

# INDIANA UNIVERSITY

University Graduate School  
2006-2007  
Academic Bulletin

## Speech and Hearing Sciences

College of Arts and Sciences  
Bloomington

Chairperson  
Professor Karen Forrest\*

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### Graduate Faculty

(An asterisk [\*] denotes membership in the University Graduate School faculty with the endorsement to direct doctoral dissertations.)

#### Professors

Jean Anderson\* (Emerita), Moya L. Andrews\* (Emerita), Phil J. Connell\*, Mary Elbert\* (Emerita), Aubrey Epstein\* (Emeritus), Karen Michele Forrest\*, Judith A. Gierut\*, Nicholas Hipskind\* (Emeritus), Larry E. Humes\*, Diane Kewley-Port\*, Robert Milisen\* (Emeritus), Kennon Shank\* (Emeritus), Charles Watson\* (Emeritus)

#### Associate Professors

Raquel Teresa Anderson\*, Lisa Gershkoff-Stowe, Laura L. Murray\*, William Shofner

#### Assistant Professors

Julie D. Anderson, Theresa Burnett, Rachel Holt, Jennifer J. Lentz, Julien Musolino, Robert Withnell

#### Associate Scientist

Gary Kidd\*

#### Adjunct Professors

Daniel Dinnsen\* (Linguistics), Steven Franks\* (Linguistics), Charles Schmidt\* (Music)

#### Graduate Advisors

Master's Program: Speech-Language Pathology: Associate Professor Laura Murray\*, Speech and Hearing Center C183, (812) 855-3585; Au.D. Program: Assistant Professor Robert Withnell, Speech and Hearing Center C153, (812) 855-9339; Ph.D. Program: Dr. Gary Kidd\*, Speech and Hearing Center C136, (812) 855-8105.

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## Degrees Offered

Master of Arts and Doctor of Philosophy. In addition, the College of Arts and Sciences offers the Doctor of Audiology degree.

## Areas of Specialization

Speech, language, and hearing sciences, speech-language pathology, audiology. Specific course requirements for these specializations are listed in the *Student Handbook* available in the departmental office, Speech and Hearing Center C100.

## Special Departmental Requirements

(See also general University Graduate School requirements.)

### Admission Requirements

Undergraduate major in speech and hearing sciences or other evidence of adequate background for one or more areas of specialization. Deficiencies may be removed by course work or special examination. Graduate Record Examination General Test required.

### Grades

All graduate students must maintain at least a 3.0 (B) grade point average. Failure to do so for two semesters may result in dismissal from the program.

## Master of Arts Degree

### Course Requirements

A minimum of 36 credit hours, of which 15 must be in courses numbered 500 and above; maximum of 6 credit hours in S780.

### Minor

Students who wish to earn the M.A. degree and who do not choose to write a thesis are required to complete at least 6 credit hours of course work in a minor area. Such courses must be selected in consultation with a sponsoring faculty member and must be approved by the faculty before the student's enrollment in them. The courses should focus on a single content area, enhance the student's professional preparation, and lie beyond the scope or level of courses specifically required for the M.A. degree. Courses taken in fulfillment of the minor area requirement must be passed with at least a grade of B.

### Practicum Requirements

For students who wish to obtain clinical certification, satisfactory clinical performance is an integral part of the M.A. program. Such students must be registered in a practicum (S561, S570, S563, or school practicum) each semester following the completion of S461. Such students must also complete at least three semesters of practicum with grades of B (3.0) or higher in order for the department to approve the student's application for certification as a speech-language pathologist with the American Speech-Language-Hearing Association. Students should contact Dr. Elizabeth McCrea for all matters related to clinical certification by the national association.

### Thesis Requirement

Students who want the M.A. in speech and hearing sciences must present a thesis or complete a minor as described above. Procedures to be followed when writing a thesis can be found in the department's *Master's Student Handbook*.

### Comprehensive Examination Requirement

A written comprehensive examination is required of all M.A. students.

