PACS Bulletin 2014-2015

Program in Audiology and Communication Sciences
Washington University School of Medicine

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The mission of the Program in Audiology and Communication Sciences (PACS) is to serve as a center of excellence in audiology, deaf education, and speech and hearing sciences. This will be accomplished by:

• delivering exemplary educational programs;
• fostering a community of support; and
• maintaining high expectations for professionalism, leadership and service.

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The Program in Audiology and Communication Sciences (PACS) at Washington University School of Medicine offers exceptional graduate education in one of the world’s leading centers for education, clinical care and research in hearing disorders.

**Degrees Offered**

- **Doctor of Audiology (AuD):** prepares students for a career as clinical audiologists
- **Master of Science in Deaf Education (MSDE):** prepares students as teachers of children who are deaf or hard of hearing
- **Doctor of Philosophy (PhD):** prepares students for academic and research careers in speech and hearing sciences

We invite you to become a part of our extraordinary community of educators, scholars and clinicians.

**What is PACS?**

PACS offers graduate education programs in audiology, deaf education, and speech and hearing sciences. PACS is a member of a consortium of programs known as CID at Washington University School of Medicine. The consortium also includes hearing research programs and adult audiology clinics.
Our graduate programs are among the oldest and most respected of their kind. Our experience and comprehensive learning opportunities produce graduates fully prepared to reach their professional goals.

Our programs combine the individualized attention of a supportive faculty with the resources of a world-class academic medical center. Washington University’s internationally recognized hearing sciences research enterprise, its outstanding audiology clinics, and the world-renowned CID School for children who are deaf or hard of hearing are all on campus and serve as the sites of learning for our students.

As participants in this rich environment, students gain a breadth and depth of experience that is virtually unparalleled.
The Doctor of Audiology (AuD) program is a four-year course of study that prepares students as independent clinical audiologists. Established in 1947, the program is among the oldest and most prestigious of its kind. Today, its curriculum serves as a national model, immersing students in academic coursework, clinical experiences and research opportunities. Ranked among the top three in the country by U.S. News & World Report, the program and its faculty are internationally recognized and the program attracts a diverse body of students.

Curriculum
During the first three years, coursework is integrated with clinical and research training, with students completing a Capstone Project in the third year of study. The fourth year is fully dedicated to clinical training. A variety of formative and summative assessments are required during the four-year program to ensure each student’s acquisition of knowledge and mastery of skills. The curriculum covers the scope of practice, and includes coursework in the basic and applied sciences, as well as prevention, identification, evaluation and treatment of auditory and vestibular disorders.

Clinical Experiences
Clinical experiences begin in the first semester and become more prominent with each successive semester, culminating in a full-time clinical externship in the fourth year. Approximately 40 sites in the St. Louis area and 75 more sites around the country are affiliated with the AuD program. They provide clinical experiences across the lifespan and scope of practice, including comprehensive audiologic evaluations, hearing aids, cochlear implants, aural rehabilitation, vestibular evaluation and treatment, electrophysiology and much more. In addition, our world-class medical school and hospitals provide students with unique opportunities such as attending Grand Rounds, observing cochlear implant surgeries and participating in optional research training programs.

Research
The integration of research into the curriculum is a distinctive feature of the program. All students receive research training through coursework and the completion of the Capstone Project in the third year. Interested students are also encouraged to pursue their individual research interests through a variety of elective, interdisciplinary research opportunities.

Accreditation and Certification
The AuD program is accredited by the Accreditation Commission for Audiology Education (ACAE), 1718 M Street NW, #297, Washington, DC, 20036, and the Council on Academic Accreditation in Audiology and Speech-Language Pathology of the American Speech-Language-Hearing Association (ASHA), 2200 Research Blvd. #310, Rockville, MD 20850, (800) 498-2071 or (301) 296-5700.

Graduates will meet the academic, clinical and research requirements for the Certificate of Clinical Competence (CCC) of ASHA.

