation Disorders and Clinical Phonetics. The etiology, evaluation, and management of articulatory defects in children and adults. Prerequisite: consent of instructor. Fall [3]


5317. Traumatic Brain Injury. Pathophysiology of traumatic brain injury in children and adults; unique and common sequelae, the evaluation and treatment of cognitive/communicative deficits and special problems of the population. Prerequisite 5300, 5331 or consent of instructor. Summer [3]

5319. Dysphagia. The study of the normal and disordered swallow in pediatric and adult populations. Anatomy and physiology, videofluoroscopic and other assessment procedures, various treatment alternatives and techniques in adult populations are included; as well as assessment, diagnosis, and management of dysphagia in children; including, multidisciplinary and family centered, family supported management. Fall [4]


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5323. Communication in Autism Spectrum Disorders. The course addresses basic theories and principles associated with communication assessment of and intervention for children with Autism Spectrum Disorders. Auditory characteristics, causitive factors, classroom structure, behavior management, communication strategies, social and peer interaction, and family-focused practices are also reviewed. This class also will provide an overview of typical social, play, and linguistic development compared to the features and behavioral characteristics of autism spectrum disorders (ASD). Fall [3]

5326. Speech Disorders in Craniofacial Anomalies. The etiology, diagnosis, and management of speech defects associated with craniofacial anomalies, with major emphasis on cleft palate. Summer [1]

5331. Aphasia. The study of aphasia in adults, including the neuronanatomical basis, etiologies, symptomatology, assessment, differential diagnosis, and treatment. Spring [3]

5335. Augmentative and Alternative Communication. The theory, rationale, and methods for use of augmentative and alternative communication (AAC) systems with patients who have physical, intellectual, and/or cognitive disabilities. Students will be exposed to various low- and high-technology AAC systems and learn how and when to apply each in the treatment of patients with complex communication needs (CCN). Fall [2]

5336. Voice Disorders. Theories of voice production, with emphasis upon underlying mechanisms that cause vocal defects. Procedures for group and individual management. Summer [2]

5338. Research Methods in Communicative Disorders. Research techniques and procedures. Analysis of research examples from the literature. Study of design of experiment, data collection, statistical analysis, and presentation of research findings. Fall [1]

5348. Audiology in Education. Current issues and trends concerning the role of the audiologist in the public school setting. Emphasis on early identification and intervention, inservice education, amplification, and the roles of federal, state, and local agencies in providing services to the hearing-impaired school-age population. Fall [3]

5355. Clinical Internship/Externship. Sequence of clinical practicum placements over five semesters for speech-language pathology majors in clinical track. Designed to meet supervised-practicum requirements for eventual certification by American Speech-Language-Hearing Association. Sequence of initial part-time internship placements in campus and other local facilities, followed by a full-time externship placement at one of many selected sites throughout the country or abroad. Spring, Summer [6]

5357. Professional Issues in Communication Disorders. Examines various professional issues within the fields of speech-language pathology and audiology. For example, ethics, malpractice, quality improvement, marketing, reimbursement, multicultural sensitivity, and federal legislation. Spring [1]

5361. Family-Centered Counseling and Interviewing. Examines the helping relationship in the clinical process, counseling theory relative to audiology and speech-language pathology practices, and principles and methods of effective clinical interviewing and counseling. Spring [1]

5369. Master's Thesis Research. Fall, Spring, Summer [0]

5388. Independent Study/Readings in Speech Pathology. Fall, Spring, Summer [1-3]

5583. Practicum and Clinical Case Conference. This course includes attendance at weekly case conferences where clinical case studies will be presented. The grade for this class will include clinical performance and attendance. Fall, Spring, Summer [1]

5584. Independent Practicum. Fall, Spring, Summer [0]