### **Nonclinical M.A. Requirements**

Students who wish to earn the M.A. degree but do not choose to complete practicum requirements and clinical certification may complete a nonclinical M.A. degree. Course, minor, thesis, and final examination requirements are the same as those specified above.

### **Doctor of Audiology (Au.D.) Degree**

This degree requires a minimum of 90 credit hours, including those earned toward a Master's degree. The Au.D. degree program is offered through the College of Arts and Sciences.

### **Doctor of Philosophy Degree**

#### **Course Requirements**

At least 90 credit hours, including advanced (post baccalaureate) course work and dissertation. A student must select, in consultation with the advisor, one major area in the department and at least one minor area outside the department. Requirements and examination procedures for the outside minor are determined by the appropriate representative of the minor department or program.

#### **Other Requirements**

Any student admitted to the doctoral program must complete a first-year, second-year, and dissertation research project. See the department's *Doctoral Student Handbook* for procedural details; in no way, however, does this handbook substitute for the *University Graduate School Bulletin*.

#### **Research-Skill Requirement**

Candidates must demonstrate proficiency in a research skill before being admitted to candidacy. Each course must be passed with a grade of B (3.0) or higher to satisfy the proficiency requirement. The student's academic program must include a minimum of 6 credit hours in experimental design and statistics (500 level or above) or the equivalent. No more than 12 credit hours of the course work taken to satisfy this requirement may count as part of the 90 credit hour minimum required for degree completion.

#### **Grades**

No course with a grade below B (3.0) may be counted toward degree requirements.

#### **Advisory Committee**

Each student will be assigned an advisory committee consisting of four members. The majority of the members must be on the graduate faculty. The advisory committee shall approve the student's program of study and advise the student until successful completion of the qualifying examination.

#### **Qualifying Examination**

Guidelines suggest that the student must complete successfully a series of written exams ranging from a conventional timed examination to a research paper composed over a period of several weeks.

Examination in the outside minor area is at the discretion of the minor-field representative. Information about specific examination formats is available in the *Doctoral Student Handbook*.

The advisory committee, in conference with the student, will determine for whom the student will write and the exam format. Persons preparing questions will read the answers and pass or fail the student. Students will be informed of the results in writing by the chairperson of the advisory committee within three weeks. Procedures for rewriting a part or all of the qualifying examination are left to the discretion of the advisory committee. Qualifying examinations may be rewritten once only. Oral examination is also required.

#### **Ph.D. Minor in Speech and Hearing Sciences**

Students wishing to obtain a minor in speech and hearing sciences must have an advisor from the department. The advisor will approve the student's program of course work in the minor and will serve on the student's advisory committee, research committee, or both. The student is required to complete at least 12 credit hours of graduate course work in the minor department with a grade of B or higher. A

written qualifying examination is not required, but will be administered at the request of the major department.

## Courses

### General

**S680 Independent Study (1-6 cr.)\*\***

**S780 M.A. Thesis (1-6 cr.)\*\***

**S880 Ph.D. Thesis (1-6 cr.)\*\***

\*\*These courses are eligible for a deferred grade.

### American Sign Language

**A500 ASL Level One for Graduate Students (3 cr.)** Introductory sign language for graduate students with no previous experience. Builds a good basic vocabulary of signs, teaches finger spelling, introduces basic aspects of grammar and the proper use of facial expression in sign language conversation. Students are also exposed to deaf culture.

**A550 ASL Level Two for Graduate Students (3 cr.)** P: A500. Continues building receptive and expressive abilities. Puts emphasis on the use of signing space, facial grammar, body postures, fluent finger spelling, and continued vocabulary development. More complex grammatical structures are introduced. Deaf culture component included.

**A600 ASL Level Three for Graduate Students (2 cr.)** Emphasizes the development on conversational ability. Examines more complex grammatical structures, with emphasis on ability to use these structures in conversation. Readings, videos, and discussion cover characteristics of the deaf population and their cultural values.

**A700 ASL Level Four for Graduate Students (2 cr.)** P: A600. Continues to develop knowledge of American Sign Language and deaf culture. Students will experience the language outside the classroom through interaction with the deaf community.