The Field of Audiology
Audiology is the science of hearing and the study of auditory and vestibular processes. Audiologists work with all ages, from infants to the elderly, in clinical settings such as hospitals, schools and clinics, and in government and industry. They measure hearing ability, identify hearing and balance disorders, provide rehabilitative services and speechreading training, assist in differential diagnosis of sensory and neurological disorders, and assess the need for amplification devices.
Doctor of Audiology (AuD) Curriculum

YEAR ONE

Fall Semester
401 Anatomy and Physiology of Speech and Hearing
421 Introduction to Electroacoustics
434 Typical Language Development*
460 Observation and Practicum in Audiology
5601 Clinical Audiology I
565 Hearing Devices I

Spring Semester
460 Observation and Practicum in Audiology
505 Auditory Neuroscience
510 Auditory Perception
543 Survey of Speech and Language Disorders*
551 Research Seminar
5602 Clinical Audiology II
5652 Hearing Devices II

Summer Semester
4610 Practicum in Audiology
569 Hearing Disorders

YEAR TWO

Fall Semester
4301 Sign Language I*
4611 Practicum in Audiology
468 Pediatric Audiology
5001 Electrophysiologic Techniques I
5653 Hearing Devices III

Spring Semester
4612 Practicum in Audiology
5002 Electrophysiologic Techniques II
502 Pharmacology
507 Vestibular Assessment
574 Statistics and Research Methods

YEAR THREE

Fall Semester
4614 Practicum in Audiology
466 Rehabilitative Audiology
470 Business Practices
506 Genetics in Hearing Loss
5700 Capstone Project

Spring Semester
4615 Practicum in Audiology
511 Hearing Conservation
5700 Capstone Project

YEAR FOUR

Fall Semester
4620/ Clinical Externship in Audiology
4630

Spring Semester
4621/ Clinical Externship in Audiology
4631

* These courses may be waived if an equivalent course has been completed.

PACS offers a collaborative environment for students, with a boundless supply of resources and opportunities. The program provides diverse clinical experiences for students, enabling them to enter the professional field with confidence and well-developed knowledge and skills.

— Veronica Henson, AuD student
Vancouver, Wa.
The Master of Science in Deaf Education (MSDE) program prepares students as teachers of children who are deaf or hard of hearing. With its origins going back to 1914, the program is recognized internationally as one of the most prestigious of its kind in the world. The program’s intensive curriculum, emphasis on immersion in practice teaching, and experienced faculty attract students nationally from a wide variety of backgrounds.

**Curriculum**

The two-year curriculum is rooted in learning the development of speech, language and social skills in children, early intervention, and audiology. With that as a foundation, students study the factors necessary for high-quality education from birth to grade 12 for children who are deaf or hard of hearing.

Students learn about and participate in the teaching process, from the first diagnosis and early intervention through family-centered counseling and educational options for the child. Students also learn about assistive listening devices, including digital hearing aids, cochlear implants, FM systems and sound field systems.

A one-year curriculum option is available for select students with a degree and significant teaching experience in deaf education. All students must complete a comprehensive examination and independent study in the final semester.

**Student Teaching Experiences**

Our students build their knowledge and skills through classroom instruction and immersive, hands-on student-teaching experiences. Teaching experiences are available at approximately 10 local sites, which include both public and private schools serving more than 700 children who are deaf or hard of hearing. Teaching experiences outside of the St. Louis area are also available.

In addition, our nationally recognized medical school and hospitals provide unique opportunities such as observing cochlear implant surgeries and touring a hospital neonatal intensive care unit.

**Research**

The integration of current research into the curriculum is a unique feature of the program. Through coursework and completion of an Independent Study, students learn how to be consumers of research and to apply the knowledge gained to their own teaching.

**Accreditation and Certification**

The program is accredited by the Missouri Department of Elementary and Secondary Education and the Council on Education of the Deaf (CED). All graduates of the two-year program will meet the academic, practical and research requirements for recommendation for initial certification in Missouri (Deaf/Hearing Impaired, Birth-Grade 12) and by CED.

