



TECHNISCHE UNIVERSITÄT
CHEMNITZ

Faculty of Behavioural and Social Sciences
Institute of Human Movement Science and Health

Master's Degree

Human Movement Science

Master of Science (M.Sc.)



Understand Movement

Study Human Movement Science



Get a comprehensive education in the area of human movement science

The purpose of this degree course is a comprehensive education in areas of human movement science, from analyzing human movement and motor skills, to program-controlled data processing and computer-based modeling of complex locomotor tasks. One specific core competence of future graduates should be applying this knowledge in the areas of health and human-machine interactions. Subjects included in the direct context of this program include:

- Workplace ergonomics
- Individual fitting and effectiveness of prostheses and orthoses
- Capturing and assessing human movement behavior for certain clinical disorders
- Interpreting and using sensor signals for biofeedback
- Disability management, and
- Developing personalized assistance systems for maintaining mobility

This Master's Degree Program is aimed at graduates with a Bachelor's Degree in sports science or engineering. This program is particularly suitable for those who wish to deepen their knowledge at the interface between biomechanical, medical and technical aspects, and who aim at specializing in the area of human motion analysis in one of the various fields of application (ergonomics, research, health organizations and hospitals, industry).

Interdisciplinarity and goal-oriented thinking are core competences of this program

The core courses and key skills imparted in the Master's degree program Human Movement Science are:

- Profound knowledge of kinesiology with a broad basis in the areas of biomechanics, research and analysis methods, ergonomics, physical loading in the workplace, and the interaction between humans and their environment.
- Readiness to deal with and critically discuss new scientific findings, current research projects, as well as the necessary theoretical and methodological research approaches.
- Creativity employing new concepts, overview of existing problems and possible solutions in the working environment, knowledge of fundamentally existing limits of kinesiology.
- Interdisciplinary thinking, objective and intercultural communication skills, and the ability to work in a team.

With these fundamental qualifications, graduates of this Master's program fulfill the necessary requirements of the future job market to independently and creatively deal with complex tasks in research and development. The imparted technical and kinesiological contents enable students to purposefully implement their knowledge and simultaneously achieve the flexibility that is explicitly demanded of them in this field.

The program targets a growing job market which is in global demand

Over the past few decades, the fields of health, movement, and sports have become an important factor with sociopolitical dimensions, particularly with respect to demographic change. Consequently, there is great demand for specialists with a practical as well as academic education. The field of analysis and modeling of human motion and its interface with engineering and environment offers a broad range of career perspectives in industry (orthopedic and rehabilitation technology) and ergonomics, as well as in high-performance sports.

- Automobile industry
- Institutes and universities
- Manufacturers of motion analysis systems and sports equipment
- athletic training centers
- Medical and rehabilitations centers

Overview of the programme

	1st semester	2nd semester	3rd semester	4th semester
Adaptation Part (Choose between <i>Mechanical Engineering</i> and <i>Physiology in Sport and Science</i> depending on preceding major)				
Mechanical Engineering (must be selected with preceding bachelor or master degree in sports science or related degrees)	Engineering Mechanics 1	Engineering Mechanics 2		
	Mathematics I/1	Mathematics I/2		
Physiology in Sport and Health (must be selected with preceding bachelor or master degree in an engineering related subject, e.g. Sports or Medical Engineering)	Functional Anatomy and Biomechanics	The Human Sensory System		
	Aging, Disuse and Disabilities			
	Instruments in Human Movement Science			
		Instruments in Human Exercise Science		
Obligatory Part	Statistics for Experimental Research 1	Statistics for Experimental Research 2		
	Ergonomics	Human Factors in Technologies		
	Proprioception and Perception			
			Current Issues in Biomechanics – Literature Review (English-speaking)	
			Perspectives in Biomechanics (English-speaking)	
			Project "Clinical Biomechanics" (English-speaking)	
				Project "Human Movement Science"
Optional Part (Choose between three subjects)	Theoretical Neuroscience - Cognitive Computational Models I (English-speaking)	Theoretical Neuroscience - Cognitive Computational Models II (English-speaking)		
	Mathematical Approaches in Biomechanics I/1	Mathematical Approaches in Biomechanics I/2		
	Assessment Criteria in a clinical Context	Assessment Criteria in a psychological Context		
Master Thesis				Master Thesis

Requirements:

Entrance requirements for the Master's Degree Program Human Movement Science are fulfilled by graduates from the Chemnitz University of Technology with a Bachelor's Degree in Sports Engineering or Prevention, Rehabilitation and Fitness Sports, or Medical Engineering. Graduates with a Bachelor's Degree in an equivalent subject also qualify.

Period of Study: 4 semesters

Degree: Master of Science (M. Sc.)

Program Start: Winter semester

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