Research Methods in Sports Science for Interdisciplinary Approaches – *Schedule of Lectures*

International Summer School 20th – 26th of Aug, 2023
German Sport University Cologne

Deutsche Sporthochschule Köln
German Sport University Cologne

Date/Time		09.00–10.00 am	02.00–03.00 pm
Mon 21 Aug, 2023	**Title**	**Mastering the heart-brain connection: harnessing HRV for optimal performance**	**The analysis of expressive body movement**
	Lecturer	Professor Dr. Dr. Markus Raab (Institute of Psychology)	Professor Dr. Hedda Lausberg (Institute of Movement Therapy and Movement-oriented Prevention and Rehabilitation)
	Location	Lecture hall 2, GSU main building (building no. A3)	Lecture hall 3, GSU main building (building no. A3)
	Abstract	Dive into the fascinating world of psychophysiology as we explore the critical role of Heart Rate Variability (HRV) in achieving peak performance. This engaging lecture will elucidate the intricate heart-brain relationship, providing attendees with a strong theoretical and physiological background about HRV, as well as with actionable insights to enhance their resilience, emotional regulation, performance and overall well-being in preparation for the HRV workshop.	In sports, expressive body movement is omnipresent: in the seconds before a soccer penalty shot, in pre-match interviews, during competitions, or in interviews and even interrogations. In these situations, the athletes' nonverbal behaviour reflects their mental state. Analysis systems like NEUROGES, designed for scientific research, allow to analyse and decode these nonverbal expressions, especially in case of hand movements and gestures.
Tue 22 Aug, 2023	**Title**	**Basics and implementation of network meta-analyses in sport, exercise and health**	**Big data in soccer**
	Lecturer	Professor Dr. Lars Donath (Institute of Exercise Training and Sport Informatics)	Dr. Robert Rein (Institute of Exercise Training and Sport Informatics)
	Location	Lecture hall 3, GSU main building (building no. A3)	Lecture hall 3, GSU main building (building no. A3)
	Abstract	Next to randomized controlled trials, meta-analyses (MAs) have the highest level of evidence. While classic MAs focus on the comparison of two interventions, there are often significantly more than only two that can be compared to each other. Therefore, network meta-analyses (NMAs) provide the opportunity to consider direct and indirect comparisons of different interventions. The frequency, direction, and strength of different intervention comparisons can be used to determine a final ranking of their effectiveness.	Regarding Big Data in sports (especially in high-class soccer) research questions in the area of model formation, pattern recognition and simulation of team sports are posed in particular. This includes the development in the field of data analysis and data visualisation as well as the application of modern database systems (Relational and NoSQL). The expertise lies at the intersection between movement sciences, computer science in sports and sport psychology.

Research Methods in Sports Science for Interdisciplinary Approaches – *Schedule of Lectures*
International Summer School 20th – 26th of Aug, 2023
German Sport University Cologne

Deutsche
Sporthochschule Köln
German Sport University Cologne

Date/Time		09.00–10.00 am	02.00–03.00 pm
Wed 23 Aug, 2023	**Title**	**Presentation of AI-based digital tools and their use in analysing dance and sports in higher education**	**Sportslaw: interpretation and evaluation of sport rules**
	Lecturer	Professor Dr. Claudia Steinberg (Institute of Dance and Movement Culture)	Dr. Caroline Bechtel (Institute of Sport Law)
	Location	Lecture hall 3, GSU main building (building no. A3)	Lecture hall 3, GSU main building (building no. A3)
	Abstract	The use and importance of computer-aided analysis have grown rapidly, and not just in the sports sector. Furthermore, we are increasingly challenged in education and dance science to deal with key technologies such as artificial intelligence, deep learning, and human-machine interaction. Our funded research project #vortanz will be presented in this lecture. #vortanz implemented and evaluated an AI-supported assistance system for supporting movement learning processes at university level. The successful interaction of learners, teachers, and technology that must be coordinated to create optimal learning conditions will be central to this lecture.	The lecture dedicates to the juridical methods of interpretation and evaluation of laws and regulations in the field of sports. It will put the focus on the interdisciplinary evaluation methods that have been developed at the Institute for sports law and are conceived specifically for rules issued by sport federations.
Thu 24 Aug, 2023	**Title**	**Experimental research in sport social science**	**Comparative studies in sport politics: approaches, concepts, methods**
	Lecturer	Professor Dr. Sebastian Uhrich (Institute of Sport Economics and Sport Management)	Professor Dr. Jürgen Mittag (Institute of European Sport Development and Leisure Studies)
	Location	Lecture hall 3, GSU main building (building no. A3)	Lecture hall 3, GSU main building (building no. A3)
	Abstract	Experiments are a key method to help establish cause-and-effect relationships in various fields of sport social science, including sport management, sport marketing, sport psychology, and sport media management. This lecture introduces fundamental concepts for conducting experimental research (e.g., basic experimental designs, creation of experimental stimuli) and also reviews more advanced topics (e.g., enhancing realism, instructional manipulation checks, increasing power by increasing effect sizes).	The overall aim of the lecture is to provide a general introduction to the comparative dimension of sport studies with a particular focus on social sciences. Based on an overview of key approaches and methods the lecture will reflect on both potential and limitations of comparative approaches in sport politics.

Date/Time		09.00–10.00 am	02.00–03.00 pm
Fri 25 Aug, 2023	**Title**	**Sport-medicine-associated virtual methodological visions**	**Advanced performance diagnostics in elite sports**
	Lecturer	Professor Dr. Klara Brixius (Institute of Cardiology and Sports Medicine)	Professor Dr. Patrick Wahl (Institute of Exercise Training and Sport Informatics)
	Location	Lecture hall 3, GSU main building (building no. A3)	Lecture hall 3, GSU main building (building no. A3)
	Abstract	This talk will focus on cognitive aspects of mobility related tasks and virtual reality techniques which aim to improve mobility, for example for older people.	The lecture provides insights into new approaches to performance diagnostics and shows results from elite sport.
Sat 26 Aug, 2023	**Title**	**fNIRS and motor-cognition**	
	Lecturer	Junior-Professor Dr. Ingo Helmich (Institute of Movement Therapy and Movement-oriented Prevention and Rehabilitation)	
	Location	Lecture hall 2, GSU main building (building no. A3)	
	Abstract	Functional Near Infrared Spectroscopy (fNIRS) is particularly useful to investigate brain functions of motor-cognition because it allows for measurements without movement restriction. Therefore, fNIRS constitutes a non-invasive, portable tool for functional monitoring and imaging of human brain hemodynamics (changes both in oxy- and deoxyhemoglobin concentration). This neuroimaging modality is also suited for populations and studies where other imaging options are limited, such as infants, children, and patients interacting freely with their environment.	