Deaf Education: A Listening and Spoken Language Approach

Auditory-oral deaf education supports the philosophy that children who are deaf or hard-of-hearing can learn to listen and talk. Its teachers help children develop their spoken and written language skills through current teaching strategies and auditory technologies, such as cochlear implants and digital hearing aids.
Master of Science in Deaf Education (MSDE) Curriculum

YEAR ONE

Fall Semester
401 Anatomy and Physiology of Speech and Hearing
4011 Behavior Management
424 Speech and Hearing Sciences
4301 Sign Language I*
434 Typical Language Development*
4515 Language Instruction for Children Who are Deaf or Hard of Hearing
5601 Clinical Audiology I

Spring Semester
444 Amplification Systems and Aural Rehabilitation for Children
4501 Observation and Practicum in Deaf Education
4525 Reading Instruction for Children Who are Deaf or Hard of Hearing
454 Education Curriculum for Children Who are Deaf or Hard of Hearing
458 Speech for Children Who are Deaf or Hard of Hearing
551 Research Seminar
554 Fundamentals of Early Intervention and Child Development

YEAR TWO

Fall Semester
416 Evaluation Techniques for Children Who are Deaf or Hard of Hearing
4511 Practicum in Deaf Education
4513 Practicum in Reading for Children Who are Deaf or Hard of Hearing
455 Education Curriculum for Children Who are Deaf or Hard of Hearing
555 Early Intervention: Serving Children Who are Deaf or Hard of Hearing Birth to Age 5

Spring Semester
4512 Practicum in Deaf Education
4514 Practicum in Reading for Children Who are Deaf or Hard of Hearing
457 Counseling Parents of Children Who are Deaf or Hard of Hearing
519 Psychosocial and Educational Foundations of Deafness
558 Teaching Portfolio
570 Independent Study

Additional courses required for teacher certification:
- Child and Adolescent Psychology
- Education and Psychology of the Exceptional Child

Additional elective course:
4302 Sign Language II

*These courses may be waived if an equivalent course has been completed.

Deaf education is an ever-changing field. PACS understands this and encourages exploration and research into new teaching practices and curricula. This mindset allows students to accomplish more than they ever imagined.

— Haley Black, MSDE ’11
teacher of the deaf or hard of hearing, Special School District of St. Louis County St. Louis, Mo.
The Doctor of Philosophy (PhD) Program prepares students for academic and research careers in speech and hearing sciences. Established in 1947, the program is dedicated to fostering scientific inquiry in speech and hearing sciences and related disciplines. The program is administered through Washington University in St. Louis’ Graduate School of Arts & Sciences.

Curriculum
The curriculum combines interdisciplinary academic coursework, teaching experiences and research training and culminates in a dissertation. Each student’s experience can be tailored to his or her individual interests.

The PhD requires 72 hours of graduate credit. Generally, 24 hours of graduate credit may be transferred toward the PhD from another institution; graduates of our AuD and MSDE programs are provided with advanced standing and may transfer up to 48 or 36 hours respectively.

Teaching Experiences
Teaching experiences prepare students to become effective teachers and communicators of their discipline and their own research. All PhD students receive training in pedagogy and complete teaching experiences at the introductory and advanced levels under the guidance of a faculty mentor.

Research
Students immerse themselves in the world-class research environment of Washington University. As they conduct their own original work, they participate in colloquia, grand rounds, brown bag seminars, research seminars, journal clubs and similar opportunities. The program fosters opportunities to publish and participate in professional conferences. In the final year, students present and defend their dissertation.

Affiliated Research
PACS is affiliated with the Department of Otolaryngology, which operates one of the nation’s largest hearing and deafness research programs. Topics include:

- Adult aural rehabilitation
- Biology of hearing and deafness
- Childhood deafness
- Cochlear implants
- Dizziness and balance
- Hearing aids

While the program’s academic rigor is second to none, its supportive faculty truly make the student experience a great one. They are excellent advocates for their students and have already demonstrated their dedication to my success!

— Jenna Voss, PhD student
St. Louis, Mo.
The consortium of graduate-education, research and clinical programs known today as CID at Washington University School of Medicine was born out of the pioneering efforts of St. Louis physician Max Goldstein, MD. In 1914, he founded the Central Institute for the Deaf (CID), where doctors and teachers worked together to help people who were deaf or hard of hearing. When CID’s school building opened two years later, its auditory/oral methods for instructing children who were deaf or hard of hearing were groundbreaking.

