Rennes 2 University

Engineering and Ergonomics of Physical Activity (IEAP) Master's Degree: Activity and Performance pathway

The majority of our courses are taught in French. We invite you to also have a look at the list of courses offered in English at Rennes 2.

The IEAP degree is the only one of its kind in Western France.

Objectives

The objective is to train future engineers and researchers to provide scientific, technical and organizational expertise in activity (sports or professional), performance and health analyses.

The training integrates all of the following concepts:

- **Ergonomics and methods**: activity analysis (work analysis tools and methods - expertise in physical load and approaches to mental load, compensatory and preparatory physical activity, notion of fatigue, perception-action coupling).
- **Human-machine-environment interactions** in the context of an activity involving the user's movements, with a strong focus on physical activities, complemented by an awareness of cognitive aspects.
- **Convergence between ergonomics, performance optimization and operational excellence** (Six Sigma, Kaizen, Theory of Constraints, project management, agile methods), gesture ergonomics (prescribed vs. actual gestures) and continuous improvement.
- **Ergonomics and design, Engineering sciences and R&D** (R&D project management, functional and technical specifications, engineering and technical tools, food supplements and products for sportspeople who are healthy and those with a disease).
- **Virtual modelling**, **CAC (Computer-Assisted Cartography) approach, digital mannequins and numerical simulation** for ergonomic correction and design, applied to the improvement or creation of processes and products integrating human factors.

Skills

The skills acquired will enable graduates to provide expertise in the Sciences and Techniques of Physical Activities (physiology, biomechanics, Social and Human Sciences (SHS)) and engineering sciences and to respond in a structured way to ergonomic design and correction problems. The skills consist of:

- ability to use the knowledge and resources of the sciences and techniques of physical activity for the health, well-being and performance of a population with specific needs (gender, "ordinary" population, people with disabilities, ageing, population at risk),
- ability to organize human resources and the financial, administrative and material resources necessary for the development and implementation of a programme or action by identifying and mobilizing stakeholders and participating in the project management,
- analysis of the specific needs of an institution, individual or user group in a particular context, identifying issues through setting up a diagnosis, assessing and regulating its action, defining a provisional budget, setting up project monitoring, leading a working group,
- design, development, implementation and management of individual or collective physical activity programmes for preventing musculoskeletal disorders (MSD),, the promotion of health and well-being, in relation to the environment,
- knowledge of digital tools for virtual modelling and digital mannequins and the ability to ensure a technology watch (exoskeletons, cobotics, virtual reality, new measurement systems),
- mastery of technical and scientific English. Working in an international context (cultural openness, international experience),
- drafting of specifications, funding applications, testing and assessment protocols, observation specifications, study reports and the verification and organization of documentation for certification purposes or for the protection of products, services and equipment. Taking into account the constraints of competitiveness and productivity, innovation, intellectual and industrial property and compliance with quality, health and safety procedures.

Course Content

The general organization of the Master's programme is inspired by the EOPS and APAS Master's programmes for sharing the knowledge and skills common to the field of physical and sports activities.

Only the professional skills and modules directly related to ergonomics are specialized. They rely on the network of institutional and industrial partners of the area, the M2S laboratory, and technological platforms (Immermove room and functional exploration platform of the M2S laboratory). As a result, the classes take place on the Rennes campus and are organized in blocked weeks to allow a work-study system and promote continuing education.

Seminar days shared with the Master's Degree in Ergonomics and Psychology of Human Factors are organized at the end of the semester over half days or blocked days to create synergies between multidisciplinary approaches, tools and analytical methods. These seminars bring together all M1 and M2 students, that is between 45 and 50 students.