### Speech and Hearing Sciences

**S461 Introduction to Supervised Clinical Practice (2 cr.)**

**S474 Introduction to Audiological Testing (3 cr.)**

**S475 Advanced Audiological Testing (3 cr.)**

**S477 Auditory Disorders (3 cr.)**

**S478 Rehabilitative Audiology (3 cr.)**

**S501 Neural Bases of Speech and Language (3 cr.)** Neuroanatomy of central and peripheral brain structures mapped to vocal tract structures; sensory and motor physiology; theories of motor control; neural control of vocalization and upper airway during propositional and nonpropositional speech; localization of receptive and expressive language brain areas, neuropathology and pathophysiology of central and peripheral nervous system lesions.

**S502 Acoustic Phonetics (2 cr.)** P: S302 or L541. Examines speech perception and the acoustics of speech production in normally developing or speech-language disordered populations. A brief overview of speech acoustics and speech perception in normal adults will be included. Laboratory experiences.

**S505 Clinical Application of Linguistic Theory (4 cr.)** Application of models of language structure and use of the clinical process of diagnosis, evaluation, and treatment of phonological, lexical, morphological, and syntactic impairments of language acquisition.

**S506 Counseling (2 cr.)** Provides information about the counseling purview of audiologists and speech pathologists. Topics such as theories of counseling, lifespan issues, emotional responses to communication disorders, family dynamics, support groups, and multicultural issues will be presented. Students will learn basic counseling techniques and the application of these techniques for specific disorders.

**S508 Physiological Models for Perception and Production of Speech and Voice (3 cr.)** Provides students with understanding of the physiological bases for production and perception of speech and voice in humans. Covers the dynamic functioning of structures of the organs of speech production and perception, and the relations of their parts. This knowledge will form the basis for subsequent understanding of disorders of speech production and perception.

**S509 Speech and Language Diagnostics (2 cr.)** Theoretical bases of speech-language assessment, including concepts of testing and measurement, formal and informal evaluation techniques, and normative and nonnormative approaches. Required accompanying laboratory provides observation and experience with specific assessment procedures.

**S510 Supervision in Speech Pathology and Audiology (2 cr.)** P: Consent of instructor. Study of the supervisory process as it relates to speech pathology and audiology.

**S511 Phonetics of American Speech (2 cr.)** Scientific study of American pronunciation based on International Phonetic Alphabet. Exercises in transcription.

**S512 Cognitive and Social Factors Related to Communication Disorders (3 cr.)** Examines the manner in which language influences and is influenced by cognitive processes including attention, categorization, information processing and retrieval, and short and long-term memory. In addition, the course will explore how social factors such as age, gender, ethnicity, and culture interact with language form and use.

**S515 Topical Seminar in Speech Pathology or Audiology (1-6 cr.)** Topics of current interest; literature on fundamental behavior related to speech or hearing.

**S518 Preschool Language Intervention: Working with Teachers and Parents (2 cr.)** An overview of current clinical research on preschool classroom and home-based intervention. Reviews preschool language development and introduces students to developmentally appropriate classroom-based and home-based intervention procedures. Participants will review and discuss current research and its relationship to children's language intervention plans.

**S519 Mathematical Foundation for Speech and Hearing Sciences (2-3 cr.)** Provides mathematical background for core graduate courses in speech and hearing sciences. Covers analysis and generation of periodic and aperiodic acoustic signals and decision theory. Focuses on interactive, project-oriented modules.

**S520 Phonological Treatment (3 cr.)** P: S420. Survey of evidence-based practices in treatment of children with phonological disorders. Advanced approaches to clinical management using principles of single-subject design to improve efficiency.

**S521 Phonological Acquisitions and Disorders in Children (2 cr.)** Survey of acquisition and development of sound systems, with focus on perception and production. Relationship between normal sound development and phonological disorders. Procedures for assessing and treating phonological disorders.

**S522 Digital Signal Processing (3 cr.)** P: One semester of calculus, one course in computer programming. Introduction to digital signal processing for students with a limited background in mathematics. Examines several standard applications in speech processing including LPC. Covers complex numbers, z-transforms, and filter design. Lab experiences with DSP software included.

