Movement Science

The PhD in Movement Science is an interdisciplinary program designed to prepare students for productive research careers in academia and industry. The program offers training to investigators who seek to answer questions about human movement, its functions and its dysfunctions. The program is organized around three core content areas: biocontrol (neuroscience), bioenergetics (exercise physiology) and biomechanics. Our students are trained to investigate and improve movement impairments in people with chronic diseases such as obesity, stroke, diabetes, neuropathy, Parkinson’s disease and low back pain.

The Movement Science program is administered through the Physical Therapy program. Applicants come from a variety of academic backgrounds, including physical therapy, exercise science, kinesiology, biomedical engineering, neuroscience and occupational therapy. Students learn from and collaborate with scientists from multiple departments, such as anesthesiology, medicine, psychiatry, orthopedics, biomedical engineering, psychology, neurology and biology.

Accepted students receive full tuition remission, a stipend and health insurance. The Movement Science program is supported by National Institutes of Health training grant T32HD007434.

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Faculty

Chair  
Gammon M. Earhart  
Professor  
PhD, Washington University  
Neural control of locomotion in people with Parkinson’s disease

Professors  
W. Todd Cade  
PhD, University of Maryland, Baltimore  
Mechanisms and treatments of metabolic diseases  

B. Ruth Clark  
PhD, Saint Louis University  
Promotion of nutrition and exercise in urban residents

Joseph W. Klaesner  
PhD, Vanderbilt University  
Rehabilitation engineering

Catherine E. Lang  
Associate Director, Movement Science Program  
PhD, Washington University  
Stroke recovery and rehabilitation; neurorehabilitation

Michael J. Mueller  
PhD, Washington University  
Metabolic and movement factors in people with diabetes mellitus (DM)

Susan B. Racette  
PhD, University of Chicago  
Dietary and exercise interventions for health promotion and disease prevention

Linda R. Van Dillen  
PhD, Washington University  
Musculoskeletal pain problems in the low back, hip and neck

Assistant Professors  
Michael Harris  
PhD, University of Utah  
Whole body & joint-level orthopaedic biomechanics

Gretchen A. Meyer  
PhD, University of California, San Diego  
Mechanical and cellular contributors to skeletal muscle disease

Diana C. Parra Perez  
PhD, Washington University  
Physical activity and healthy diets and their role in preventing chronic disease and obesity

Degree Requirements

PhD in Movement Science

Students will complete the required courses and electives during the first two years of the program. In addition to courses, the requirements to complete the PhD degree include the following:

• Qualifying examination: Part one of the qualifying exam requires the student to develop a research proposal pertinent to the projected area of dissertation research that is based on a question/problem provided by the student’s mentor(s). Part two of the qualifying exam is an oral examination that consists of a presentation of the proposal by the student
followed by a question-and-answer period with the faculty reviewers.

- **Laboratory research**: Students will develop, implement and complete original laboratory research appropriate for a doctoral dissertation.
- **Doctoral dissertation**: Students will successfully provide an oral defense of their dissertation proposal, complete a written doctoral dissertation, and defend an oral presentation of the doctoral dissertation.

On average, students complete the degree in four and a half years.