COURSE DESCRIPTION CARD - SYLLABUS

Course name
Design of rehabilitation equipment [S2IBio1-UMiR>PUR]

Course

Field of study
Biomedical Engineering

Year/Semester
1/2

Area of study (specialization)
Medical and Rehabilitation Devices

Profile of study
general academic

Level of study
second-cycle

Course offered in
Polish

Form of study
full-time

Requirements
compulsory

Number of hours

Lecture
15

Laboratory classes
0

Other
0

Tutorials
0

Projects/seminars
15

Number of credit points

2,00

Coordinators

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Lecturers

Prerequisites

The student starting this course should have basic knowledge of the basics of machine construction, automation, programming, designing electronic systems, drives and sensors. Student should also have the ability to obtain information from the indicated sources and be ready to cooperate as part of the team.

Course objective

Acquiring by the student the ability to design rehabilitation devices such as mechanical construction, selection of automation elements, electrical diagram and program. Transfer of knowledge on the basics of rehabilitation devices construction. Development of programming skills, documentation and reading of technical documentation, practical use of knowledge gained during first-cycle studies, shaping teamwork skills.

Course-related learning outcomes

Knowledge:
1. Knowledge of the principles of theoretical description of static and dynamic properties of mechanical and electrical elements.
2. Knowledge of how to apply computer systems in the design of rehabilitation devices

3. Knowledge of the principle of mechatronic design

Skills:
1. Ability to design a mechtronic device
2. Ability to select automation elements for the designed rehabilitation device.
3. Ability to draw an electrical diagram
4. Ability to make a critical analysis of the functioning of a mechatronic device
5. Ability to obtain technical information
6. Ability to plan and carry out the process of constructing simple machinery or machines

Social competences:
1. Understands the need for lifelong learning; can inspire and organize the learning process of others
2. Can identify priorities for the implementation of a specific task
3. Can interact and work in a group
4. Can think and act in an entrepreneurial manner
5. Is aware of responsibility for his own work and readiness to submit to the principles of teamwork and responsibility for jointly performed tasks

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Project: Passing based on the rehabilitation device design. The project should include a theoretical description, mechanical model, electrical diagram, program and visualization. The condition for receiving a positive evaluation is obtaining at least 50% of the possible points.
Lecture: written test. The condition for receiving a positive evaluation is obtaining at least 50% of the possible points.

Programme content

Basic features and structures of rehabilitation devices.
Basic types of sensors and actuators used in rehabilitation devices
Basic graphic symbols used in the wiring diagram.
Creating an electrical diagram in the construction of rehabilitation devices.
Programming of industrial controllers in rehabilitation devices.
Creating visualizations in rehabilitation devices.

Course topics

Basic features and structures of rehabilitation devices.
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Teaching methods

Lecture: multimedia presentation and software application demonstration
Project: Project carried out by students under the supervision of the supervisor.

Bibliography

Basic 1. Dietrich M., Podstawy konstrukcji maszyn, WNT, 2008
2. Morecki A., Knapczyk J., Podstawy robotyki. Teoria i elementy manipulatorów i robotów. WNT, Warszawa
3. www.google.patents.com
Additional 1. Shetty D., Kolk R., Mechatronics System Design, PWS Publishing Company, Boston 1997

Breakdown of average student's workload

	Hours	ECTS
Total workload	50	2,00
Classes requiring direct contact with the teacher	30	1,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	20	1,00