Washington University and CID first joined forces in 1931, when CID’s established teacher training program became the first deaf education undergraduate program to affiliate with a university. Graduate programs in deaf education, audiology, and speech and hearing sciences soon followed.

CID’s research efforts began in the 1930s to study the anatomy and science of hearing. During World War II, CID’s research on hearing loss in military personnel laid the foundation for the field of audiology. CID also pioneered hearing testing and hearing aids and opened the country’s first hearing aid clinic in 1941. In September 2003, a new affiliation transferred CID’s graduate degree programs, research programs and adult audiology clinic, along with its building, to Washington University School of Medicine. The CID school continues to operate on the School of Medicine campus as CID – Central Institute for the Deaf.

Today, these programs continue to work together to fulfill a shared mission to serve people who are deaf or hard of hearing.

### Highlights

#### Child Education
- First parent-infant program for children who are deaf or hard of hearing (1958)
- Development of materials for assessment of early speech perception and word-recognition skills in children and adults (since 1914)

#### Graduate Education
- First deaf education teacher training program affiliated with a university (1931)
- First deaf education master’s program (1936)
- Among the first audiology training programs in the country (1947)

#### Research
- Development of digital hearing-aid technology (early 1980s)
- Seminal findings about how the ear works, hearing loss and rehabilitation (since 1930)
- Leading textbooks in the field (since 1930s)

#### Clinical
- Nation’s first hearing aid clinic (1941)
- Development of commonly used materials for speech recognition testing in adults and children (since 1952)
The School of Medicine, founded in 1891, has a rich history of success in research, education and patient care. *U.S. News & World Report* ranks the school among the top medical schools in the United States, and our students bring impressive credentials to their studies. Each year, many Washington University physicians are listed in *The Best Doctors in America*. Fourteen faculty members are fellows of the National Academy of Sciences; 25 belong to its Institute of Medicine. Seventeen Nobel laureates have been associated with the School of Medicine.

The School operates one of the nation’s five-largest academic clinical practices in partnership with nationally ranked hospitals. Our research enterprise is among the most extensive in the world. Groundbreaking multidisciplinary work in neuroscience, diabetes, diagnostic imaging, cardiovascular diseases, genetics, immunology and many other fields are among our strengths.

The program’s depth and breadth offers outstanding learning opportunities in all areas of audiology and communication sciences. The program excels at providing the people and resources each student needs to pursue his or her individual interests to the fullest.

— Michael Valente, PhD
professor of otolaryngology and of audiology and communication sciences
St. Louis' affordability and friendly character make it an attractive location for graduate students. The fun and culture of a big city are here, but living is easy and affordable. The university helps by providing students a free pass to the metro-area public transportation system — MetroBus and MetroLink light rail.

The Washington University Medical Center campus is located in the cosmopolitan Central West End neighborhood with its eclectic bookstores, coffee houses and sidewalk cafes. Housing options include affordable apartments in the Central West End and the School of Medicine’s Olin Residence Hall on campus.

St. Louis has much to offer the arts lover, including plentiful music venues and museums. Sports fans enjoy St. Louis Cardinals baseball, St. Louis Blues hockey and St. Louis Rams football.

St. Louis’ outdoor activities can be found in and around the metropolitan area; bike trails line both the Mississippi and Missouri rivers, and the Ozark mountains and river valleys are perfect for backpacking, camping, fishing and canoeing.

Visit explorestlouis.com for more information.

Forest Park
Forest Park lies across the street from the medical campus. This massive green space — 500 acres larger than New York’s Central Park — offers countless facilities for athletics, cultural activities and fun.

