PEKÁR IMRE
GÉPÉSZETI TUDOMÁNYOK DOKTORI ISKOLA
H-4002 Debrecen, Ótemető u. 2-4.
e-mail: doktori@eng.unideb.hu
honlap: engphd.unideb.hu

Tantárgy megnevezése	**Robotics in Rehabilitation and Assistance**
Tantárgy típusa	kötelezően választható, angol nyelven
Tantárgyfelelős	Dr. Husam A. Almusawi
Tematika	The course covers the interdisciplinary field of robotics designed to assist human capabilities and enhance healthcare outcomes. the course delves into the fundamentals of robotics and biomedical signals, emphasizing the role of EMG, EEG, and Brain-Computer Interfaces (BCI) in developing assistive technologies. It explores the design, application, and impact of rehabilitation robotics in therapy and recovery, alongside the engineering behind prosthetic and orthotic devices, incorporating advanced materials and integration techniques for improved user control and experience. Moreover, this course focuses on rehabilitation robotics, prosthetic devices, and the control algorithms that make these innovations possible, such as PID controllers, fuzzy logic, neural networks, and adaptive control, along with machine learning for personalized assistance. The curriculum explores assistive systems for independent living, including wearable exoskeletons that use "assist-as-needed" strategies for tailored support. Through project-based learning, students will apply these control algorithms to develop practical solutions, preparing them for advancements in assistive technologies. Designed for engineering and robotics students, this course highlights control strategies' critical role in developing user-centric assistive solutions.
Irodalom	• Colombo, Roberto, and Vittorio Sanguineti, eds. "Rehabilitation robotics: Technology and application." (2018). • Johnson, Michelle Jillian, and Rochelle J. Mendonca, eds. Rehabilitation Robots for Neurorehabilitation in High-, Low-, and Middle-Income Countries: Current Practice, Barriers, and Future Directions. Elsevier, 2023.