**S524 Survey of Children's Language Development (2 cr.)** Theories and research relating to normal development of phonology, syntax, semantics, and pragmatics in children from birth through age four. Investigation of cognition and various environmental factors as contributors to language development. Emphasizes learning of elementary skills in language sample analysis.

**S525 Childhood Dysarthria and Apraxia of Speech (3 cr.)** The aim of this course is to introduce students to the basic correlates of children's motor speech disorders including issues of underlying pathology, physiological development, assessment procedures, and treatment alternatives.

**S531 Traumatic Brain Injury (3 cr.)** Disorders of perception, cognition, communication, and behavior associated with traumatic brain injury in children and adults are described. Discussion includes assessment and treatment procedures and issues associated with acute and chronic stages of recovery as well as a variety of clinical settings, including schools, hospitals, and community reintegration facilities.

**S532 Early Communicative Development: Intervention Issues (3 cr.)** Provides basic information concerning infant and toddler communicative development, conditions which place infants at risk for speech and language disorders, and assessment and intervention procedures within various models of service delivery.

**S534 Language Development in School-Age Children (3 cr.)** R: S333. Survey of theoretical perspectives and research findings related to language development in children aged five through twelve. Particular attention to relationships between oral language skills, reading, and writing. Consideration of language and context, including differences between language demands of home and school.

**S535 Academically Based Language Intervention with School-Age Children (3 cr.)** P: S534. R: At least one semester of S561. Explores issues involved in an academically based language intervention program with a focus on the child's need to use language to learn and to develop literacy. Setting goals for intervention and developing intervention plans will be discussed in the context of a collaborative model using a curriculum-based approach.

**S536 Language Diversity and Clinical Practice (3 cr.)** Examines the effects on current clinical practice in speech-language pathology of the linked issues of racial, cultural, and linguistic diversity. Both assessment and intervention issues will be considered.

**S537 Diagnosis and Management of Adult Aphasia (3 cr.)** P: S501. In-depth study of diagnosis and management of adult aphasia and related disorders. Recommended procedures for evaluation and treatment of aphasics, including practicum and experience.

**S538 Language Development in Atypical Populations: Learning Disabilities, Autism, and Mental Retardation (3 cr.)** P: S333 and S436 or consent of instructor. An introduction to three clinical populations likely to have difficulties with language learning. Aspects of perceptual, cognitive, and social growth as they influence language acquisition; patterns of language development and use; issues related to intervention.

**S539 Second-Language Acquisition and Bilingualism in Children (3 cr.)** Focuses on how children acquire two languages. Topics concerning variables that impact dual-language acquisition children and patterns of acquisition will be discussed. Issues and strategies for evaluating language skills in this population, and for providing clinical services are presented.

**S540 Voice Disorders (3 cr.)** P: S444 or consent of instructor. Normal and abnormal voice production; diagnosis and management of voice problems. Emphasis will be on clinical intervention strategies for a wide variety of organic and functional voice disorders.

**S541 Management of Tracheostomy and Laryngectomy (3 cr.)** Aerodigestive tract dynamics and disorders, including assessment and treatment. Rehabilitation options associated with tracheostomy, laryngectomy, and dysphagia.

**S542 Care of the Professional Voice (3 cr.)** Physiological, psychosocial, and occupational aspects of professional voice use. A multidisciplinary perspective on research and practice in the areas of otolaryngology, social psychology, vocal pedagogy, voice science, and communication disorders. Examines historical and current approaches to preventing, assessing, and treating voice breakdown in singers and other professional voice users.

**S543 General Methods of Speech Analysis (2 cr.)** Provides a theoretical and practical background for the use of different analysis techniques. Additionally, computer-based analysis of voice, respiration, and articulation will be introduced and their application in biofeedback will be examined.