Festivals
- Bark in the Park Festival (MAY)
- Brewers Heritage Festival (JUNE)
- Earth Day Festival (APRIL)
- The Great Forest Park Balloon Race (SEPTEMBER)
- St. Louis African Arts Festival (MAY)
- St. Louis Wine Festival (SEPTEMBER)
- Scottish Games and Cultural Festival (OCTOBER)
- Shakespeare Festival (MAY)

Athletic Facilities
- Jogging, bicycling and in-line skating paths
- Lakes for boating and fishing
- Soccer, rugby and cricket fields
- Tennis, basketball and handball courts
- Two golf courses
- Outdoor ice rink

Attractions
- Missouri History Museum
- Muny Opera
- Saint Louis Art Museum
- Saint Louis Science Center
- Saint Louis Zoo
Faculty

Childhood Deafness • Adult Aural Rehabilitation
Johanna G. Nicholas, PhD
Catherine Schroy, MSSH
Brent P. Spehar, PhD
Nancy Tye Murray, PhD
Rosalie Uchanski, PhD

Clinical Audiology • Hearing Aids • Cochlear Implants
Carol E. Bergmann, AuD
Greta M. Bohnenkamp, MS
Lisa S. Davidson, PhD
Jill B. Firszt, PhD
Dave A. Harris, PhD
Roanne K. Karzon, PhD
Christina M. Koehler, MSSH
Robert J. Mareing, AuD
E. Tracy Mishler, AuD
Amanda J. Ottmann, PhD
Kimberly K. Ott, MS
Judy Peterein, AuD
Lisa G. Potts, PhD
Marie K. Richter, AuD
Belinda Sinks, AuD
L. Maureen Valente, PhD
Michael Valente, PhD

Deaf Education
Lynda C. Berkowitz, MSSH
Amy L. Birath, AuD
Christine M. Clark, MAEd
Amanda L. Dunaway, MSDE
Elizabeth A.C. Elliott, MAT
Christine H. Gustus, MSSH
Heather Hayes, PhD
Karen R. Kupper, MSSH
Barbara A. Lanfer, MAEd
Jean S. Moog, MS
Justine L. Preston, MA
Mary A. Shortal, MA
Karen S. Stein, MAEd
Ellen R. White, MAEd, MSSH

Dizziness and Balance • Biology of Hearing and Deafness
Jianxin Bao, PhD
Carl D. Bohl, PhD
Barbara A. Bohn, PhD
Richard A. Chole, MD, PhD
William W. Clark, PhD
Brian T. Faddis, PhD
Keiko Hirose, MD
Timothy E. Hullar, MD
James D. Miller, PhD
Kevin K. Ohlemiller, PhD
Mark E. Warchol, PhD

Graduate students have the opportunity to learn from a diverse faculty who are dedicated to sharing their expertise. The learning atmosphere is open and encouraging. Students are challenged to think, their opinions are valued, and creative thinking and problem solving are highly encouraged.

— Lynda Berkowitz, MSSH
instructor in audiology and communication sciences
Prerequisites
To be considered for admission, applicants must hold a bachelor’s degree or higher from an accredited university. There are no specific prerequisite courses for applicants to the AuD and MSDE programs. Courses listed below are required for professional certification and/or licensure upon graduation. Unless otherwise noted, coursework in each subject must be equivalent to three semester hours or more of academic credit.

Completion of the courses listed below is recommended, but not required, prior to enrollment. Any deficits generally can be completed during graduate studies without an extension of the program.

AuD Program
- Normal language development
- Disordered speech and language development
- Sign language2

MSDE Program
- General coursework in the arts, history and government, English composition, mathematics, oral communication, science, behavioral sciences and multicultural issues1
- Child and adolescent psychology
- Education and psychology of the exceptional child
- Normal language development
- Sign language2

PhD Program
- Competitive applicants generally hold a master’s degree in a related field and/or have relevant research experience.

1 A degree in the liberal arts generally fulfills these requirements.
2 Must be equivalent to two semester hours or more of academic credit.

Application Procedures
Individuals interested in applying must do so online at gradapply.wustl.edu. The following items are required and must be received by the stated application deadline:
- Completed application, including personal statement
- Application fee (non-refundable) of $60 ($80 for international applicants)
- Official transcripts from all college/university coursework
- Three letters of recommendation
- Official scores from the GRE, submitted to Institution Code 6929 (Washington University College of Arts & Sciences), Department Code 0602 (Audiology)
- A campus visit or phone interview is strongly encouraged prior to the application deadline and can be arranged by contacting the PACS office
- Official scores from the Test of English as a Foreign Language (TOEFL) for all international applicants whose native language is not English

Application Deadlines
All application materials for the AuD and MSDE programs must be received by February 15. Applications completed after this deadline will only be considered for placement on a wait list and/or if there is a space in the program.

