

Human Movement and Rehabilitation Sciences, PhD (Boston)

The Department of Physical Therapy, Movement, and Rehabilitation Sciences offers a PhD program in human movement and rehabilitation sciences. The PhD program seeks to prepare graduates to conduct independent (original) basic, translational, and applied research with the goal of creating new knowledge about neuromotor mechanisms and methods of restoring and maximizing human functional capacity and well-being across the life span. The program emphasizes core competencies in motor control and motor learning, movement measurement and analysis, knowledge translation theory, and the use of traditional and emerging technologies. The program is based on the integration of core skills and concepts across the multiple disciplines that are associated with human movement and rehabilitation sciences, coupled with the acquisition of research methodology, analyses, and skills, as well as specialization within specific areas of human movement and rehabilitation research.

The program showcases the unique faculty and research laboratories in human movement and rehabilitation sciences, as well as highly ranked programs in Bouvé College of Health Sciences, the College of Science, and the College of Engineering. Northeastern is dedicated to advancing the field of human movement and rehabilitation sciences and translating research from bench to clinic. Students benefit from our new research laboratories utilizing state-of-the-art movement and rehabilitation methods including virtual reality, ultrasound, neuroscience, neurophysiology, robotics, and movement measurement technologies.

Advanced Entry

Based on a student's background in their preceding master's or clinical doctorate degree, core coursework and total hours for the advanced entry program may vary. The graduate program director will consider all the program requirements and applicants' previous experience when advising students on a plan of study. All students, whether entering from traditional or advanced PhD pathways, will complete the milestones as documented in the curriculum.

Please visit Bouvé College Learning Outcomes (<https://bouve.northeastern.edu/learning-outcomes/>) for the specific student learning outcomes for this program.

Program Requirements

Milestones

All students, whether entering from traditional or advanced PhD pathways, will complete the following milestones:

- Annual review
- Qualifying exam
- Dissertation committee
- Dissertation proposal
- Dissertation defense

Core Requirements

Code	Title	Hours
Seminar		
Students must enroll in the following course every semester until start of the dissertation phase of the program (the course is repeatable two times for 1 semester hour and four times for 0 semester hours):		2
PT 7030	Interdisciplinary Seminar in Rehabilitation Science	
Rehabilitation Science and Human Movement		
PT 7001	Core Concepts in Rehabilitation Science and Research	3
PT 7005	Experimental Design and Applied Statistics	4
PT 7020	Technologies in Movement and Rehabilitation Science	4

Electives

Code	Title	Hours
Complete 19 semester hours from the list below chosen in consultation with a faculty advisor.		19
Some courses may require prerequisite coursework.		
ARTG 6460	Human-Centered AI	
BIOE 5235	Biomedical Imaging	
BIOE 5800	Systems, Signals, and Controls for Bioengineers	
BIOE 5810	Design of Biomedical Instrumentation	
BIOL 5601	Multidisciplinary Approaches in Motor Control	
CAEP 5877	Research Methods in Applied Psychology	
CAEP 6326	Behavioral Concepts and Principles	

CS 5047	Exploring AI Trends and Tools
EDUT 6150	AI in Education
EXSC 5210	Physical Activity and Exercise: Prescription, Measurement, and Testing
HLTH 5450	Healthcare Research
HLTH 5800	AI Across the Health Sciences
IE 5630	Biosensor and Human Behavior Measurement
IE 5640	Data Mining for Engineering Applications
IE 6500	Human Performance
IE 7315	Human Factors Engineering
JRNL 6460	AI in Media Industries
ME 5250	Robot Mechanics and Control
ME 5659	Control Systems Engineering
ME 5665	Musculoskeletal Biomechanics
ME 7247	Advanced Control Engineering
MISM 6250	Strategic AI for Business
PHIL 5110	Responsible AI
PHTH 5202	Introduction to Epidemiology
PHTH 5210	Biostatistics in Public Health
PHTH 6202	Intermediate Epidemiology
PHTH 6210	Applied Regression Analysis
PHTH 6440	Advanced Methods in Biostatistics
PT 5138	Neuroscience
PT 5150	Motor Control, Development, and Learning
PT 5209	Neurological Rehabilitation 1
PT 5321	Applications of Biomechanics in Human Function and Movement
PT 6221	Neurological Rehabilitation 2

Dissertation

Code	Title	Hours
PT 9990	Dissertation Term 1	
PT 9991	Dissertation Term 2	

Program Credit/GPA Requirements

32 total semester hours required

Minimum 3.000 GPA required

Advanced Entry Program Requirements

Milestones

Annual review

Qualifying exam

Dissertation committee

Dissertation proposal

Dissertation defense

Core Requirements

Based on a student's background in their preceding master's degree, core coursework and total hours for the advanced entry program may vary. The graduate program director will consider the following program requirements when advising students on a plan of study.

Code	Title	Hours
Seminar		
Students must enroll in the following course every semester until the start of the dissertation phase of the program:		2
PT 7030	Interdisciplinary Seminar in Rehabilitation Science (Repeatable 2 times for 1 semester hour and 4 times for 0 semester hours)	
Rehabilitation Science and Human Movement		
PT 7001	Core Concepts in Rehabilitation Science and Research	3

PT 7005	Experimental Design and Applied Statistics	4
PT 7020	Technologies in Movement and Rehabilitation Science	4

Electives

Code	Title	Hours
Complete a minimum of 3 semester hours from the following. Some courses may require a prerequisite course:		3-4
ARTG 6460	Human-Centered AI	
BIOE 5235	Biomedical Imaging	
BIOE 5800	Systems, Signals, and Controls for Bioengineers	
BIOE 5810	Design of Biomedical Instrumentation	
BIOL 5601	Multidisciplinary Approaches in Motor Control	
CAEP 5877	Research Methods in Applied Psychology	
CAEP 6326	Behavioral Concepts and Principles	
CS 5047	Exploring AI Trends and Tools	
EDUT 6150	AI in Education	
EXSC 5210	Physical Activity and Exercise: Prescription, Measurement, and Testing	
HLTH 5450	Healthcare Research	
HLTH 5800	AI Across the Health Sciences	
IE 5630	Biosensor and Human Behavior Measurement	
IE 5640	Data Mining for Engineering Applications	
IE 6500	Human Performance	
IE 7315	Human Factors Engineering	
JRNL 6460	AI in Media Industries	
ME 5250	Robot Mechanics and Control	
ME 5659	Control Systems Engineering	
ME 5665	Musculoskeletal Biomechanics	
ME 7247	Advanced Control Engineering	
MISM 6250	Strategic AI for Business	
PHIL 5110	Responsible AI	
PHTH 5202	Introduction to Epidemiology	
PHTH 5210	Biostatistics in Public Health	
PHTH 6202	Intermediate Epidemiology	
PHTH 6210	Applied Regression Analysis	
PHTH 6440	Advanced Methods in Biostatistics	
PT 5133	Kinesiology	
PT 5138	Neuroscience	
PT 5150	Motor Control, Development, and Learning	
PT 5209	Neurological Rehabilitation 1	
PT 5321	Applications of Biomechanics in Human Function and Movement	
PT 6221	Neurological Rehabilitation 2	
PT 7010	Measurement and Analysis of Human Movement and Bioinstrumentation	

Dissertation

Code	Title	Hours
PT 9990	Dissertation Term 1	
PT 9991	Dissertation Term 2	

Program Credit/GPA Requirements

16 total semester hours required
Minimum 3.000 GPA required