**S544 Dysphagia: Diagnosis and Treatment of Swallowing Disorders (2 cr.)** Anatomy and physiology of adult and child swallowing and respiration is reviewed. Evaluation and treatment of adult and child dysphagia emphasizing instrumental and noninstrumental assessment procedures and the development of efficacious treatment plans. Experience in analysis of adult videofluoroscopic studies of swallowing.

**S545 Adult Cognitive-Communication Disorders (3 cr.)** Issues in communication and cognitive disorders resulting from right-hemisphere brain damage and dementia. Discussion will include the relation between the nature and locus of brain lesion and the type and severity of communication and cognitive disorders, and assessment and treatment issues.

**S547 Language Disorders in Children (2 cr.)** Theory and method in language assessment and intervention. Coverage of principles of language intervention based on psycholinguistic theory and research with language-disordered children, design and execution of language intervention experiences; current alternative approaches to language intervention.

**S548 Voice and Fluency in Children (2 cr.)** Survey of theory and research relevant to the maturation of vocal behavior and prosodic patterns (including rate and fluency) from infancy through adolescence. Identification of characteristics of typical and atypical vocal behavior in interpersonal interactions. Observation and analysis of characteristics and discussion of types of intervention.

**S550 Stuttering (3 cr.)** P: S444. Theories of the nature and causes of stuttering, with emphasis on learning theories and physiological processes; evaluation techniques for children and adults; approaches to clinical management; techniques of parent and family counseling.

**S555 Motor Speech Disorders (3 cr.)** P: S201, S501. Disorders of speech motor programming (dyspraxia) and speech production (dysarthria) resulting from damage to primary motor, sensory, or sensorimotor pathways in the central and/or peripheral nervous system are considered at auditory-perceptual, acoustic, and physiologic levels. Assessment and management of motor speech disorders.

**S560 Craniofacial Anomalies (3 cr.)** P: S201. Orofacial clefts and other genetically based craniofacial disorders are considered in relation to speech production and swallowing. Assessment protocols include auditory-perceptual evaluation, vocal tract imaging (nasendoscopy and fluoroscopy), and speech aerodynamics. Introduction to therapy procedures.

**S561 Topical Issues in Clinical Practice (1-3 cr.; max. 4 cr. toward degree)** Current topics related to clinical practice in speech/language pathology.

**S562 Practicum in Supervision (1 cr.)** P: S510, S561. Practicum in the supervision of clinical practice in speech-language pathology and audiology.

**S563 Externship in Speech-Language-Hearing Services (1-3 cr.)** P: S561 or S570. Intensive participation in the clinical activities of community agencies, hospitals, or other service providers. Available only to advanced students in clinical program.

**S570 Clinical Practicum in Audiology I (1-3 cr.)** Supervised on-site clinical work in diagnostic and rehabilitative clinical audiology. Intended for students in the first year of the Au.D. program.

**S571 Auditory Anatomy and Physiology (3 cr.)** Structure and function of the mammalian auditory system, including aspects of both cellular and systems physiology.

**S572 Clinical Electrophysiology (2 cr.)** Focuses on current applications of electrophysiologic testing, including auditory evoked potentials, otoacoustic emissions, and electronystagmography. Will address role of each of these test procedures in the diagnostic audiologic test battery.

**S574 Clinical Grand Rounds in Audiology (2-3 cr.)** P: Consent of instructor. Survey of the clinical aspects of audiology pertaining to pathologies encountered in clinical environments with emphasis on specific etiologies.

**S575 Human Hearing and Communication (2 cr.)** Development of the auditory system and landmarks of auditory behavior, types of hearing loss, intake and exit interviewing techniques, audiometric standards, pure tone audiometry, acoustics impedance measurements, screening for auditory disorders and speech audiometry, effect of age and aging on oral communication, counseling the hearing impaired, strategies in selecting hearing aids, recommending auditory training, speech reading, and manual communication.

**S576 Amplification for the Hearing Impaired (3 cr.)** Types and components of electroacoustic hearing aids, earmold acoustics, and procedures for the selection, evaluation, and fitting of hearing aids.

**S577 Industrial Audiology (2 cr.)** P: Consent of instructor. The role of audiology, emphasizing identification audiometry, damage-risk criteria, measurement and control of noise, conservation procedures, and medico-legal problems.

