

Master of Science in Mechanical Engineering

Sports Engineering

CC6



Contacts



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Track description

The growing demand for high-performance sports equipment, the increasing interest in sports science and the economical growth of the sports sector contribute to the need for a new class of technicians.

In the Sports Engineering track, students will apply the principles of engineering to design, develop, and improve sports equipment and facilities, as well as to use data to optimize sports performance and the teams' strategy.

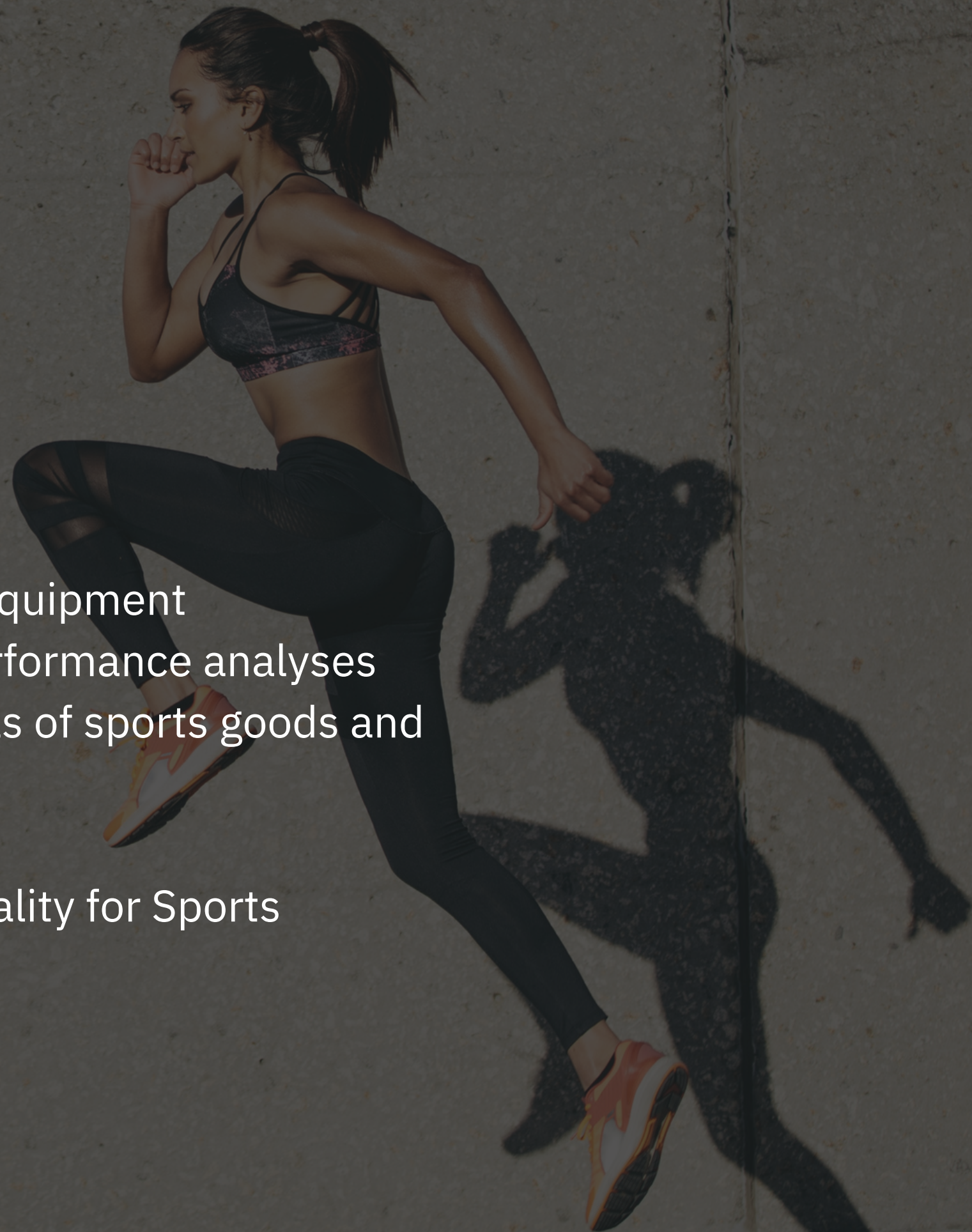
Courses will be a mix of lectures and laboratory projects, with a strong focus on hands-on learning and experimentation. The approach will improve the students' practical knowledge of the tools, techniques, and equipment, as well as their problem-solving skills and critical thinking abilities.



