Rehabilitation and Participation Science

Advances in our understanding of the mechanisms underlying activities of daily living and the development of new technologies have created a need for scientific evidence that can guide efforts at increasing participation and improving quality of life for persons with disabilities throughout the lifespan. The RAPS program provides advanced interdisciplinary training necessary for students aspiring to lead the next generation of scientific advances in neurorehabilitation and environmental strategies. Students will gain a solid broad foundation in neurorehabilitation and participation sciences and develop a research specialization through mentored training in one or more of the following laboratories:

- Rehabilitation Neuroscience (Dr. Scott Frey, RAPS Chair)
- Infants and Children at Risk (NICU) (Dr. Roberta Pineda)
- Child Health and Education (Dr. Allison King)
- Health and Disability Research (Dr. Alex Wong)
- Participation, Environment and Performance (Dr. Susan Stark)
- Other Washington University Laboratories if a qualified faculty mentor agrees to support the RAPS program mission and requirements (Approval of RAPS Chair)

Graduates of the RAPS program will be prepared for a career as an independent scientist and academician at a research university, research institute, or an industry setting.

Contact Person: RAPS Academic Coordinator
Phone: (314) 286-1619
Departmental website: http://ot.wustl.edu/education/phd-in-rehabilitation-and-participation-science-142

Chair
Scott Frey
Associate Director, Program in Occupational Therapy; Professor of Occupational Therapy and Neurology
PhD, Cornell University

Professor
Carolyn Baum
Elias Michael Director and Professor of Occupational Therapy, Neurology, and Social Work
PhD, Washington University
OTR/L, University of Kansas

Assistant Professors
Nico Dosenbach
Assistant Professor of Neurology and Occupational Therapy
MD, PhD, Washington University

Allison King
Assistant Professor of Occupational Therapy and Pediatrics
MD, University of Missouri

Bobbi Pineda
Assistant Professor of Occupational Therapy and Pediatrics
PhD, University of Florida
OTR/L, University of Florida

Susan Stark
Assistant Professor of Occupational Therapy, Neurology, and Social Work
PhD, University of Missouri
OTR/L, Washington University School of Medicine

Alex Wong
Assistant Professor of Occupational Therapy and Neurology
PhD, Hong Kong Polytechnic University
DPhil, University of Illinois at Urbana-Champaign

Degree Requirements

PhD Application Process and Requirements

Preferably, applicants will have a clinical degree in a medical or rehabilitation field or a graduate degree in public health, engineering, neuroscience, psychology or other biological or social science field. Exceptional applicants with a baccalaureate degree from an accredited college or university, relevant course work and demonstrated research experience will be considered.

Prerequisites will vary somewhat depending on the student's desired area of specialization. All applicants should have completed undergraduate-level courses in: Statistics, Research Methods, Human Physiology, and advanced courses in Social Sciences and Psychology. Students interested in the rehabilitation neuroscience foci must have a course in neuroscience/biological psychology, and the community track foci must have an epidemiology course. If one or two prerequisites are missing prior to admission they can be taken concurrently with required RAPS courses, but will not count for required credits. Prior research experience is strongly encouraged.

Curriculum

Students must complete 30 units of core courses, 12-15 units of electives, 18-21 research units in the lab of the mentor and 6-9 hours of dissertation.

Required Core Courses (30 units)
research credit per semester followed by an increase as course work is completed. The student will participate 16 hours a week in the mentor's laboratory; this time will be central to the student's area of study. The student will work with the mentor in his or her laboratory to learn the basic processes of the laboratory and the research skills that will be central to the student's area of study. The student will work with the mentor's guidance to conduct studies that should lead to peer-reviewed publications and may contribute to the dissertation research. The student will spend some of the research units in the first year in another faculty's laboratory to learn about research units in another faculty's laboratory to do dissertation research. The student will spend some of the time working with the mentor's laboratory to conduct a project or do a lab rotation to gain understanding of participation and the multiple aspects of rehabilitation science.

Beginning the first semester the student will spend a minimum of 16 hours a week in the mentor's laboratory; this time will increase as course work is completed. The student will be enrolled in 3 hours of research credit per semester followed by dissertation credit after the student successfully completes his or her comprehensive exams.

