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 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 Program in Physical Therapy. Applicants come from a variety of academic backgrounds: physical therapy, exercise science, kinesiology, biomedical engineering, neuroscience, and occupational therapy. Students learn from, and collaborate with, scientists from multiple departments, such as medicine, psychiatry, orthopedics, biomedical engineering, psychology and biology.

Accepted students receive full tuition remission, a stipend, and health insurance. The Movement Science Program is supported by NIH 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
B. Ruth Clark
PhD, Saint Louis University
Promotion of nutrition and exercise in urban residents

Catherine E. Lang
Assistant 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

David R. Sinacore
PhD, West Virginia University
Diabetic foot disease, contributors to physical frailty in older adults

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

Dequan Zou
DSc, Washington University
Biomechanics modeling and computer simulation

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

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

Joseph W. Klaesner
PhD, Vanderbilt University
Rehabilitation engineering

Assistant Professors
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. In addition to courses, the requirements to complete the PhD degree include:

- **Qualifying examination**: Part one of the qualifying exam is a written test to assess the knowledge about the three curriculum cores (biocontrol, bioenergetics and biomechanics). Part two requires the student to develop a research proposal pertinent to their projected area of dissertation research.

- **Laboratory research**: Students will develop, implement and complete original laboratory research appropriate for a doctoral dissertation.

- **Doctoral dissertation**: Students will successfully defend 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 4.5 years.