Skills

Students will learn how to:

- design and test prototypes of sports equipment
- perform biomechanical and sports performance analyses
- develop and validate numerical models of sports goods and athletes' performances
- design collaborative robotic devices
- implement Virtual and Augmented Reality for Sports Engineering



CC6: Core Courses

Course Title	YEAR	SEM	ECTS	ECTS GROUP
Data Analysis for Mechanical Systems A	1	1	10	10
Machine Dynamics	1	1	5	5
Advanced Machine Design	1	2	10	10
Manufacturing and De-manufacturing of Sport Equipment	1	2	5	5
Production Management	1	2	5	5
Materials for Sport and Rehabilitation	1	1	5	5

CC6: Track Specific Courses

Course Title	YEAR	SEM	ECTS	ECTS GROUP
Sports Biomechanics and Evaluation of Human Performance	1	2	10	10
Sports Physiology for Engineering	1	1	10	10
Collaborative Robotics	2	1	5	15
Finite Elements Analysis in Sport Equipment Design	2	1	5	
Virtual and Augmented Reality for Sport Engineering	2	1	5	
Elective courses (Data Visualization for Sport, Industrial Design Studio for Wearable Sport, Paralympics and Sport Rehabilitation, Innovation Management, Value Analysis in Tech Sport Business, Technologies for Artificial Intelligence, Sport Strategies and Data Science, ...)	2	1-2	5	25

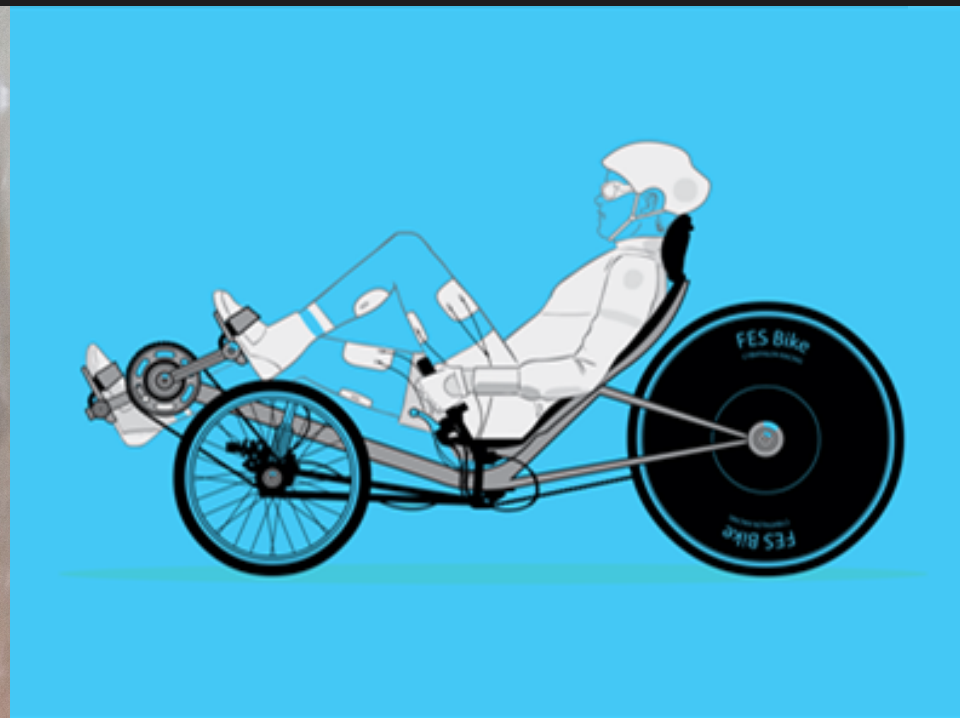
CC6: Lab Experiences

Analysis of performance of elite skiers for optimization of training protocols

Signal processing for the identification of speed-climbing performances

Design and testing of a motor-assisted trike for FES cycling

Design and testing of control solutions for rehabilitation/assistive/resistive devices



CC6: Lab Experiences

Kinematic and structural analysis of a bike pedal crank set

Design and development of smart IoT devices for sports activities

Analysis of factories producing sports goods and how they are managed

VR/AR sports simulator adding multisensorial experience