It is possible that the student may find that his or her interests lie in an area different from that originally selected. In this case, the student may switch laboratories and mentors with the approval of the RAPS Program Chair and necessary adjustments in course and laboratory experiences.

Dissertation (6-9 units)

Course Descriptions

RAPS: Theories, Models and Classifications of Rehabilitation and Participation Science — The course will explore the historical and theoretical foundations of rehabilitation and participation science and the evolution of models and classification systems. Students will find and use specific theories to ground their understanding of the area of their specialization.

RAPS: Measurement Theory and Application — Students will be introduced to the principles of measurement and the statistics that support the development of assessments that will be central to their area of study. These will include psychological, physiological, sensory, motor, cognitive as well as subjective and objective assessments to measure patient-related outcomes, and the environmental and quality of life issues that are central to participation. Students will work with data from the mentor's lab to learn the statistical skills necessary for measurement development.

RAPS: Nervous System Function and Performance — The course will provide an in-depth understanding of the human nervous system and basic research pertaining to factors that influence performance. The course focuses on psychological, physiological, sensory, perceptual, motor, cognitive mechanisms and processes to lay the foundational principles of performance and to learn how the capacity to perform relates to participation.

RAPS: Environment Factors and Participation — The course will provide an in-depth understanding of person-environment interactions that support community participation. The course focuses on the physical, cognitive, sociocultural and policy aspects of the environment that impact participation and to learn how the capacity to perform relates to participation.

RAPS: Measurement Theory and Application — Students will be introduced to the principles of measurement and the statistics that support the development of assessments that will be central to their area of study. These will include psychological, physiological, sensory, motor, cognitive as well as subjective and objective assessments to measure patient-related outcomes, and the environmental and quality of life issues that are central to participation. Students will work with data from the mentor's lab to learn the statistical skills necessary for measurement development.

RAPS: Nervous System Function and Performance — The course will provide an in-depth understanding of the human nervous system and basic research pertaining to factors that influence performance. The course focuses on psychological, physiological, sensory, perceptual, motor, cognitive mechanisms and processes to lay the foundational principles of performance and to learn how the capacity to perform relates to participation.

RAPS: Environment Factors and Participation — The course will provide an in-depth understanding of person-environment interactions that support community participation. The course focuses on the physical, cognitive, sociocultural and policy aspects of the environment that impact participation and to learn how the capacity to perform relates to participation.

Research Design and Methods — This course provides the basis of research design and the methodologies that frame questions, design analysis and report findings. Content includes experimental, qualitative, quantitative, single case, and the phases of clinical trials design.

Research Ethics and Regulatory Affairs — This course will provide an understanding of the ethical guidelines, issues, and challenges of conducting research on human subjects. Issues such as conflict of interest, genetic testing, limits of confidentiality, risk, and the distinction between compliance and ethics will be explored. As we learn about protecting research
groups and interests and explaining rights and liabilities, we will study health care legislation and regulations, guidelines, contractual matters, and the complex regulatory framework that governs human subject research. Finally, we will learn to use an ethical problem-solving model in clinical research.

**Intermediate Statistics** — This course includes basic descriptive and inferential statistics through multiple linear and logistic regressions. Students will analyze data from the mentor’s laboratory as part of the learning experience.

**Advanced Statistics (determined by focus)** — Depending on the methods chosen by the student and approved by her or his committee, the student will take an advanced statistics class that will guide the analysis. The course work could include such areas as neural networks, Structural Equation Models (SEM).

**Teaching Strategies and Practicum** — This course prepares students with tools for the academic teaching environment, including philosophical approaches to education, applying learning theories, goal-writing, assessment strategies, curriculum and instructional design, and identifying research that supports effectiveness of educational approaches. Students evaluate perspectives on teaching, prepare lessons and syllabi, and construct personal philosophies of teaching and learning. It also includes a supervised classroom teaching experience in a content area relevant to the student’s area of interest.

**Skills for the Developing Scientist** — This course will introduce the skills of building a career development plan, constructing a curriculum vitae, advance skills in managing references, constructing posters and making presentations, learning the grant mechanisms from NIH, ACL-NIDRR, CDC and other federal agencies and major foundations that provide support to areas of the student's interests.