**S578 Audiological Instrumentation and Calibration (3 cr.)** Fundamentals of acoustics and acoustical measurements including waveform measurements, spectral analysis, and noise analysis. Calibration techniques and standards for clinical audiology are also reviewed.

**S579 Children with Hearing Loss (3 cr.)** P: Consent of instructor. Introduction to the assessment of communication skills in children with hearing loss. Topics covered include early identification of hearing loss, assessment of hearing in very young children, speech and language development in children with hearing loss, and management strategies for hearing-impaired children.

**S580 Introduction to Research in Communication Disorders (3 cr.)** Treatment decisions in speech/language pathology must be: 1) based on ethical principles, 2) made responsibly in line with the existing evidence in the literature, and 3) presented in a professional manner. Introduces students to the evaluation of literature that will help them make responsible decisions about assessments and treatments. Provides them with the tools to determine the importance and/or validity of procedures that are used.

**S601 Experimental Phonetics II (3 cr.)** P: Consent of instructor. Speech acoustics. Examination of theories of vocal-tract transmission through a historical perspective. Consideration of literature in acoustic phonetics, with emphasis on research that models speech acoustics relative to articulatory configuration. Laboratory experiences.

**S670 Clinical Practicum in Audiology II (1-3 cr.)** Supervised on-site clinical work in diagnostic and rehabilitative clinical audiology. Intended for students in the second year of the Au.D. program.

**S672 Clinical Externship in Audiology I (1-3 cr.)** Supervised off-site clinical work in diagnostic and rehabilitative clinical audiology. Intended for students in the second year of the Au.D. program.

**S673 Clinical Externship in Audiology II (1-5 cr.)** Supervised off-site clinical work in diagnostic and rehabilitative clinical audiology. Intended for students in the third year of the Au.D. program.



**S674 Advanced Seminar in Audiology (1-3 cr.)** Intended for Ph.D. students. Various topics in clinical and experimental aspects of audiology. Content varies each semester.

**S676 Advanced Clinical Concepts in Amplification (3 cr.)** This seminar presents advanced material on conventional amplification, assistive listening devices, and classroom amplification systems. Students will develop models for selection, fitting, evaluation, and management of devices for patients with hearing loss. This includes integrating research content into clinical activities leading to appropriate, defensible rationales for a comprehensive hearing program.

**S678 Introduction to Psychoacoustics (3 cr.)** Perception of sound by normal and hearing-impaired listeners. Topics covered include masking, pitch, loudness, and other auditory phenomena.

**S683 Research Forum in Speech, Language, and Hearing Sciences (0-1 cr.)** Research presentations by students, faculty in the Department of Speech and Hearing Sciences, and guest speakers. Normally taken each semester by students in speech and hearing sciences without credit, but may be taken once for 1 credit hour.

**S685 Research in Speech, Language, and Hearing Sciences (3 cr.)** Selected topics in research design, analysis, and reporting (articles and talks); ethics; and preparation of grant proposals, as appropriate to speech, language and hearing sciences, and disorders.

**S686 Physiological Research in Speech, Language, and Hearing Sciences (3 cr.)** Course topics vary according to student interests, including: neuroscience research in speech, language, cognition, and hearing; imaging; videostroboscopy; and motor control. Lab components to include instrumentation for EMG, biomechanics, and evoked potentials.

**S696 Language Research in Speech, Language, and Hearing Sciences (3 cr.)** Topics vary according to student interests, including advances in linguistic theory, language and phonological acquisition theory, neurolinguistics, language intervention, etiological research, cognition and language (including memory and attention), and reading and language. Lab components include computer software for both linguistic analyses and experimental presentation.

**S702 Acoustic Research in Speech, Language, and Hearing Sciences (3 cr.)** Course topics vary according to student interests including speech production and perception in hearing impaired populations, language development, adult neurogenic speech and language disorders, voice analysis, and speech perception. Lab components to include digital recording, acoustic analysis, and speech synthesis.