All application materials for the PhD program must be received by January 15. Applicants to the MSDE program may also elect to submit application materials by the early consideration deadline of December 15. A limited number of admission offers will be made following this deadline.

Tuition and Fees
Full-time tuition for students entering the AuD and MSDE program during the 2014–15 academic year is $34,500 per year plus a non-refundable matriculation fee of $200. Part-time tuition is $850 per semester hour. Tuition rates will not increase above the amount set at the time of enrollment, assuming continuous full-time enrollment. Full-time tuition also includes student health, life, and disability coverage through Washington University School of Medicine.

The PhD program follows the tuition and fee structure of the Graduate School of Arts & Sciences. For more information, please visit graduateschool.wustl.edu.

Additional fees may be required for international students.

Financial Assistance
PACS is committed to enrolling talented, motivated students from diverse backgrounds. Historically, we have provided financial assistance to 100 percent of our students through a variety of support mechanisms.

Scholarships
Scholarships are the primary form of financial support for our students. Offered at the time of admission, scholarships are guaranteed for all years of study, provided the student remains in good standing. There is no work requirement in exchange for the scholarship during the student’s enrollment. A service obligation may be required for some scholarship recipients.

- AuD student scholarships generally reduce the amount of the annual tuition owed by 25 percent to 50 percent.
- MSDE student scholarships provide up to 100 percent tuition remission.
- PhD students are generally provided a minimum of 80 percent tuition remission.
Other Opportunities

Following admission, a number of other opportunities may also be available. Announcements and information are distributed to students directly as these are available.

- A limited number of assistantships are available on a competitive basis. These positions typically provide a financial award in exchange for a work commitment to PACS, such as serving as a teaching or clerical assistant.

- Federal work-study positions may be available to qualified students. Such positions generally involve clerical work within PACS.

- Part-time, paid positions are often available. Recent positions have involved working with children in the school or a position in a research lab.

- A number of other internal scholarships and awards are also available on an annual basis following matriculation.

- For information about loans:
  – AuD and MSDE applicants may contact the Office of Student Financial Planning at (888) 840-3239, money@msnotes.wustl.edu or wumsfinaid.wustl.edu.
  – PhD applicants may call (314) 935-6821.
Non-Discrimination Statement

Washington University encourages and gives full consideration to all applicants for admission, financial aid and employment. The university does not discriminate in access to, or treatment or employment in, its programs and activities on the basis of race, color, age, religion, sex, sexual orientation, gender identity or expression, national origin, veteran status, disability or genetic information. Inquiries about compliance should be addressed to the university’s Vice Chancellor for Human Resources, Washington University, Campus Box 1184, One Brookings Drive, St. Louis, MO 63130. The School of Medicine is committed to recruiting, enrolling and educating a diverse student body.

Criminal Background Check and Drug Screening

Incoming students in the School of Medicine must undergo criminal background checks and drug screening before matriculation because of requirements of the Joint Commission on Accreditation of Health Organizations (JCAHO). These confidential procedures are required of all health care workers, students and volunteers who participate in patient-related health care activities at the hospitals and health care facilities with which Washington University School of Medicine is affiliated. In order to matriculate, a student who has accepted admission must consent to criminal background checks, which must be completed successfully before he or she can matriculate in the School of Medicine. Consent forms will be distributed to applicants who are offered positions in the incoming class. Similarly, at the time of orientation, all incoming pre-matriculant students must submit to screening for the following substances: THC-cannabis, cocaine, opiates, amphetamines, and PCP-phencyclidine. A confirmed positive test will preclude enrollment into the School of Medicine. All costs for U.S. background checks and drug screenings are included in the stated tuition and fees. The student will be responsible for any costs associated with international background checks required for matriculation and/or practicum placements.